Sea Grant
Law Center

Sea Grant Law & Policy Journal

Volume 5.2 Winter 2013

NSGLC-13-01-01

TABLE OF CONTENTS

Articles

Cover photograph of Norfolk, VA flood waters courtesy of the United States Navy.

Sea Grant Law Center

The Sea Grant Law & Policy Journal was prepared by the National Sea Grant Law Center under award NA090AR4170200 from NOAA, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the Sea Grant Law Center or the U.S. Department of Commerce.

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

Introduction to *Property, History & Climate Change in the Former Colonies Symposium* Special Issue

Jill Fraley[1]

The concept of property determines rights, often exclusive rights, to things. Within any given socio-legal system, models of ownership and theories of property evolve over time. With that said, one of the core components of the idea of property is its intractability. Vested interests prevent property from being malleable. In layman's terms, that means property is something you can count on. Economies depend on the reliability of property interests and the security of property is a major theme of political stability.

Culturally, the U.S. has tended toward a near worship of this aspect of property. Takings and eminent domain are among the few core constitutional concepts well understood by the general public. As the saying goes, a man's home is his castle. Within films and literature, the idea of taking away any unfettered right to property often plays villain to the ordinary citizen. While there is abundant evidence to the contrary, socio-culturally property is thought of in terms of exclusive rights and absolute dominion.

In recent years, legal theorists such as Margaret Jane Radin and Jeremy Waldron have affirmed these cultural beliefs by emphasizing the connection of property to individual freedom and the development of personhood. More than owning property, people may well be bounding themselves up within it—a sentiment that naturally supports the intractability of property rights.

On the other hand, property is not all about the individual. Theorists of property have long commented on the social nature of property. Property is better understood as a social system of distributing rights. Property relates to belonging, to social control, and to institutional authority. While property is possessed by small groups and individuals in many, if not most, circumstances, property serves greater social purposes.

The social approach to property weighs somewhat against the traditional rhetoric of vested, intractable rights. Historically, the ideas of exclusive rights and absolute dominion have often been abrogated in favor of greater social goods. An easy example is, of course, guaranteeing equal access to property to people of all races, ethnicities, and religions.

When it comes to climate change, these two histories are at odds. Many property doctrines date back centuries and leave us with vested interests that prevent property law from adapting to modern problems as rapidly as other areas of law do. Still, modern history demonstrates how greater social goods are capable of trumping the idea of unfettered individual control. In the near future, the challenge will be balancing these competing social goods, adjusting or maintaining theories and doctrines of properties while coping with the impacts of climate change, particularly on coastal properties. This symposium formed around the idea of bringing together legal theorists who focus on property with scientists who deeply understand the specific impacts that climate change brings in terms of impacts for land and landowners, and the planning implications for state and local governments.

The mid-Atlantic presents a global hot spot for climate change vulnerability and emerging adaptation needs. Governments are preparing for sea level rise and problems in shoreline management, along with the potential for unprecedented storms. This same region also boasts some of the most historical irregularities in terms of property law due to the long and experimental colonial period. Thus, the interface of property law and climate adaption is particularly relevant to the mid-Atlantic.

[1] Assistant Professor of Law and Director, Center for Law & History, Washington & Lee University School of Law.

This issue of the *Sea Grant Law and Policy Journal* begins with the article of Dr. Larry Atkinson, Professor of Oceanography at Old Dominion University, and Dr. Tal Ezer, a professor in Old Dominion University's Department of Ocean, Earth, and Atmospheric Sciences, which discusses sea level rise and how this phenomenon is being and will be experienced in Virginia. Virginia coastal cities are challenged today to plan for how to combat and address sea level rise to save coastal cities from flooding in the future. Dr. Atkinson and Dr. Ezer review the past history of sea level, the changes in sea level locally in the Norfolk/Virginia Beach region, and future predictions of sea level in the region. Figures and graphics illustrate how minor flooding, sometimes called nuisance flooding, has increased in the region in recent years. In addition, their article briefly reports on how some communities are planning their adaptation to sea level changes.

William Stiles, Molly Mitchell, and Troy Hartley provide an overview of the climate change adaptation policy, planning, and implementation landscape in Virginia on both the state and local level. Adaptation planning and policy action has arisen in Virginia from many drivers, including incentives from the federal, regional, and local level. The authors review some of the major adaptation initiatives and milestone events in Virginia's consideration of climate change. Although some Virginia localities have launched community engagement efforts focused on concerns over increased flooding risks, state-level engagement on the issue has been less consistent. The authors argue that this has left a leadership void on climate adaptation issues and created a challenging environment to align interests for broader regional responses.

Moving from the science to the problems brought on by the state's unique legal history, James Jennings and Erin Ashwell, both of the law firm Woods Rogers, discuss the issue of navigable waterways and private ownership of the river bottoms in Virginia. In particular, they highlight a conflict between a policy announced by a Virginia Attorney General's Opinion and the Virginia Marine Resources Commission that presumes state ownership of submerged lands with decisions of the Virginia Supreme Court recognizing some private ownership. Their article concludes by analyzing the criteria used by Virginia courts to determine ownership of streambeds and attendant rights in the encompassed waterways.

My own contribution focuses on a specific example of how property law poses unique challenges for climate change. Taking Virginia as an example, the article explains how an ancient type of land grant, called a King's grant, provided additional rights to waterways that later colonial grants did not include. As a result, Virginia has privately owned dams, some of which are categorized as high hazard dams. Rising water levels and high intensity storms in the coastal areas tax the resources of private owners who often have neither the funds nor expertise to face these challenges. Private ownership requires individuals to act in concert with government officials to control flooding in the event of significant storms; to date there are very limited and ad hoc agreements in place to deal with such scenarios. I suggest evaluating the possibility of state acquisition of dams, at least in instances where the dam could contribute to systematic control of a river.

This symposium issue of the *Journal* concludes with an article about the public trust doctrine. Blake Hudson, Associate Professor of Law at Louisiana State University and the LSU School of the Coast and Environment, highlights the legal tension between the Takings Clause and public trust doctrine and its implications for coastal zone resources in a time of climate change. His article explores what this tension means with respect to (1) the resolution of future legal controversies related to climate change along the coast; (2) a potential rebalancing of modern takings jurisprudence, which has arguably disturbed the appropriate balance between private property protections and the public good; and (3) the creation of better governance structures through institutional design enhancements and adjustments.

Sea Level Rise and Flooding Risk in Virginia

Larry P. Atkinson, Tal Ezer, and Elizabeth Smith[1]

Abstract: Consistent rises in sea level have occurred throughout the world for thousands of years. Flooding, storm surges, and other consequences of the rise in sea level have had widespread effects on coastal communities across the globe. Nowhere is this more apparent than the Norfolk/Virginia Beach region along the U.S. Atlantic coastline, where the sea level is rising more rapidly than the global average. This article discusses the causes of and the differences between the rise in sea levels globally and the rise of the sea level in the mid-Atlantic region of the United States. The article also emphasizes the problems and consequences this sea level rise is creating for the mid-Atlantic region and outlines how communities along the coast are responding in order to adapt to the ever-changing sea levels.

I. Introduction

Communities in the coastal areas from Norfolk to New York City were settled over 400 years ago. Since that time sea level has risen well over one foot and in many locations over two feet.[2] Because of the rise in sea level, communities see more frequent flooding from the same type of storms. Some communities now experience minor flooding even during normal high tides. This article reviews the past history of sea level, the changes in sea level locally in the Norfolk/Virginia Beach region, and future predictions of sea level in the region. This article also discusses and shows graphically how minor flooding, sometimes called nuisance flooding, has increased. In addition, this article briefly reports on how communities are planning their adaptation.

A. Changes in Global Sea Level

Sea level has been rising and falling in a regular pattern for at least 400,000 years. As a glacial cycle starts, ice forms over land and sea level drops as water is transferred from the ocean to land. When a glacial cycle ends, the land ice melts, water returns to the ocean, and sea level rises. This cycle repeats

[1] Larry P. Atkinson is Slover Professor of Oceanography and Director of the Climate Change and Sea Level Rise Initiative, Old Dominion University, Norfolk, VA (latkinso@odu.edu). Tal Ezer is Professor of Oceanography, Center for Coastal Physical Oceanography, Old Dominion University, Norfolk, VA (tezer@odu.edu). Elizabeth Smith is with the Climate Change and Sea Level Rise Initiative, Old Dominion University, Norfolk, VA (exsmith@odu.edu).

[2] *See* U.S. Geological Survey, The Chesapeake Bay: Geologic Product of Rising Sea Level, Fact Sheet 102-98 (Oct. 1998), *available at* http://pubs.usgs.gov/fs/fs102-98/?.

itself about every 100,000 years. This regular cycle is caused by changes in the earth's orbit and tilt in relation to the sun.

Global sea level also changes as the temperature of the oceans' waters change. As the oceans warm, as they are now, they expand. The expansion caused by warming results in sea level rising because a very small increase in temperature can cause a large increase in the sea level because the ocean is on average several miles deep. The warming and consequent expansion of the ocean and the addition of melting land ice over Greenland and the Antarctic result in the sea level rise (SLR) currently being observed by scientists, communities, and property owners.

Since the last glaciation ended about 18,000 years ago, global sea level has risen about 400 feet as the oceans have warmed and ice has melted. It is important to note that over the last 6,000 years sea level rise has been relatively slow. Interestingly, the last 6,000 years of slow sea level rise corresponds with the time period in which many civilizations grew in the coastal areas of the Middle East.

Since the late 1800's tide gauge measurements, which are now combined with satellite altimetry (since about 1993), give a more detailed picture of global sea level rise (Figure 1). Even a casual look at the plot in Figure 1 suggests an increasing rate of global sea level rise. The variation that occurs every ten years or so is related to ocean processes such as el Niño and la Niña. Excellent reviews of the physics of sea level rise and adaptation can be found in the June 2011 special issue of the journal *Oceanography*.[3] In addition, a very recent assessment of global sea level rise with reference to the U.S. coastline was recently published by the National Oceanic and Atmospheric Administration.[4]

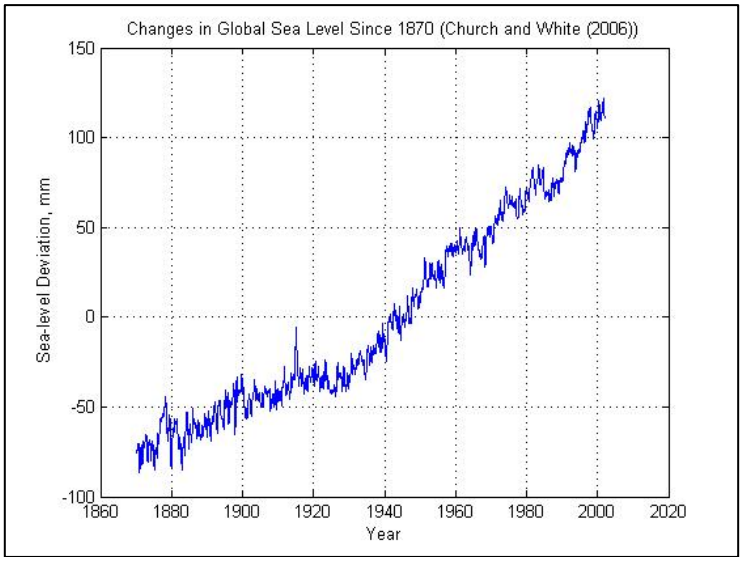

Fig. 1. Global sea level. Global average sea level from coastal tide gauges.[5]

B. Local or Relative Sea Level Rise

The global sea level changes that are often referred to in the press are frequently very different from the actual sea level rise at any coastal location. Local sea level changes are measured at tide

[3] The articles from this special issue can be accessed at http://www.tos.org/oceanography/archive/24-2.html.

[4] A. PARRIS ET AL., GLOBAL SEA LEVEL RISE SCENARIOS FOR THE US NATIONAL CLIMATE ASSESSMENT, NOAA TECH. MEMO OAR CPO-1 (Dec. 2012), *available at* www.cpo.noaa.gov/reports/sealevel/NOAA_SLR_r3.pdf.

[5] Data derived from John A. Church and Neil J. White, *Sea-level rise from the late 19th to the early 21st Century*, 32 SURVEYS IN GEOPHYSICS 585 (2011), *available at* http://link.springer.com/article/10.1007/s10712-011-9119-1.

gauge stations maintained by the U. S. Government (Figure 2). These gauges are critical to determining the present rise rates and predicting the future rates of sea level rise. The Sewells Point gauge is on the Norfolk Naval Base and has been making measurements since 1928 (Figure 3). That is one of the longer records in the U.S. and is almost iconic for SLR in Virginia. Data from this gauge shows a rise rate of about 1.5 feet per 100 years or about 2 inches per decade over the past decades. This may not sound like much, but recall that Hampton Roads and many coastal areas along the Gulf, southeast, and northeast coasts are very flat with little elevation changes within a few tens of miles of the shore.

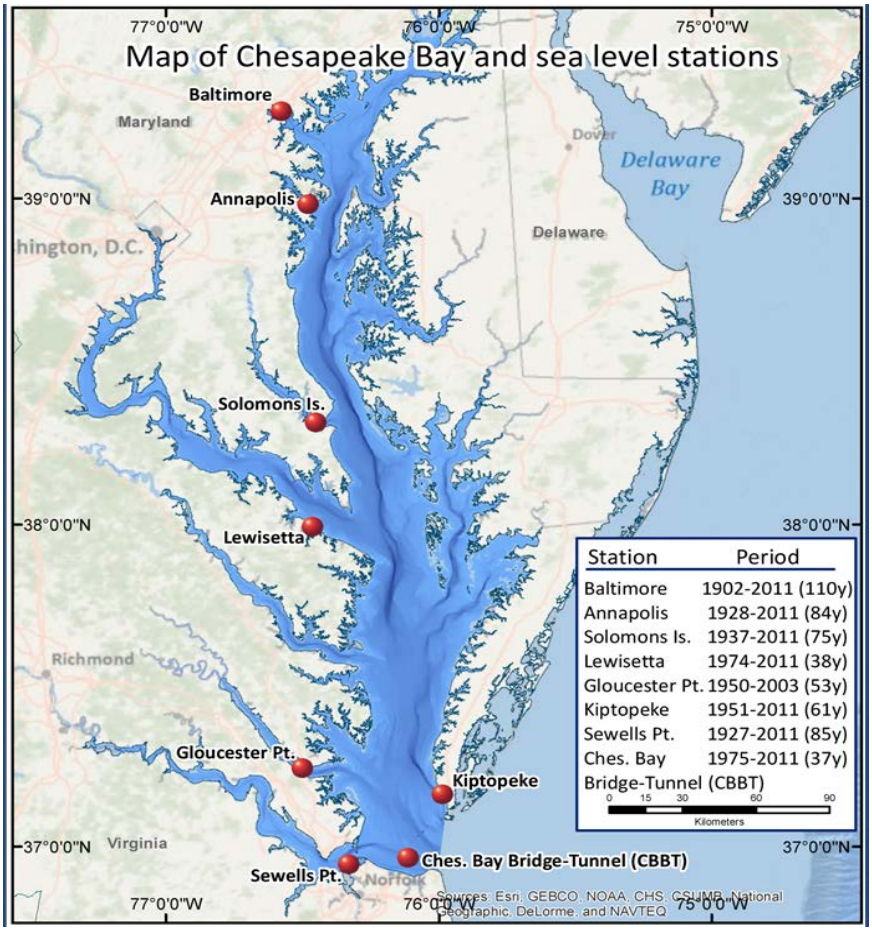

Fig. 2. Chesapeake Bay map showing tide gauge stations. Note location of Sewells Point gauge in Norfolk, VA. Prepared by G. McLeod (Old Dominion University).

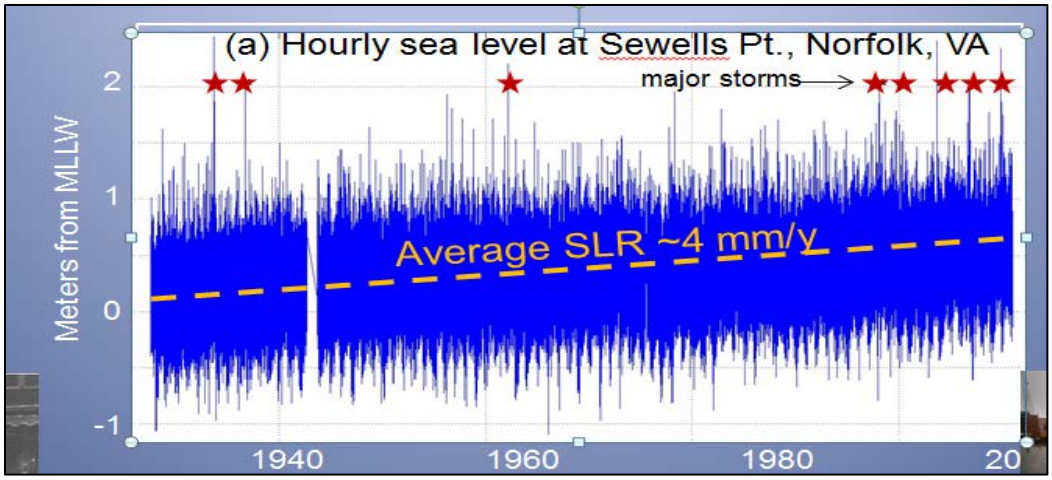

Fig. 3. Sea level trends in Norfolk. This figure shows the water level height at the Sewells Point NOAA tide station in Norfolk. The average sea level rise since 1928 has been about 1.45 feet. Major flooding events because of hurricanes or northeasters are indicated with stars.

The local SLR in the mid-Atlantic is higher than the global rise for several reasons. First, there is local subsidence. In the mid-Atlantic, the land is sinking because of compaction related to the nature of the underlying rock including the presence of the Chesapeake Bolide[6] and groundwater withdrawal. Additionally, over the years many structures have been built on fill that compacts, leading to local sea level rise. Second, there is glacial isostatic rebound or glacial forebulge subsidence. During the last glaciation the earth crust under the ice in the northeast U.S. and Canada was depressed and the crust below Virginia rose. Now, with the ice removed, the northeast U.S. and Canada is rising and the crust below Virginia is sinking.[7] Third, local sea level rise in the mid-Atlantic is higher because of ocean circulation dynamics. The North Atlantic Ocean is not level. For example, when the Gulf Stream current flows northward along the coast, it has an east-west tilt in elevation of about 3-5 feet across its flow, keeping the sea level along the U.S. East Coast lower than the rest of the Atlantic Ocean east of the stream (imagine a dome of water sitting in the North Atlantic Ocean, but as the dome expands, contracts or shifts onshore/offshore the boundary of the dome laps up on the U.S. coastline). What might be minor relative to the size of the North Atlantic Ocean is significant for the U.S. coastlines. As discussed later, climatic changes in the North Atlantic Ocean circulation and weakening of the Gulf Stream may cause an acceleration of sea level rise along the mid-Atlantic coast.

C. Global vs. Local Sea Level

As discussed, global sea level rise is different than local sea level rise. Consider the comparison of global SLR to local SLR in the Hampton Roads area. Figure 4 shows the height of global sea level from satellite measurements (red monthly average and linear trend line) compared to the height of local sea level from a tide gauge in Hampton Roads (blue monthly average and linear trend line). The recent report for the National Assessment states for global sea level rise: "We have very high confidence (>9 in 10 chance) that global mean sea level will rise at least 0.2 meters (8 inches) and no more than 2.0

[6] *See* C. Wylie Poag et al., *Meteoroid Mayhem in Ole Virginny: Source of the North American Tektite Strewn Field*, 22 GEOLOGY 691 (1994).

[7] *See* Timothy W. Scott et al., *Glacioisostatic Influences on Virginia's Late Pleistocene Coastal Plain Deposits*, 116 GEOMORPHOLOGY 175 (2010).

meters (6.6 feet) by 2100."[8] The local Hampton Roads data (blue line) varies almost 2 feet month-to-month because of seasonal temperatures, wind patterns, and ocean circulation. Note that the local sea level rise in Hampton Roads is more than twice as fast as the global sea level rise. Again, this is because of local subsidence and ocean circulation in the nearby ocean.

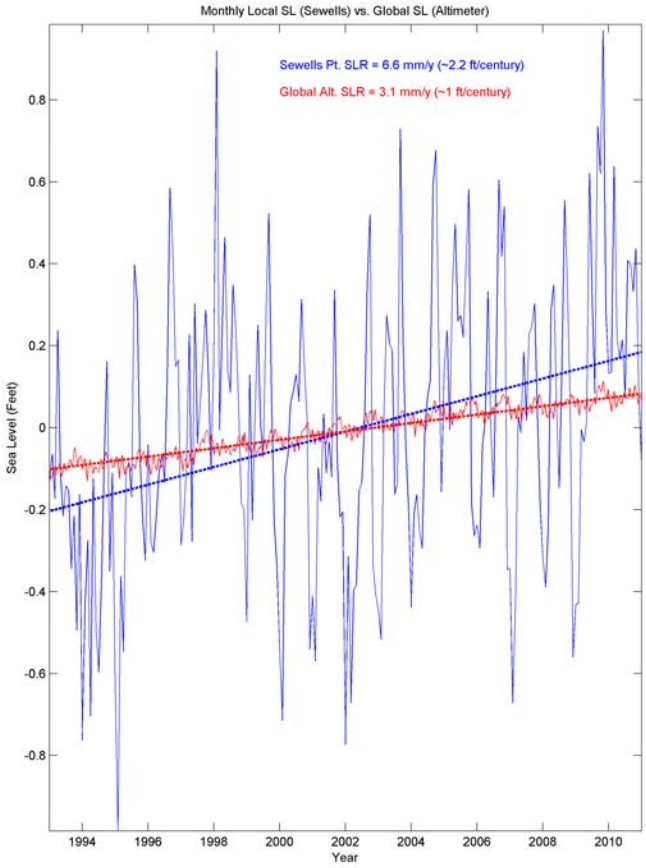

Fig. 4. Global and local sea level trends and local variability. This figure shows the global rise in sea level (red variable line), the global trend (red straight dashed line), local sea level (blue variable line), and local sea level trend (straight blue dashed line).

II. Sea Level Rise, Storm Surge, and Flooding

As there is often some confusion about what kind of flooding is being discussed, some definitions (all unofficial) are in order.

- Global sea level rise: this refers to the slow rise of the average sea level of all the oceans because of ocean warming and land ice melting over decades and centuries.

- Relative or local sea level rise: this refers to the level of the ocean relative to a landmark in a specific location. For example, in Hampton Roads sea level is rising at a rate of at least 2 inches every 10 years when measured from a dock on the Navy base. In Finland, the opposite is

[8] Parris, *supra* note 4, at 1.

happening. Because of glacial isostatic rebound, the land is rising and local sea level is dropping there. Relative or local sea level is what anyone working on coastal issues must be aware of.

- Storm surge: this refers to flooding caused by the winds and low barometric pressure associated with storms such as hurricanes or northeasters. These storms push water toward the shore, raising the water level on the coast. Over a period of hours or days water floods onshore into areas that are not normally flooded with salt water. For example, a passing storm may cause the ocean in Hampton Roads to be 3 feet above what would normally be expected from the tide. Thus the storm surge is 3 feet. Local sea level rise means that 10 years from now the same storm would result in a 3-foot and 2-inch rise (approximately).

- Flooding: this refers to flooding due to rain or rivers. When a heavy rain occurs at the same time as a storm surge there is no place for the rainwater to drain to and a locale can have both storm surge flooding and rain flooding.

- Tides: the regular ebb and flow of the tides (semi-diurnal tide every 12 hours 25 minutes and diurnal tide about every 24 hours) does not normally cause unexpected flooding. When a high tide coincides with a storm surge, the storm surge flooding will be worse.

- Tidal flooding: this often refers to storm surge flooding but really just means being flooded by saltwater during normal tides. The tides go in cycles such that about every two weeks (during full moon and new moon) there are higher tides (called "spring tides").

- Tsunami wave flooding: this refers to the flooding by a tsunami which is caused by undersea earthquakes that causes a very long wave to propagate toward the shore where it increases dramatically in height.

III. Recent Local Sea Level Rise Acceleration and the Future of Local SLR

Up until this point in the discussion, the sea level rise rate has been assumed to be constant. That is, for example, one foot every 100 years. Some very new studies, however, indicate that sea level is not just rising, but in the mid-Atlantic region is actually accelerating. That means that every year the rise is a little bit faster than the year before. For example, if sea level is rising 0.2 inches this year (about 5 mm/y), but in the following year sea level is rising by 0.21 inches (about 5.3 mm/y), SLR would be accelerating by 0.01 inches per year per year (or about 0.3 mm/y^2). Over time, SLR acceleration will result in a much higher future sea level than if sea level will continue rising at a constant rate.

Sea level in the future must be predicted so engineers can effectively design structures such as storm drains, docks, and other coastal structures. Predicting local sea level out 10 to 20 years can be done with reasonable accuracy by simple linear extrapolation from existing trends. However, many projects require knowing sea level out 20 to 150 years. Those predictions depend on different climate change scenarios.

Interestingly, in late 2012, three papers have been published (and more submitted) that examine the rate of sea level rise and show that it is accelerating. Following are key quotes from those papers:

- Sallenger et al. (2012) stated that "Our analyses support a recent acceleration of SLR on 1,000 km of the east coast of North America north of Cape Hatteras. This hotspot is consistent with SLR associated with a slowdown of AMOC [Atlantic Meridional Overturning Current.]"[9]

- Ezer and Corlett (2012) stated that "The analysis shows that most sea level records in the Chesapeake Bay have significant positive SLR acceleration, so the SLR rates today are about twice the SLR rates of 60 years ago."[10]

- Boon (2012) stated "Evidence of statistically significant acceleration in sea level rise relative to land is found in a recent analysis of monthly mean sea level (mmsl) at tide stations on the Atlantic coast of North America."[11]

The future rise of sea level depends partly on the momentum in the system right now and partly on future greenhouse gas emissions that cause warming of the ocean. Ezer and Corlett[12] show sea level rise at different locations in the Chesapeake Bay and calculate projections for different scenarios, for example, whether SLR acceleration is included or not. (Figure 5). The Sewells Point location can expect about 2.5 feet of rise by 2100. This is similar to the recommended guidance from the Virginia Commission on Climate Change.

[9] Asbury H. Sallenger, Jr., Kara S. Doran, and Peter A. Howd, *Hotspot of Accelerated Sea-Level Rise on the Atlantic Coast of North America,* 2 NATURE CLIMATE CHANGE 884, 884 (2012).

[10] Tal Ezer and William Bryce Corlett, *Is Sea Level Rise Accelerating in the Chesapeake Bay? A Demonstration of a Novel New Approach for Analyzing Sea Level Data*, 39 GEOPHYSICAL RESEARCH LETTERS L19605 (2012), *available at* http://onlinelibrary.wiley.com/doi/10.1029/2012GL053435/full.

[11] John D. Boon, *Evidence of Sea Level Acceleration at U.S. and Canadian Tide Stations, Atlantic Coast, North America*, 28 J. COASTAL RESEARCH 1437, 1437 (2012), *available at* http://www.jcronline.org/doi/pdf/10.2112/JCOASTRES-D-12-00102.1.

[12] Tal Ezer and William Bryce Corlett, *Analysis of Relative Sea Level Variations and Trends in the Chesapeake Bay: Is there Evidence for Acceleration in Sea Level Rise?*, IEEE Xplore Paper # 2478367, MTS/IEEE Oceans '12 (2012), *available at* www.ccpo.odu.edu/~tezer/PAPERS/2012_MTS-IEEE_SLR.pdf.

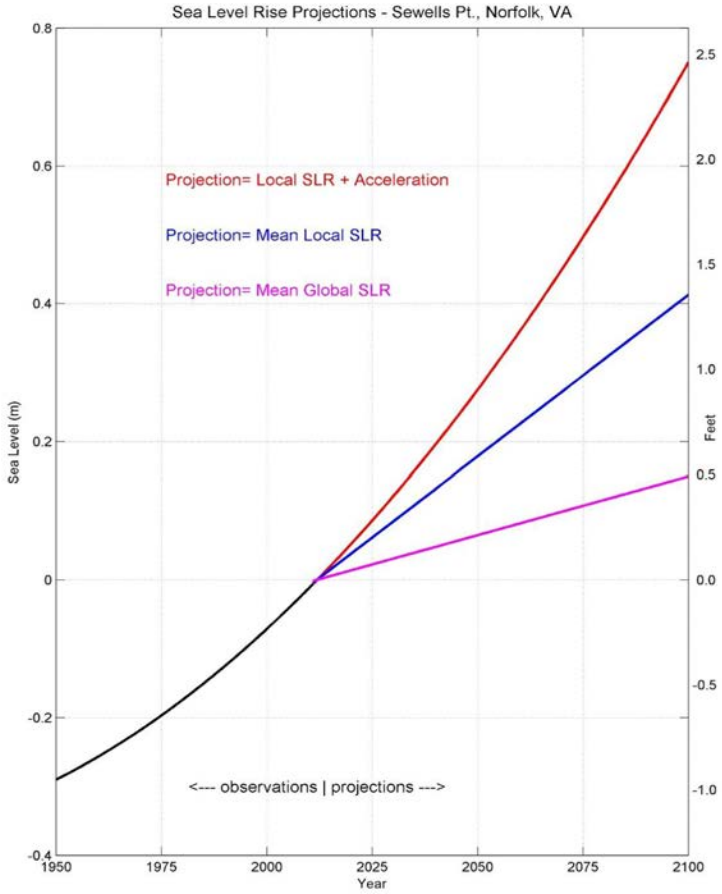

Fig. 5. Future sea level heights. This figure shows projected sea level heights based on the work of Ezer and Corlett. The purple lower curve is a projection using the current global sea level rise rate. The blue (middle) curve is the projection using the current rise rate at Sewells Point. The red (top) curve shows the projection based on the measured present acceleration at Sewells Point. The estimate of 2.5 feet of rise by 2100 is in the range of many other studies.

This local rise rate is nearly the highest rise rate seen anywhere in the U.S. The causes of the increased sea level rise rate, as previously noted, are warming and expanding ocean water, ground subsidence because of local geology and glacial rebound. A final and important factor is called dynamic sea level change caused by changes in the Gulf Stream. Recent studies suggest this "dynamic ocean circulation" factor, and in particular a climate-related weakening of the Gulf Stream, is causing the acceleration.[13] Future sea level rise is expected to be at least 2.3 and possibly as high as 5.2 feet by 2100.

The recent report for the U.S. National Assessment makes the following recommendation for the mid-Atlantic region:

> ... the observed rates of [relative sea level] rise and the evidence presented by Sallenger et al (2012) and more recently by Boon (2012) are sufficient to suggest that experts and decision

[13] Tal Ezer et al., *Gulf Stream's induced sea level rise and variability along the U.S. mid-Atlantic coast*, J. OF GEOPHYSICAL RESEARCH, 118(2): 685-697 (2013), *available at* http://onlinelibrary.wiley.com/doi/10.1002/jgrc.20091/full.

makers may consider accelerated rates along the northeastern stretch of coast into their risk-averse, worst-case scenarios.[14]

IV. Local Effects of SLR

What does this rise rate mean to low lying communities like Norfolk, Virginia at the mouth of the Chesapeake Bay and facing the Atlantic Ocean? How does SLR affect residents of Norfolk and surrounding cities? The effect is most easily visualized by looking at how many hours a specific part of the region is flooded each year. A historic district neighborhood in downtown Norfolk called "The Hague" regularly has flooded streets. The number of hours per year that this site is flooding was determined by comparing the tidal height when it floods to the corresponding height at a nearby tide gauge (Sewells Point). Figure 6 shows the exponentially increasing hours per year that this neighborhood is experiencing flooded streets. Floods that in the past were only caused by unusually strong storms are now often happening during a little above normal high tide.

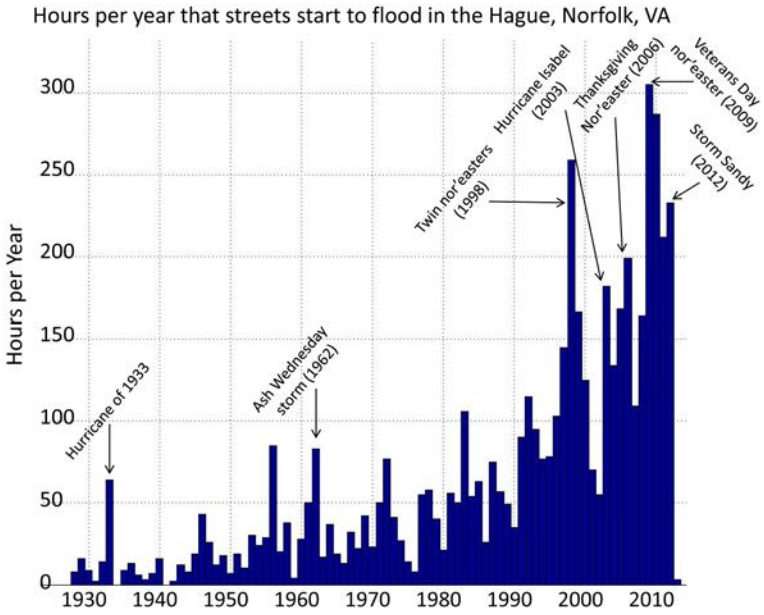

Fig. 6. Street flooding example. This figure shows the hours per year that there is street flooding in the Hague section of Norfolk. There is a clear trend of more street flooding with around 100 hours per year now.

A second way to look at this is estimating when a street will be flooded at every spring high tide. Hampton Boulevard at a location between Old Dominion University and the Norfolk Navy base has a spot that routinely is flooded by saltwater from the nearby Lafayette River (a tidal river). Flooding occurred at about 4.5 feet above MLLW (Mean Lower Low Water) at Sewells Point. Figure 7 shows the extrapolation of higher tides into the future. Note that the sloping projection of higher water will be above 4.5 feet in about 2040. That means that twice a day for an hour or so tens of thousands of commuters will drive through saltwater, if they can drive at all.

[14] Parris, *supra* note 4, at 10.

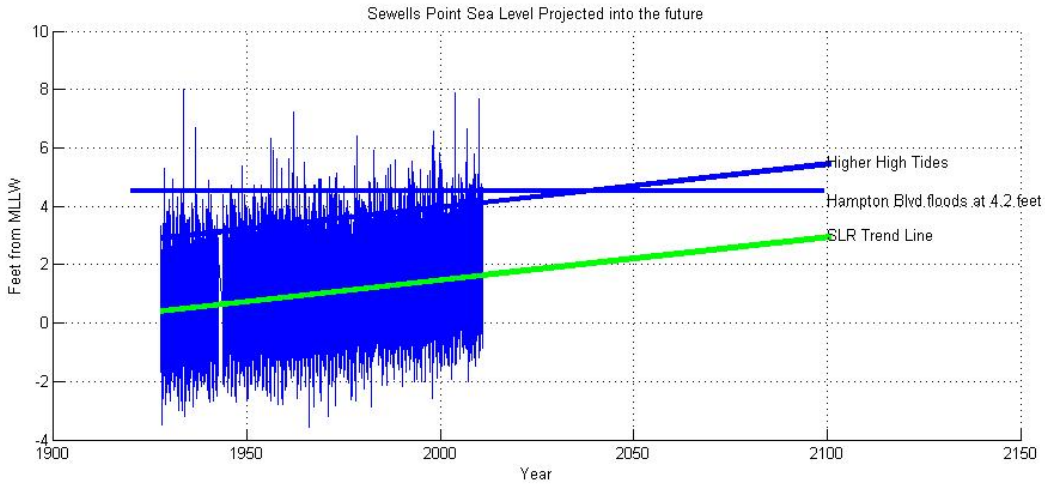

Fig. 7. Example of future street flooding. This figure shows the trend in sea level rise at Sewells Point. The street will be flooding every high tide by 2050.

V. Communities Adapting

There are many reports of potential damage from storm surge. Storm surge is the higher waters that occur when a storm such as a hurricane or northeaster pass northward along the Virginia coast. A 2011 report by Core Logic estimated 289,000 properties with a value of $45 billion are at risk to damage from storm surge in the Hampton Roads area.[15] This is very high compared to other densely populated cities in the U.S.

Coastal communities are developing adaptation plans, having moved well beyond the questions "Is it changing?" or "Why is it changing?" Vulnerable communities have made the transition to asking "Can society (*i.e.,* human beings) manage the changes, avoid the unmanageable, reduce vulnerability, and enhance resilience in order to sustain a way of life on the coast?" How residents of coastal communities respond and react will be critical. Rosina Birnbaum and co-authors recently published a comprehensive review of climate adaptation, not specific to sea level rise, "to understand what types of adaptation activities are underway across different sectors and scales throughout the country."[16] Birnbaum's paper is a resource and not meant as a critical review of adaptation efforts; however, it is a valuable compilation of illustrative adaptation activities happening across the United States.

Understanding human behavior, individual as well as collective/community behavior, will be the key to developing adaptation strategies that become "best practices." There is considerable uncertainty about the exact nature of the changes, in terms of ranges of SLR over decades. This uncertainty should not be a rationale for inaction or a barrier to adaptation[17] and understanding how humans behave in the face of uncertainty will facilitate communicating about adaptation and implementing adaptive strategies.

Sea level rise adaptation planning is underway, though on a steep learning curve, in Virginia. A solid, "bottom-up" approach is to build from communities' existing Hazard Mitigation Plans.

---

[15] CORELOGIC, 2011 CORELOGIC STORM SURGE REPORT: RESIDENTIAL STORM-SURGE EXPOSURE ESTIMATES FOR 10 U.S. CITIES 26 (2011), *available at* http://www.corelogic.com/about-us/research.aspx.

[16] Rosina Birnbaum et al, *A Comprehensive Review of Climate Adaptation in the United States: More than Before, but Less than Needed*, MITIGATION AND ADAPTATION STRATEGIES FOR GLOBAL CHANGE (Sept. 18, 2012), *available at* http://link.springer.com/article/10.1007%2Fs11027%E2%80%90012%E2%80%909423%E2%80%901.

[17] *See* NATIONAL RESEARCH COUNCIL, ADAPTING TO THE IMPACTS OF CLIMATE CHANGE (2010), *available at* http://www.nap.edu/catalog.php?record_id=12783.

Unfortunately, the issue has been highly politicized which has made a regional or state approach difficult. The Virginia Institute of Marine Science (VIMS) was funded by the General Assembly in May 2012 to synthesize and report on the effects of climate change and SLR on the state's coastlines.[18] The specific goals of the VIMS "Recurrent Flooding Study" are to:

- Review and develop a comprehensive list of strategies for dealing with recurrent flooding;
- Convene a stakeholder advisory panel; and
- Offer specific recommendations on options for sea level rise adaptation which merit investigation.

This report will support and recommend mapping of storm surge and flood frequency, at high resolution, as essential to identifying vulnerabilities in populations, infrastructure, and natural resources. GIS-based mapping can also identify where resources could have the biggest impact.

Adaptation plans will vary within Virginia because the local sea level rise rates vary considerably and the coast varies from industrialized to remote wetlands. Categories of adaptation include:

- Management, through laws like the Coastal Barrier Resources Act;
- Accommodation, by raising houses for example; and
- Protection, through hardened (tide gates, walls, barriers) or soft (living shorelines, wetlands restoration) structures.

In urban centers like Norfolk, new development increases the consequences of flooding. As lower risk areas are built out, higher and higher risk areas are developed. A result is the reduction in natural areas, which increases the extent of flooding and removes any potential natural (*i.e.,* soft) protection. Protection-type projects are under consideration in the city of Norfolk, with detailed design plans for a number of vulnerable locations in the city. However, the cost is high for these types of protections.[19] Figure 8 shows an example of a raised home in Norfolk.

Fig. 8. Flooding in the Lafayette River area.

[18] MOLLY MITCHELL ET AL., RECURRENT FLOODING STUDY FOR TIDEWATER VIRGINIA, VIRGINIA SENATE DOCUMENT NO. 3 (2013), *available at* http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf.

[19] *See generally*, engineering reports completed for the City of Norfolk's Environmental Storm Water Division of Public Work, *available at* http://www.norfolk.gov/publicworks/SW/SWEStudies.asp.

Norfolk has a comprehensive "Flooding Strategy" which emphasizes, among other things, planning, preparation, mitigation and communication and outreach to insure its citizenship is prepared.[20] Norfolk, however, is only one of sixteen localities that comprise the Hampton Roads Planning District Commission (HRPDC).[21] HRPDC is assisting in organizing the response planning of the entire Hampton Roads region.

As stated in a recent HRPDC report on sea level rise:

> Which adaptation strategies are most appropriate will depend on both the resources available to localities and the amount and character of existing developments. Sea level rise also poses challenges for the implementation of regulatory programs and laws, such as the Chesapeake Bay Preservation Act and its associated regulations, wetlands protection, floodplain management, and hazard mitigation efforts. These programs provide potential opportunities for localities to adapt to sea level rise within the existing regulatory framework.[22]

In rural, or low development areas, of Hampton Roads, houses are spread out which makes it challenging to provide protection over a large area. In these areas, citizen income is frequently linked to water access so retreating is problematic. In agricultural areas, saltwater intrusion can destroy crops. Finally, ecotourism makes hard engineering (walls, gates, breakwaters) unattractive.

Each city in the region has its own adaptation plans. This may range from changes in building codes to periodic upgrades to storm water pumping stations. The city of Norfolk has contacted several companies to assess the options the city has for adaptation. The report shows that a mix of tidal barriers that are both solid and inflatable would be suitable for some locations.

VI. Conclusion

Coastal communities, both urban and rural, have dealt with coastal flooding for centuries and will continue adapting for the coming centuries. Now sea level is rising more rapidly and the threat will only increase. The legal property issues will be significant and will affect the way communities adapt. In addition to the scientific studies of climate change and sea level rise, an important issue is communicating the scientific results and the nature of increased coastal flooding threat to the public and to decision makers.

---

[20] *See* City of Norfolk, Flooding Strategy, http://www.norfolk.gov/flooding/flooding_strategy.asp (last visited Jan. 11, 2012).

[21] Hampton Roads Planning District Commission, http://www.hrpdcva.gov/ (last visited Jan. 11, 2012).

[22] BENJAMIN J. MCFARLANE, HAMPTON ROADS PLANNING DISTRICT COMMISSION, CLIMATE CHANGE IN HAMPTON ROADS: PHASE III: SEA LEVEL RISE IN HAMPTON ROADS, VIRGINIA 2 (2012).

The Policy Climate for Climate Change in Virginia: Overview of Adaptation Policy, Planning and Implementation Landscape

William Stiles, Molly Mitchell, and Troy Hartley[1]

Abstract: Eastern Virginia is experiencing the highest measured rates of relative sea level rise on the U.S. Atlantic coast. At the same time, Virginia's coastal zone has a strong water-dependent economy, with port facilities, coastal transportation, shipbuilding and repair, and ocean-based tourism contributing billions of dollars annually to the state's economy. Sustaining this economic activity will require adapting to changes wrought by sea level rise. The adaptation policy landscape in Virginia is evolving rapidly, as illustrated through an examination of local, state, and federal concerns; local and state adaptation actions; and key milestones that have shaped perceptions and attitudes in Virginia. However, Virginia faces an implementation gap, between overarching plans and guidance acknowledging climate change concerns, and the concrete ordinances, codes, and other measures to address those concerns. The pathways forward are multi-faceted with opportunities for action, leadership, and collaboration from the local, regional, state, and federal level.

I. Introduction

As other papers in this special issue attest, eastern Virginia is experiencing the highest measured rates of relative sea level rise on the Atlantic Coast, causing many Tidewater localities to see more frequent and more extensive flooding events. Measured rates of sea level rise have averaged 3.6 to 7.0 mm per year (1.18 to 2.30 feet per century) in Virginia's lower Chesapeake Bay region. Increases in this measured rate have been projected in recent scientific publications.[2]

[1] William Stiles is the Executive Director of Wetlands Watch. Molly Mitchell is a Marine Scientist with the Center for Coastal Resource Management, Virginia Institute of Marine Science, College of William & Mary. Troy Hartley is Research Associate Professor and director of Virginia Sea Grant at the Virginia Institute of Marine Science, and the Thomas Jefferson Program on Public Policy, College of William & Mary.

[2] *See* John D. Boon, *Evidence of Sea Level Acceleration at U.S. and Canadian Tide Stations, Atlantic Coast, North America*, 28 J. COASTAL RESEARCH 1437, 1437 (2012), *available at* http://www.jcronline.org/doi/pdf/10.2112/JCOASTRES-D-12-00102.1; Tal Ezer and William Bryce Corlett, *Is Sea Level Rise Accelerating in the Chesapeake Bay? A Demonstration of a Novel New Approach for Analyzing Sea Level Data*, 39 GEOPHYSICAL RESEARCH LETTERS L19605 (2012), *available at* http://onlinelibrary.wiley.com/doi/10.1029/2012GL053435/full.

With more than 60% of the Commonwealth's population living in the twenty-nine counties and seventeen cities that comprise "Tidewater Virginia,"[3] sea level rise is arguably the most critical component of climate change affecting Virginia today. Virginia's coastal zone has a strong water-dependent economy, with port facilities, coastal transportation, shipbuilding and repair, and ocean-based tourism contributing billions of dollars annually to the state's economy. (Fig. 1). Sustaining this economic activity will require adapting to changes wrought by sea level rise.

Local governments in Tidewater Virginia have generally acknowledged sea level rise in planning documents, such as long-range comprehensive plans, floodplain management plans, and hazard mitigation plans,[4] but tangible adaptation actions are uncommon, *ad hoc*, and at a small scale. This paper reviews the evolving adaptation policy landscape in Virginia, through an examination of local, state, and federal concerns, local and state adaptation actions, and key milestones that have shaped perceptions and attitudes in Virginia. It ends with a brief discussion of Virginia's pathways forward.

Fig. 1. Virginia's coastal zone. Graphic courtesy of Virginia Department of Environmental Protection.

[3] "Tidewater Virginia", as defined in VA. CODE ANN. §28.2-100, "means the following counties: Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, New Kent, Northampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland, and York; and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach, and Williamsburg."

[4] See examples listed in Table 2, pg. 25.

II. Commonwealth of Virginia—Local, State & Federal Governments with Climate Concerns

Although state and federal governments play a major role in facilitating adaptation planning, most coastal adaptation will be implemented at the local level. Local governments are the primary actors charged with making the critical, basic land-use and public investment decisions and with working with community stakeholder groups to implement adaptation measures on the ground.[5] There are many drivers of local government action.

The overwhelming majority of land along Virginia's shoreline is privately owned and decisions on its use lie with local governments and landowners. Localities also play an important role in the implementation of a range of federal and state programs, including transportation to community development and emergency management that will be critical in developing climate change adaptation strategies in Virginia, especially those addressing sea level rise.

The Commonwealth of Virginia is a Dillon Rule state, with provisions in the state constitution limiting local government authorities. Virginia courts have held, "municipal governments have only those powers which are expressly granted by the state legislature, those powers fairly or necessarily implied from expressly granted powers, and those powers which are essential and indispensable."[6]

Myriad state agencies administer laws, develop regulations, conduct enforcement actions, and develop policies addressing coastal zone resources, including:

- *Tidal and Non-tidal Wetlands*: Virginia Department of Environmental Quality (VADEQ), Virginia Marine Resources Commission (VMRC), along with local Wetlands Boards.
- *Fisheries*: VMRC and Virginia Department of Game and Inland Fisheries (VA DGIF)
- *Subaqueous Lands*: VMRC
- *Dunes and Beaches*: VMRC and local Wetlands Boards
- *Point Source Air Pollution*: VADEQ
- *Nonpoint Source Water Pollution*: Virginia Department of Conservation and Recreation (VADCR) and local governments
- *Shoreline Sanitation*: Virginia Department of Health (VADH)
- *Coastal Lands:* VADCR

However, the tidal zone in particular contains overlapping and at times ambiguous authority and jurisdiction. Figure 2 illustrates that complexity in Virginia's multi-jurisdictional coastal context.

[5] VIRGINIA BURKETT AND MARGARET DAVIDSON, EDS, COASTAL IMPACTS, ADAPTATION AND VULNERABILITY: A TECHNICAL INPUT TO THE 2012 NATIONAL CLIMATE ASSESSMENT, COOPERATIVE REPORT TO THE 2013 NATIONAL CLIMATE ASSESSMENT 104 (2012), *available at* www.coastalstates.org/wp-content/uploads/2011/03/Coastal-Impacts-Adaptation-Vulnerabilities-Oct-2012.pdf.

[6] Commonwealth v. County Board of Arlington County, 232 S.E.2d 30, 40 (1977).

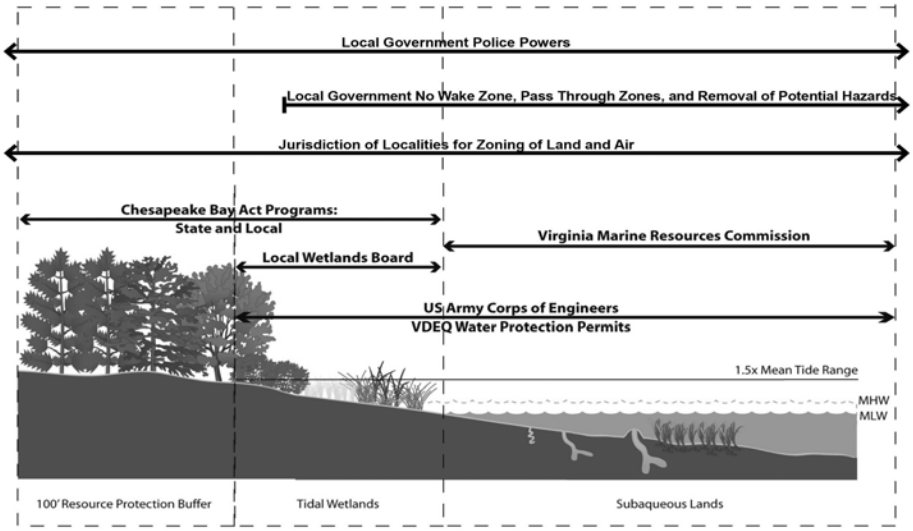

Fig. 2. Virginia legally defined shoreline resources and the relevant local, state, and federal authorities. Note that some authorities cross resource boundaries and most resources have a least two responsible regulatory authorities. Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/). University of Maryland Center for Environmental Science.

Further, Virginia's coastal zone has a substantial federal facility presence. (Fig. 3). The sixteen municipalities of the Hampton Roads region within the Virginia coastal zone contain the second largest concentration of military capacity and activities in the U.S. Over 40% of the region's economic activity comes from the combined military and other federal activities.[7]

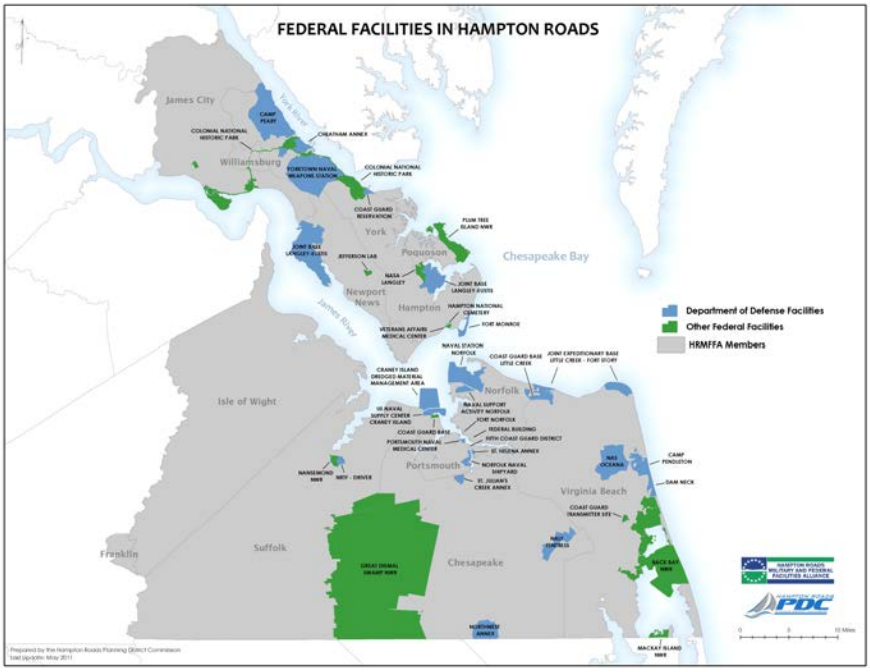

Fig. 3. Military Facilities in Hampton Roads. Image courtesy of the Hampton Roads Military and Federal Facilities Alliance.

[7] HAMPTON ROADS MILITARY AND FEDERAL FACILITIES ALLIANCE, REFERENCE GUIDE 3 (March 2009), *available at* http://www.hrmffa.org/images/stories/alliance_only/Documentation/2009_Reference_Guide.pdf.

Thus, there is a complex local, state, and federal government mosaic of jurisdiction and authority over various elements of climate adaptation planning and policy implementation. The Virginia Coastal Zone Management (VACZM) program, discussed further below, provides an overarching coordinating mechanism for the state agencies through an Executive Order which is renewed under each new Governor.[8]

III. Virginia's Adaptation Planning and Policy Action

Adaptation planning has arisen in Virginia from the increased flooding experienced by coastal zone localities. Localities along Virginia's tidal shoreline have seen higher storm surges, higher "spring" and astronomic tides, compromised transportation segments, and inundation to public and private properties among other impacts. Starting in 2008, Tidewater localities began to include sea level rise in local long-range land use planning documents, floodplain and hazard mitigation planning documents, and the like. These and other planning efforts are accelerating and some of those initiatives and examples are reviewed below.

A. Federal Incentives for Local Action

Many federal programs require local and regional governmental planning prior to participating in these programs, especially if they involve the distribution of federal funds. These federally mandated planning processes offer an opportunity for innovative communities to explore sea level rise impacts, even with limitations of local powers under the Dillon Rule.

In order for a locality in Virginia to be eligible for programs under the Federal Emergency Management Agency (FEMA), a community must undertake hazard mitigation planning.[9] The community must also have a floodplain management program and appropriate building ordinances in high-risk flood zones in order to qualify for the National Flood Insurance Program (NFIP).[10] The Virginia Department of Conservation and Recreation is the lead state agency on floodplain management planning.[11]

These prerequisites to participating in FEMA programs present opportunities for local governments to plan for inundation and sea level rise impacts. Federal regulations allow localities to exceed minimum federal standards, enabling location-specific sea level rise adaptation strategies. Discounts in National Flood Insurance Program (NFIP) rates can be obtained by going beyond minimum federal and state requirements and some communities (e.g., Gloucester County, Chesapeake) are using committees of citizens to help plan those additional steps. Many hazard mitigation plans in Virginia include sea level rise discussions, and other localities are including sea level rise in their floodplain management plans (see Table 2 for examples).

The U.S. Department of Transportation requires states[12] and regions[13] to complete long range transportation plans prior to receiving federal transportation funding and these plans require extensive

---

[8] Office of the Governor, Commonwealth of Virginia, Continuation of the Virginia Coastal Zone Management Program, Executive Order No. 18 (2010), *available at* http://www.governor.virginia.gov/PolicyOffice/ExecutiveOrders/pdf/EO_18.pdf.

[9] 44 C.F.R. § 201.3(d).

[10] *See* 44 C.F.R. Chapter 1, Subchapter B.

[11] VA. CODE ANN. § 10.1-602.

[12] 23 C.F.R. § 450.206.

[13] *Id.* § 450.306.

public notice and participation opportunities. In shoreline communities, inundation of transportation segments with sea level rise/storm surges is a long-range risk that could be included in these plans. The current Virginia long-range transportation plan has a section discussing climate change impacts including sea level rise, although there are no recommendations for acting on those projected impacts. The regional Hampton Roads regional long-range transportation plan also included a discussion on sea level rise. On September 24, 2012, the Federal Highway Administration announced federal cost-sharing would be available for, "activities to plan, design, and construct highways to adapt to current and future climate change and extreme weather events."[14]

The U.S. Department of Commerce requires a regional Comprehensive Economic Development Strategy (CEDS) prior to being eligible for many Commerce funding programs.[15] These regional plans are another opportunity for further climate change planning. The Hampton Roads, Virginia CEDS (Vision Hampton Roads) mentions climate change/sea level rise as one of the economic challenges facing the region. For example, an identified subcommittee action is to "Develop a long-range adaptation strategy for the impacts of climate change and sea level rise on Hampton Roads in order for Hampton Roads to be a region of excellence for environmental distinction."[16]

In addition to incentive programs, federal guidance can provide standards and opportunities for regions and localities in their sea level rise planning efforts. The U.S. Army Corps of Engineers (USACE) issued an engineering guidance in 2011, entitled "Sea-Level Change Considerations for Civil Works Programs" (Circular No. 1165-2-212), in which they proposed a formula for sea level rise adaptation to be used on any construction project within their civil works division.[17] This guidance is the first federal government policy that anticipates sea level rise and will have an impact in Virginia, given its large military and federal presence along the tidal shoreline and the use of this guidance by the USACE in their projects throughout the Hampton Roads region.

The Coastal Zone Management Act (CZMA) was established in 1972 and is administered by the National Oceanographic and Atmospheric Administration. The CZMA authorizes state coastal zone programs, such as Virginia's, and requires the preparation of a management program for the coastal zone.[18] This program enables assessments of the natural resources in that zone. The CZMA language specifically mentions sea level rise as an element of concern – "(l) Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence."[19]

B. State Action

In 2008, a state government review of climate change impacts in Virginia was conducted by the Governor's Commission on Climate Change.[20] Then-governor Tim Kaine established the Commission with Executive Order No. 59, issued in December 2007. The Commission was a direct result of the

[14] U.S. Department of Transportation, Federal Highway Administration, Memorandum: Eligibility of Activities to Adapt to Climate Change and Extreme Weather Events Under the Federal-Aid and Federal Lands Highway Program (Sept. 24, 2012), *available at* http://www.fhwa.dot.gov/federalaid/120924.cfm

[15] 42 U.S.C. § 3162.

[16] HAMPTON ROADS PARTNERSHIP, VISION HAMPTON ROADS ANNUAL REPORT 32 (2011), *available at* http://hrp.org/Site/docs/Publications/VisionHamptonRoads_AnnualCEDSreport_30Sep11.pdf.

[17] Circular No. 1165-2-212 is available at http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf.

[18] *See* 16 U.S.C. § 1455.

[19] 16 U.S.C. § 1451(l).

[20] A record of the Governor's Commission on Climate Change's meetings and deliberations is maintained by Wetlands Watch at http://www.sealevelrisevirginia.net/main_CCC_files/.

Virginia Energy Plan issued that same year, which established the need for a 25% reduction in greenhouse gas emissions in Virginia, laid out energy conservation and renewable energy options to partially meet those goals, and recommended a Climate Change Commission to find ways to meet the rest of the greenhouse gas reduction goals. The Commission was composed of 39 members/stakeholders from a range of sectors and was chaired by then-Secretary of Natural Resources, L. Preston Bryant, Jr. The Commission was one of 29 state climate change commissions nationwide that met during the period from 2007 – 2009.

The climate change adaptation and sequestration workgroup was chaired by then-Delegate Joe Bouchard and made a number of recommendations for actions to be taken by Virginia in order to adapt to those irreversible climate change impacts that were known. The Commission agreed by consensus that over the coming 100 years, Virginia would see sea level rise between 2.3 and 5.2 feet, would experience a warming of 3.1°C (5.6°F), and that precipitation would increase by 11%, all regardless of any action taken to reduce greenhouse gas emissions.[21]

Few of the adaptation options recommended by the Commission have been acted upon. Implemented actions include: policy actions for mapping (recommendation 14N), policies emphasizing the use of living shorelines for erosion control (14A), including sea level rise in local government long-range plans (14C), and use of shoreline management plans that include sea level rise (14U).

Beginning in 2013, pursuant to Va. Code § 15.2-2223.2, localities in Tidewater Virginia will need to include coastal resource management guidance in their comprehensive plans. This guidance will be developed in part by the Virginia Institute of Marine Science (VIMS) and "shall identify preferred options for shoreline management and taking into consideration the resource condition, priority planning, and forecasting of the condition of the Commonwealth's shoreline with respect to projected sea-level rise."[22] This new requirement aims to provide more detail and depth to the evaluation of inundation and sea level rise impacts in tidal localities in Virginia. This program implements recommendations 14D and 14U of the Governor's Commission on Climate Change. To date, all of the implemented policies have been enacted on a local level, none of the state-level policy recommendations have been implemented, and there has been minimal high-level state agency action on the issue of sea level rise adaptation since the 2008 Climate Change Commission report.

In 2011, the Virginia General Assembly requested that the Virginia Institute of Marine Science conduct a study of the strategies for adaptation to recurrent flooding in the Tidewater and Eastern Shore regions of Virginia.[23] While the study compiled and reviewed an extensive amount of existing data and findings, it concluded that:

- Recurrent flooding is a significant issue and one that is predicted to become worse over a 20- to 50-year planning horizon;
- Risks from recurrent flooding are not same throughout the Tidewater region;
- Data are lacking for comprehensive and fine resolution analysis of risks;
- It is possible for Virginia to develop an effective response but it takes 20-30 years to effectively plan and implement adaptation strategies; and

[21] GOVERNOR'S COMMISSION ON CLIMATE CHANGE, FINAL REPORT: A CLIMATE CHANGE ACTION PLAN 5 (2008), *available at* http://www.sealevelrisevirginia.net/docs/homepage/CCC_Final_Report-Final_12152008.pdf. The SUMMARY OF NATURAL RESOURCES/SHORELINE ADAPTATION STRATEGY RECOMMENDATIONS OF THE VIRGINIA COMMISSION ON CLIMATE CHANGE (2009) is available on the Wetlands Watch website at http://wetlandswatch.org/Portals/3/WW%20documents/Adap_Strat_adopted_VCCC_062109.pdf

[22] VA CODE ANN. § 28.2-1100.9.

[23] MOLLY MITCHELL ET AL., RECURRENT FLOODING STUDY FOR TIDEWATER VIRGINIA, VIRGINIA SENATE DOCUMENT NO. 3 (2013), *available at* http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf.

- The optimal adaptation strategy will be a flexible plan that matches adaptation options to each coastal locality and links implementation to the evolving risks.[24]

The study recommended that state and local governments in Tidewater Virginia:

- Immediately begin comprehensive and coordinated planning efforts;
- Initiate identification, collection and analysis of data needed to support planning;
- Assess local government legal authority to address current and projected flooding risks, and enact authorizing legislation; and
- Develop a comprehensive state strategy, including prioritization of action and analysis of appropriateness, feasibility, and cost/benefit of strategy implementation.[25]

Further, the study noted that state leadership is needed to better access relevant federal resources, transcend local boundaries, standardize assessment methods for prioritization efforts, and enable local community action.

C. Regional Action

Much of the regional planning for sea level rise has occurred within the regional planning district commissions (PDCs; of which there are 8 in Tidewater Virginia). PDCs are enabled to "encourage and facilitate local government cooperation and state-local cooperation in addressing on a regional basis problems of greater than local significance…"[26] Local governments voluntarily join PDCs, pay membership fees, and receive technical assistance and program services on an array of local land use, economic development, natural resources, transportation, and other infrastructure issues. The PDCs are composed of appointed elected officials and citizens, and local government staff. PDCs are funded by local government contributions, state appropriations, and grants. PDCs actively supports localities, but have no authority to enact adaptation strategies.

Since 2008, VA CZM has supported efforts by several coastal PDCs to help plan for climate change adaptation, particularly work to characterize, assess, and map the risk and community vulnerability from sea level rise and storm surges. VA CZM has supported the following coastal PDC projects over a three-year period (2009-2011), generally between $40,000-$70,000 per project annually. (Table 1).

[24] *Id.* at vi – vii.
[25] *Id.* at vii – viii.
[26] VA. CODE ANN. § 15.2-4207(A).

Table 1. PDC projects related to climate change adaption.

PDC	Project	Topic
Hampton Roads	*Climate Change in Hampton Roads: Impacts and Stakeholder Involvement*	• Collection and analysis of available data on vulnerability and impact analysis. • Local government staff meetings on impacts. • Development of a regional framework for responding to climate change, including guidelines and recommendations.
	Storm Surge Vulnerability and Public Outreach	• Estimating potential impacts from gathered data, including current exposure and vulnerability to storm surges from hurricanes.
	Sea Level Rise in Hampton Roads, Virginia	• Development and demonstration of a GIS-based tool to estimate exposure to future sea level rises, across sectors (e.g., population, built environment, natural environment, economy).
Middle Peninsula	*An Assessment of Potential Anthropogenic and Ecological Impacts of Climate Change*	• Collection, assessment, and analysis of available information on climate impacts on the Middle Peninsula, including human communities and institutional impacts, threats to estuarine environments and coastal wetlands, and impact on marine fisheries.
	Facilitation of Presentations and Discussions of Climate Change Issues with Local Elected Officials and Public	• Prioritization of anthropogenic and environmental impacts for adaptation and education/outreach responses through engagement with local officials and general public.
	Ecological and Anthropogenic Impacts	• Development of a planning technical assistance kit containing locally applicable scientific data, vulnerability assessment tool, case studies, and sample ordinances.
Northern Virginia	*Sustainable Shoreline Community Management I*	• Inventorying existing data resources and policies, identifying data gaps, and assessing current local shoreline management regulations.
	Sustainable Shoreline Community Management II	• Refining sea level rise and storm surge vulnerability map. • Survey of waterfront property owners. • Development of adaptation strategy recommendations.
	Preparing Shorelines for Sea Level Rise	• In collaboration with Northern Virginia Hazard Mitigation Planning process, strategies developed to prepare for sea level rise and storm surge inundation impacts.

While other PDC and local government assessments of impacts from sea level rise and inundation exist, the VA CZM-funded projects represent a comprehensive example of the vulnerability assessments underway in the mid- to late- 2000s that established the foundation of awareness among local government officials. The PDC actions also demonstrate the regional scale of the climate change impact in Virginia's coastal zone.

Although less regionally defined, there have been some community conversations throughout southern Tidewater Virginia. In 2011 and 2012, the Virginia Sea Grant Program funded four community conversations on sea level rise. The first set of conversations was held in Virginia Beach, with four

sessions conducted over a two-day period, involving 128 citizens who discussed impacts from increased flooding that they had observed. A second focus group meeting was held in Virginia Beach in 2012 to determine citizen reaction to proposed adaptation measures. A community conversation on sea level rise was held on the Eastern Shore in 2012 and drew 200 people. A fourth meeting was funded on Virginia's Middle Peninsula, in a focus group format, to explore impacts and acceptable adaptation options there.

In 2012, Old Dominion University, Hampton Roads PDC, and Virginia Sea Grant launched a series of Forum meetings among local planners, stormwater managers, emergency management officials, and other facility managers from predominantly local, but also state and federal facilities. The Forum will extend at least into early 2014 and seeks to facilitate information sharing and networking among on-the-ground staff responsible for facility adaptation activities in the Hampton Roads region, and funding secured from the National Sea Grant Office in the National Oceanic and Atmospheric Administration will also support public meetings in 2013 and 2014.[27] Thus local dialogue among citizens, facility managers and other stakeholders across the region is beginning to occur.

D. Local Action

Every Virginia locality is required to develop a long-range land use plan which is to be reviewed and revised on a five-year cycle:

> The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources, best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, including the elderly and persons with disabilities.[28]

These plans usually have a 20-year planning horizon and the "probable future needs" clause above would allow consideration of long-range flooding and sea level rise adaptation planning.

In "Tidewater" localities, comprehensive plans and zoning authorities are also required under the Chesapeake Bay Protection Act to include water quality protection measures, including zones protected from disturbance along the shoreline.[29] These additional natural resource planning requirements provide opportunities to discuss and plan for tidal flooding and sea level rise. Consequently, general inundation and sea level rise concerns are reflected in every long-range land use plan developed and approved by a Tidewater locality since 2008, although these plans have not included specific development policies. Table 2 below provides a sample of local references to sea level rise in comprehensive, hazard mitigation, and floodplain management plans.

---

[27] *See* Old Dominion University, Climate Change and Sea Level Rise, http://www.odu.edu//research/initiatives/ccslri (last visited Apr. 15, 2013), and Virginia Sea Grant, *Adaptation and Flooding Forum Promotes Sharing Among Hampton Roads Communities*, Dec. 6, 2012, http://vaseagrant.vims.edu/2012/12/06/adaptation-and-flooding-forum-promotes-sharing-among-hampton-roads-communities/ (last visited Apr. 15, 2013).

[28] VA. CODE ANN. § 15.2-2223(A).

[29] *Id.* § 10.1-2100.

Table 2. Sample of Climate Adaptation Steps by Municipalities in Hampton Roads Region.

Municipalities	Hazard Mitigation Plans[30]	Comprehensive Plans	Floodplain Management Plans
Gloucester	Middle Peninsula Natural HMP (pg. 241)		A Coastal Floodplain Management Plan for Gloucester County, Virginia (pg. 9)[31]
Hampton	Peninsula HMP (pg. 51)	Hampton Comprehensive Waterways Management Plan (pg. 2)[32]	
Isle of Wight	Southside Hampton Roads HMP (pg. A:16)	Comprehensive Plan, Isle of Wight County, Virginia (pg. 2-23)[33]	
James City	Peninsula HMP (pg. 51)	James City County 2009 Comprehensive Plan (pg. 63)[34]	
Newport News	Peninsula HMP		
Norfolk	Southside Hampton Roads HMP (pg. A:25)		
Poquoson	City of Poquoson, Virginia Multi-Hazard Mitigation Plan (pg. 31)	City of Poquoson Comprehensive Plan 2008-2028 (pg. 5-3)[35]	Flood Insurance Study[36]
Portsmouth	Southside Hampton Roads HMP (pg. A:43)		City of Portsmouth 2010 FMP (pg. 26)[37]
Suffolk	Southside Hampton Roads HMP	Comprehensive Plan for 2026, City of Suffolk, Virginia (pg. 5-2)[38]	
Surry	Richmond-Crater Multi-Regional HMP (pg. 5-132)		
Virginia Beach	Southside Hampton Roads HMP (pg. A:65)	City of Virginia Beach, Comprehensive Plan Policy Document (pg. 7-3)[39]	
Williamsburg	Peninsula HMP (pg. 51)		
York	Peninsula HMP (pg. 118)	Charting the Course to 2025 - The County of York Comprehensive Plan (pg. G-1)[40]	

[30] All community hazard mitigation plans can be found on the Commonwealth of Virginia's Department of Emergency Management website at http://www.vaemergency.gov/em-community/plans/local-mit.
[31] www.gloucesterva.info/Portals/0/es/documents/FinalFloodplainManagementPlanAdoptedSeptember2009.pdf.
[32] For URLs to many engineering studies conducted for the City of Hampton, *see* http://www.hampton.gov/publicworks/engineering/historical_studies.html.
[33] http://www.co.isle-of-wight.va.us/planning-and-zoning/download/Comprehensive%20Plan/Isle%20of%20Wight%20County%20Comprehensive%20Plan.pdf.
[34] http://www.jamescitycountyva.gov/administration/comprehensive-plan.html.
[35] http://www.ci.poquoson.va.us/sites/default/files/CompPlan03.22.10_0.pdf.
[36] https://www.rampp-team.com/county_maps/virginia/poquoson/poquoson_city_va_pmr_fis_tables1_.pdf.
[37] http://www.portsmouthva.gov/planning/images/2010-Flood-Plan-Directions-Final-Draft.pdf.
[38] http://www.suffolkva.us/pcd/comprehensive-planning/2026-comprehensive-plan/volume-1/.
[39] www.vbgov.com/government/departments/planning/2009CompPlanProcess/Pages/default.aspx/compplandocs/Documents/CP_PolicyDocument_Web.pdf
[40] http://www.yorkcounty.gov/Default.aspx?tabid=1723.

Beyond Hampton Roads, yet still in the Virginia coastal zone, other communities have acknowledged sea level rise and adaptation needs in their general guidance and planning documents. For example, Accomack County on the eastern shore of Virginia contains general recommendations for development given sea level rise in their comprehensive plan.[41] Mathews County in the Northern Neck region along the western shore of the Chesapeake Bay has recommendations for future development and expresses concern about climate changes and its impact on septic systems in their comprehensive plan.[42]

IV. Additional Milestone Events in Virginia's Considerations of Climate Change

While not an exhaustive list of bellwether events that have influenced the place for climate change on the policy agenda in Virginia, a few milestones are noteworthy:

- In 2007, the city of Norfolk let a contract to study coastal flooding in the city. While the study request for proposals did not mention sea level rise, the resulting study has brought this issue central to the discussion of tidal flooding in Norfolk. This study has resulted in a comprehensive flooding strategy for the city of Norfolk, one that readily admits sea level rise has to be taken into account. The study, conducted by Fugro Atlantic, a Dutch environmental engineering firm, suggested immediate protection measures of most vulnerable and essential infrastructure—floodwalls, tide gates, elevated roads, and water pumping stations. The cost estimate was $300M.[43] Another consulting firm, Timmons Group, identified the inadequacy of Norfolk's stormwater system to handle more frequent major storms and recommended a $775M upgrade—Norfolk's annual stormwater budget is $6M.[44]

- The political leadership of Norfolk has been direct in confronting its inundation issues, with Norfolk's Mayor Paul Fraim stating that one of the options that must be considered is a managed "retreat"[45] from areas for which other adaptation options cannot be used.[46] Such statements from local elected officials have not been forthcoming from other communities in the Virginia coastal zone.

- In 2010, the city of Hampton, Virginia, engaged in a year-long comprehensive, citizen-led review of the city's waterways and their management. Tidal flooding and sea level rise were one focus of this effort. The final report, the "Hampton Comprehensive Waterways

---

[41] *See generally*, ACCOMACK COUNTY, VIRGINIA, 2008 COMPREHENSIVE PLAN UPDATE (2008), *available at* http://www.co.accomack.va.us/Planning/2008_comprehensive_plan_update.html.

[42] *See* MATHEWS COUNTY, VIRGINIA, 2030 COMPREHENSIVE PLAN (2011), *available at* http://www.mathewscountyva.gov/home/showdocument?id=1433.

[43] Kevin Smith, Fugro Atlantic, City of Norfolk City-wide Coastal Flooding Study, Presentation to Storm Water Working Group, Feb. 29, 2012, *available at* http://www.norfolk.gov/DocumentCenter/View/3977. *See also*, Darryl Fears, *Built on sinking ground, Norfolk tries to hold back tide amid sea-level rise*, THE WASHINGTON POST, June 17, 2012, http://articles.washingtonpost.com/2012-06-17/national/35459771_1_sea-level-rise-sea-levels-hampton-roads.

[44] Fears, *supra* note 43.

[45] Meghan Hoyer, *Consultants Work on Flood Plan as Tides Rise and Norfolk Sinks*, PILOTONLINE.COM, Aug. 6 2010, http://hamptonroads.com/2010/08/consultants-work-flood-plan-tides-rise-and-norfolk-sinks.

[46] William Bragham, *Rising Tide in Norfolk Virginia*, Need-to-know on PBS, April 27, 2012, http://www.pbs.org/wnet/need-to-know/environment/rising-tide-in-norfolk-va/13739/ (last visited Mar. 12, 2013).

Management Plan," was issued in 2012 and provides a number of options for addressing tidal flooding in that city.[47] The study was noteworthy for its citizen engagement and the specific response recommendations.

- In 2012, the National Aeronautics and Space Administration (NASA) conducted a climate change impact review of its two facilities in Virginia, its research facility at Langley and its launch facility at Wallops Island, on the eastern shore. These planning efforts noted significant challenges to these two shoreline facilities due to sea level rise and other climate change impacts.[48] In general, the federal facilities in the Hampton Roads have been active in planning and studying adaptation issues (e.g., U.S. Army Engineer Research and Development Center study of the Norfolk Naval Station[49]), and some have conducted adaptation activities on their facilities (e.g., raising docks at the Norfolk Naval Station[50]). The Langley Air Force Base has sought $5.5M for flood protection measures.[51] However, the federal facilities have not coordinated a consistent federal message,[52] nor have they been facilitating region-wide discussions on adaptation strategies and approaches.

These examples are shaping the rapidly evolving context for climate adaptation in Virginia's coastal zone. Virginia's Tidewater region has accepted storm surge inundation and more frequent flooding from climate change, although it faces the implementation realities.

V. Virginia's Policy Climate for Climate Change—The Implementation Gap

Local governments in the coastal zone of Virginia are increasingly aware of and talking about sea level rise and the need to adapt to it. This is evident in local comprehensive, hazard mitigation, and floodplain management plans. However, a substantial implementation gap exists between guidance and overarching plans which acknowledge climate change issues and the specific ordinances, codes, and best management practices to address those issues. Progress has been limited by several factors.

---

[47] HAMPTON ROADS CITY COUNCIL, HAMPTON COMPREHENSIVE WATERWAYS MANAGEMENT PLAN: FINAL REPORT (2012), *available at* http://www.hamptonva.gov/publicworks/engineering/waterways_management/waterways_management_plan.pdf.

[48] NASA Langley Research Center, Delivering for Today…, Preparing for Tomorrow, http://www.norfolk.gov/DocumentCenter/View/1767.

[49] K. A. Burks-Copes and E. J. Russo. (In press). Risk Quantification for Sustaining Coastal Military Installation Assets and Mission Capabilities, Final Technical Report. Prepared by the U.S. Army Engineer Research and Development Center (ERDC), Environmental Laboratory (EL), Vicksburg, MS for the Strategic Environmental Research and Development Program (SERDP) under project #RC-1701. *See also*, Old Dominion University, Quantifying Risks of Climate Change and Sea Level Rise to Naval Station Norfolk, http://www.odu.edu/research/initiatives/ccslri/calendar/2012/12/risks_of_climate_cha.

[50] Joe Bouchard, Friends don't let friends marry climate scientists, Virginia Sea Grant Policy Seminar Series (Nov. 17, 2010), *available at* http://vaseagrant.vims.edu/2010/11/12/vss-fall-2010/.

[51] David Macaulay, *Langley AFB wants $5.5 million in flood protection*, THE DAILY PRESS, Apr. 7, 2010, http://articles.dailypress.com/2010-04-07/news/dp-local_floodrisk_0407apr07_1_flood-protection-factory-point-langley-air-force-base.

[52] Skip Stiles, Op., *The Coastal Conundrum*, THE WASHINGTON POST, Dec. 14, 2012, http://articles.washingtonpost.com/2012-12-14/opinions/35847620_1_coastal-homes-coastal-communities-coastal-towns.

For example, there has been limited regional coordination and response. The 2013 recurrent flooding study for the Virginia General Assembly noted:

> In areas where the government takes little or no action to stem flooding issues, individuals will take actions to protect their properties. However, property owners have different incomes to work with and different levels of education about the effectiveness of flood adaptation strategies, leading to a coastline scattered with a variety of protection measures that have variable success. The failure of one protection measure may impact the success of adjacent structures (Jarungrattanapong and Manasboonphempool 2009); therefore, the lack of community scale planning is likely to contribute to community level failures. In Virginia, where flooding is a widespread problem, the cooperation of the federal, state and local governments in conjunction with the property owners will increase chances of successful adoption of adaptation strategies. [53]

At the state level, there has been limited engagement and, as a Dillon Rule state, the lack of state policy fails to empower localities to develop and implement adaptation plans. Similarly, the federal facilities have shown limited leadership-by-example that may facilitate regional coordination. Further, the costs of response, over a $1 billion in the City of Norfolk, can be daunting and potentially debilitating.

The initial steps needed to move forward on climate change adaptation were laid out by the Governor's Commission on Climate Change in 2008 and those actions remain a roadmap for launching state and local government action. A review of climate change impacts to state programs and activities and a review of state statutory and regulatory authority to deal with those impacts are actions items laid out in the Commission's report. These reviews may likely reveal areas of needed authority and empowerment necessary for localities to begin adaptation implementation.

The federal government has initiated planning on its facilities in Virginia and has an engineering guidance for U.S. Army Corps of Engineers civil works construction projects, and these initiatives may begin to drive adaptation implementation in Virginia's coastal zone. However, until localities are enabled to take action, the state will lag in implementing climate change adaptation measure. Nonetheless, while Virginia faces an implementation gap between overarching plans and guidance acknowledging climate change concerns and the concrete ordinances, codes, and other measures to address those concerns, the pathways forward are multi-faceted with opportunities for action, leadership, and collaboration from the local, regional, state, and federal level.

[53] MOLLY MITCHELL ET AL., RECURRENT FLOODING STUDY FOR TIDEWATER VIRGINIA, VIRGINIA SENATE DOCUMENT NO. 3 at 38 (2013), *available at* http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf, *citing* R. JARUNGRATTANAPONG AND AREEYA MANASBOONPHEMPOOL, ADAPTATION STRATEGIES TO ADDRESS COASTAL EROSION/FLOODING: A CASE STUDY OF THE COMMUNITIES IN BANG KHUN THIAN DISTRICT, BANGKOK, THAILAND (2009).

English Common Law Grants under Virginia Law: Rivers, Tides and the Taking Clause

James W. Jennings, Jr. and Erin B. Ashwell[1]

Abstract: The Commonwealth of Virginia assumes that it owns the lands underneath the waters of the state. By assuming ownership of submerged lands, which are often privately owned, the Commonwealth may affect a taking of private property. Further, the Commonwealth's assumption that it owns streambeds imposes costs on private landowners and the public and leads to conflicts between landowners and fishermen.

I. Introduction

Legislators and departments regulating Virginia's tidal areas and waterways face an unusual problem: they cannot rest assured that the submerged lands and shores they regulate belong to the Commonwealth as opposed to private individuals, even where the General Assembly of Virginia has attempted to reserve those lands by statute.[2] Grants from the Crown of England to private individuals and grants from the early Virginia state government sometimes conveyed the ownership of the bed of

[1] James W. Jennings, Jr. is a principal at Woods Rogers PLC. He is a Professor of Practice at and a graduate of the Washington & Lee University School of Law. Erin B. Ashwell is an associate at Woods Rogers PLC and a graduate of Harvard Law School.

[2] VA. CODE ANN. § 28.2-1200. ("All the beds of the bays, rivers, creeks and the shores of the sea within the jurisdiction of the Commonwealth, not conveyed by special grant or compact according to law, shall remain the property of the Commonwealth and may be used as a common by all the people of the Commonwealth for the purpose of fishing, fowling, hunting, and taking and catching oysters and other shellfish. No grant shall be issued by the Librarian of Virginia to pass any estate or interest of the Commonwealth in any natural oyster bed, rock, or shoal, whether or not it ebbs bare.") The difficulty, as this paper shall argue, is determining what was not previously granted.

waterways, including lands under navigable waterways.[3] These grants, called Crown Grants and Commonwealth Grants, pepper the Commonwealth and are not easily identified. Crown grants often conveyed further rights, including the exclusive right to hunt and fish the waterway within the property granted.[4]

The potential problems faced by Virginia's lawmakers and regulators are heightened because, as this article argues, the administrative policy of Virginia's government assumes that the Commonwealth owns property that, under settled Virginia law, is privately owned. Further, the identity and scope of Crown Grants is difficult to ascertain. This creates the prospect that even carefully crafted statutes and regulations will create an actual or a regulatory taking of private property, subjecting the Commonwealth to litigation and the duty to compensate a private property owner for lost rights. This also burdens private landowners, who must prove title to their property on a case-by-case basis and face a presumption that their individually owned property belongs to the public.

This article begins by examining existing literature on Crown and Commonwealth Grants and the basic strictures of the Takings Clause. It then considers how Virginia's case law creates its own view of English common law as to colonial land grants. In particular, the article examines how that law resists clear categorization as to which lands carry ownership of the streambed. The article then compares the decisions of Virginia's courts with the policy announced by a Virginia Attorney General's Opinion and the Virginia Marine Resources Commission (VRMC), to show that the state government presumes to own property that the Supreme Court of Virginia has held is privately owned. The article concludes by analyzing the criteria used by Virginia courts to determine ownership of streambeds and attendant rights in the encompassed waterways.

While existing research has addressed the structure of property law on Virginia's shores, it has not addressed related Commonwealth Grants nor has it attempted to describe the differences between Crown Grants and other grants, and the steps necessary to distinguish the two.[5] Further, the literature has not been updated in light of the Supreme Court of Virginia's landmark decision in *Kraft v. Burr*, which recognized a private landowners' right to exclude others from fishing on a navigable river.[6] While the *Kraft* case has been discussed by those concerned with Virginia's resources,[7] its broader implications for Virginia law on the ownership of submerged lands and the related process for

[3] *See, e.g.,* Boerner v. McAllister, 89 S.E.2d 23, 27 (Va. 1955) (noting that grants made prior to 1802 could convey streambed).

[4] Kraft v. Burr, 476 S.E.2d 715 (Va. 1996).

[5] For a discussion of the problem of movement of barrier islands, see Amy H. Moorman, *Let's Roll: Applying Land-Based Notions of Property to the Migrating Barrier Islands*, 31 WM. & MARY ENVT'L L. & POL'Y REV. 459, 474, 485 (2007) (discussing movement of barrier island and public's right to use property in connection with *Bradford v. Nature Conservancy*). Similarly, for a description of the structure of Virginia property law concerning water rights on the Virginia shore, see Denis J. Brion, *The Unresolved Structure of Property Rights in the Virginia Shore*, 24 WM. & MARY L. REV. 727 (1983).

[6] 476 S.E.2d at 718.

[7] *See, e.g.*, Elizabeth A. Murphy, *Inland Recreational Fishing Rights in Virginia: Implications of the Virginia Supreme Court Case* Kraft v. Burr, VIRGINIA WATER RESOURCES RESEARCH CENTER, VIRGINIA TECH (Mar. 1999).

determining ownership have not been explored.[8] The process is particularly important because the costs associated with determining ownership are likely to be a burden on the Commonwealth and on private landowners who seek to control submerged lands.

II. The Takings Clause and Virginia's Administrative Presumption of Submerged Lands Ownership

Larry George, a former West Virginia Commissioner of the West Virginia Division of Energy, Deputy Director of the West Virginia Division of Natural Resources and former member of the West Virginia State Water Resources Board,[9] has described Virginia and West Virginia law on submerged waters as "anachronistic."[10] The application of contemporary takings law to Crown and Commonwealth grants necessarily creates an anachronism because there was no understanding that just compensation had to be provided for takings of private property during Virginia's Colonial era or early statehood.[11] Colonial and early state governments routinely seized private property for public purposes,[12] and early constitutions did not have just compensation clauses.[13]

The requirement that the federal government provide just compensation for takings came with the passage of the Bill of Rights.[14] The Takings Clause was held to apply to the states in 1897.[15] State constitutions later adopted their own protections.[16] Significantly, takings may result from physical invasion or regulatory strictures (so-called "regulatory takings") that deprive an owner's use of their property.[17]

The concern regarding takings is twofold: first, the executive branch of Virginia's government presumes to own property that very likely is privately owned. This creates a situation in which the Commonwealth exercises ownership over property it does not own. Second, as understandings of

---

[8] For a discussion of private ownership of watercourses, see Larry W. George, *Public Rights in West Virginia Watercourses: A Unique Legacy of Virginia Common Lands and the Jus Publicum of the English Crown*, 101 W.V. L. REV. 407, 410-25 (1998) (discussing Virginia and West Virginia law). Because West Virginia's early law originates in Virginia, this includes a discussion of what properties are privately owned under Virginia law. *Id.* at 410. However, our analysis differs from that of Larry George's in a few crucial dimensions, particularly as to what waters constitute "eastern" as opposed to "western" (*id.* at 410), as to when private title to watercourses could be obtained (*id.* at 413), and whether title to submerged lands along tidal watercourses was obtained *(id).* Though this paper is concerned with the law of Virginia, other states including West Virginia and Kentucky have similar complications to their property law because land was granted in those states when they were part of Virginia. *See* Berry v. Snyder, 66 Ky. 266 (1867) (holding that the Ohio river conveyed to streambed by Commonwealth of Virginia, because English common law rule unchanged at time of conveyance); Gaston v. Mace, 10 S.E. 60, 66 (W.Va. 1889) (construing Virginia law and finding English common law unchanged as to western part of state until 1802).

[9] George, *supra* note 8, at 468 n.1.

[10] *Id.* at 409. West Virginia law on submerged lands turns in part on Virginia law on Crown Grants because of the states' shared colonial past.

[11] William Michael Treanor, *The Origins & Original Significance of the Just Compensation Clause of the Fifth Amendment*, 94 YALE L. J. 694, 697-98 (1985).

[12] *Id*. at 695.

[13] *Id.* at 700-01.

[14] *Id.* at 714.

[15] Chicago, Burlington & Quincy R.R. Co. v. City of Chicago, 166 U.S. 226 (1897).

[16] Treanor, *supra* note 11, at 714.

[17] *See, e.g.,* Pennsylvania Coal Co. v. Mahon, 260 U.S. 393 (1922) (holding that whether there is a regulatory taking depends on extent of diminution of value of property); Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992) (holding that a local restriction which deprived landowner of ability to construct houses on property was a taking because destroyed any economic value).

Virginia's rivers, their public uses, and navigability have evolved, so too has the legal definition of what is a navigable river. The term "navigability" under Virginia law has multiple meanings, each tied to a particular use of waterways. When a Virginia court seeks to determine property rights using concepts of navigability, it may improperly apply modern, more expansive definitions of navigability to Crown or Commonwealth grants, thereby eradicating or limiting private rights conveyed by the grant. This can mean a legal property right will be extinguished by exercise of a common law decision. The General Assembly can make the same error. This is a potential judicial or legislative taking: "If a legislature or a court declares that what was once an established right of private property no longer exists, it has taken that property, no less than if the State had physically appropriated it or destroyed its value by regulation."[18]

III. The Lingering Uncertainty of Ownership Under Some Very Old Law

A. Crown Grants and Commonwealth Grants, Defined

A Crown Grant, sometimes also called a Crown Patent, is generally understood to be a grant to a private individual from the British Crown.[19] Virginia has also recognized grants from the London Company, which held power to convey land until Virginia became a colony in 1624.[20] Until the Revolution, the British Crown could grant property to private individuals in the Colony of Virginia.[21] Grants made by the King of England were in the form of grants or letters of patent that were recorded in central bound volumes now under the custody of the Library of Virginia. These volumes were handwritten, and clerks frequently abbreviated the language of the grant by noting "etc." within the language of the grant and referencing a form page in the margin of the grant.[22] The form of the grant made varied; whether a grant conveyed ownership of a streambed is determined by English common law or, sometimes, the particular language of the grant or the composition of its accompanying plat.

It is difficult to state precisely when the Crown ceased to have the power to grant land in Virginia. Sources generally refer to this as the time of the Revolution or at the time of Virginia's "independence."[23] As a practical matter, the political disruptions surrounding the Revolutionary War made it difficult for individuals to record their land grants so that surveys made in connection with Crown Grants were not recorded.[24] The royal government of Virginia recorded the last patent under Crown authority on December 7, 1774.[25] The first Commonwealth Grant was not recorded until over four years later in October 1779.[26] The confusion regarding land grants stemming from the Revolutionary Era was part of the impetus behind the creation of Virginia's Land Office and related statutes that permitted individuals with existing claims to prove up their grants.[27]

---

[18] Stop the Beach Renourishment, Inc. v. Florida Dept. of Environmental Protection, 130 S.Ct. 2592, 2602 (2010) (Scalia, J., for Roberts, C.J. and Alito, J.) The full quote applies this prohibition to courts as well. This point is disputed in the other justices' separate opinions.

[19] *See, e.g.*, Miller v. Commonwealth, 166 S.E. 557, 558-59 (Va. 1932); Kraft v. Burr, 476 S.E.2d 715, 715-16 (Va. 1996).

[20] *Miller*, 166 S.E. at 559.

[21] *Id.*

[22] *Kraft*, 476 S.E.2d at 718 n.5; 4 DENNIS RAY HUDGINS, CAVALIERS AND PIONEERS: ABSTRACTS OF VIRGINIA LAND PATENTS AND GRANTS xv-xvii, xxvii-xxviii (1994).

[23] 4 HUDGINS, *supra* note 22 *;* George, *supra* note 8, at 417.

[24] 8 DENNIS RAY HUDGINS, CAVALIERS AND PIONEERS: ABSTRACTS OF VIRGINIA LAND PATENTS AND GRANTS vii (2005).

[25] *Id.* at vii.

[26] *Id.*

[27] *Id.* at vii-xii.

The term Commonwealth Grant is less commonly used, but as used here, it refers to grants of land made to individuals from the Commonwealth of Virginia. Commonwealth Grants were initially made under the same law as Crown Grants because the common law of England remained in force and effect in the Commonwealth of Virginia until changed by statute.[28] Virginia began reserving ownership of submerged lands to the state in the late eighteenth century.[29]

Crown and early Commonwealth Grants can convey ownership of submerged lands: whether they do so turns on whether the submerged lands or shore are along a navigable river, and for grants along tidal waters the plat and text of the grant, and when the grant was made.[30] Because the term navigability is difficult to define,[31] the next section begins this discussion with grants along tidal and non-tidal rivers. This is a matter of state law, but federal and state law have defined those terms to have different meanings, leading to confusion.

B. Whose Law Governs Anyway and What Does Navigability Mean?

Rights to submerged lands in Virginia's waterways and along the coast are subject to seemingly contradictory federal and state law provisions, with a waterway being held to be navigable for purposes of federal law, but non-navigable under state law. State and federal law create separate spheres of influence, with private property rights determined by state law, but doctrines such as the navigational servitude determined by federal law.[32]

1. The Separate Spheres of State and Federal Law

Whether submerged lands are privately owned is a question of state law.[33] In determining whether the Jackson River in western Virginia is subject to the federal right of navigation, the Fourth Circuit explicitly noted a separation between federal and state questions of law. "[T]he use of its [the Jackson River's] bed and its banks are matters of state law, subject only, so far as the United States is concerned here, to the navigational servitude and whatever regulation Congress may lawfully impose."[34] To that end, the federal government does not claim an ownership in the beds. "The technical title to the beds of the navigable rivers of the United States is either in the states in which the rivers are situated, or in the owners of the land bordering upon such rivers. Whether in one or the other is a question of local law."[35]

Virginia law provides a similar outcome, leaving the question of ownership to its own precedents and English common law for the time periods when the common law remained in force.[36] Thus, the question of who owns submerged lands in a waterway becomes a question of state law.

2. A Navigable Non-Navigable Waterway (Or A Non-Navigable Navigable Waterway)

Though state law controls questions regarding ownership, federal interpretations of navigability

[28] Miller v. Commonwealth, 166 S.E. 557, 559 (Va. 1932).
[29] *See* discussion *infra* Section III.E.
[30] *See infra* Section III.C.
[31] *See* discussion *infra* Section III.E.
[32] 42 U.S.C. § 1331 (2006); United States v. Chandler-Dunbar Water Power Co., 229 U.S. 53, 60 (1913); Loving v. Alexander, 745 F.2d 861, 868 (4th Cir. 1984); Kraft v. Burr, 476 S.E.2d 715, 716-17 (Va. 1996); Commonwealth v. Morgan, 303 S.E.2d 899, 901-02 (Va. 1983).
[33] Loving, 745 F.2d at 868; Kraft, 476 S.E.2d at 716-17.
[34] Loving, 745 F.2d at 868.
[35] *See also*, Chandler-Dunbar Water Power *Co.*, 229 U.S. at 60.
[36] Miller v. Commonwealth, 166 S.E. 557, 559 (Va. 1932).

distort the categorization of land as public or private as cases involving particular bodies of water tend to refer both to state and federal decisions. This is because, in determining the extent of federal control of a waterway, a federal court will ask if the water is navigable.[37] Federal decisions become intertwined in the common law style reasoning of Virginia courts, thereby importing decisions made on different tests into Virginia cases.[38] Further, federal and state tests for navigability are different, and Virginia's has changed over time.[39]

For example, in *Loving v. Alexander*, individual landowners along the Jackson River challenged the U.S. Army Corps of Engineers and opposed allowing the public access to the surface of the river by claiming that the Jackson River was non-navigable.[40] By tradition, landowners believed that they owned the Jackson River's riverbed as a result of early Crown grants and indeed many had paid local property taxes on the streambed.[41] The U.S. District Court for the Western District of Virginia reviewed the record of three cases from the Supreme Court of Virginia, each of which had dealt with either whether the Jackson River was floatable or whether it was navigable.[42] The District Court determined that the Jackson River was navigable for purposes of a federal navigational servitude, while under state law the Jackson River was non-navigable.[43] These findings meant that under state law, private ownership of the streambed was possible, but that private ownership would be subject to a federal navigable servitude that required permitting the public access to the surface of the river.[44] Further, the Court found that requiring access was not a taking because there was no private property right in the flow of the river.[45] Thus, in Virginia, land may be privately owned, yet still require some public access.

With regard to the Jackson River, this led to an even more confusing situation. During the 1990s, landowners brought civil suit against those accused of trespassing on portions of the Jackson River that the owners asserted they owned in *Kraft v. Burr*.[46] The Circuit Court of Alleghany County determined that under English common law, the Jackson River was non-navigable and thus capable of private ownership.[47] Yet, in reviewing the appeal, the Supreme Court of Virginia phrased the question before it as whether a navigable river could be privately owned.[48] Virginia's Supreme Court determined that private ownership over the stream was possible, but never distinguished between the meanings of navigability on the river.[49]

Under early English common law, navigable rivers were those rivers "wherein *the tide ebbs and flows.*"[50] Minor on Real Property refers to such rivers as "public" rivers or navigable rivers and other rivers as private rivers. The Supreme Court of Virginia has incorporated this early distinction in a

[37] *See generally, Loving*, 745 F.2d at 861.
[38] *See* discussion in Loving v. Alexander, 548 F.Supp. 1079 (W.D. Va. 1982). *See also*, *Kraft*, 476 S.E.2d at 715 (referring to Jackson River as navigable).
[39] *Compare* Mead v. Haynes, 24 Va. 33 (1824), *with* Ewell v. Brock, 13 S.E.2d 333 (Va. 1941).
[40] 548 F.Supp. at 1081.
[41] *Id.* at 1091.
[42] *Id.* at 1083-84.
[43] *Id.* at 1089-90.
[44] *Id.*
[45] *Id.*
[46] Burr v. Kraft, 37 Va. Cir. 513, at * 1 (1993).
[47] *Id.*
[48] Kraft v. Burr, 476 S.E.2d 715, 715 (Va. 1996).
[49] *Id.* (referring to navigable river that was at trial level determined to be non-navigable for purposes of permitting ownership.)
[50] 1 MINOR ON REAL PROPERTY § 58 (2nd ed.) ("At common law, navigable or public waters are those wherein *the tide ebbs and flows*.").

number of its cases.[51] Because this article addresses ownership under Virginia's application of English common law, we employ the terms non-tidal and tidal to distinguish between the two big classifications of conveyances.

C. Ownership of Virginia's Shores and Crown Grants Along Non-Tidal Waters

Presumptions regarding land underneath non-tidal waters in Virginia are less complicated than those along tidal waters. As set forth elsewhere, the crux of the debate regarding non-tidal rivers has been over navigability and what rivers fall within the General Assembly's reservations of property from the late 1700s and 1802.

Virginia has held that grants from the Crown of England carry ownership of submerged lands where those lands run along a non-tidal stream or river.[52] Grants whose description run to a riverbank on a non-navigable water necessarily include the streambed to the middle of the stream, unless expressly excluded.[53] Similarly, where a piece of property encompasses both sides of a non-tidal river, the soil under the river is presumed to belong to the owner of the banks.[54] Several cases set out how a public's right to access a river and how the landowner's rights are determined on non-tidal rivers in Virginia.

1. Hot Springs Lumber & Mfg. Co. v. Revercomb

Use of the Jackson River was contested in the early 1900s because of a dispute over whether a logging company could use the Jackson River to drive logs downriver, thereby having logs come ashore in a manner that sometimes destroyed the banks.[55] Though the *Revercomb* case has been examined extensively in cases determining ownership of non-tidal waters, Revercomb's ownership of the riverbanks and soil underneath the Jackson River was not at issue. Rather, the case turned on the uses of property to which Revercomb, as landowner, had to submit:

> The right of floatage is one of the innumerable limitations or qualifications by which, in a state of civilized society, we are compelled to yield something of our absolute rights with respect both to person and property, and to enjoy those rights in some degree in subordination to the rights of others. The owner of timber, for instance, upon the upper reaches of a stream, would find his property diminished in value were he not permitted to use the waterway which nature

---

[51] Mead v. Haynes, 24 Va. 33 (1824); Miller v. Commonwealth, 166 S.E. 557, 558-59 (Va. 1932) ("[The English common law doctrine was] applicable to grants made by the company, the Crown, or the Commonwealth, of lands along the tidal waters in Virginia, unless and until changed, modified, or in effect abrogated by some duly constituted authority."); James River & Kanawha Power Co. v. Old Dominion Iron & Steel Corp., 122 S.E. 344, 346 (Va. 1924) (recognizing English common law rule that grant of non-tidal water extends to thread of stream). *See also*, Gaston v. Mace, 10 S.E. 60, 66 (W.Va. 1889) (construing Virginia law and finding English common law unchanged as to western part of state until 1802); Berry v. Snyder, 66 Ky. 266, (1867) (holding that the Ohio river conveyed to streambed by Commonwealth of Virginia, because English common law rule unchanged at time of conveyance).

[52] *Kraft*, 476 S.E.2d at 716-17; Commonwealth v. Morgan, 303 S.E.2d 899, 901-02 (Va. 1983); Miller v. Commonwealth, 166 S.E. at 558-59; James River & Kanawha Power Co., 122 S.E. at 346 (recognizing English common law rule that grant of non-tidal water extends to thread of stream); 1 MINOR, *supra* note 50; Shively v. Bowlby, 152 U.S. 1 (1894).

[53] Hayes's Ex.'or v. Bowman, 22 Va. 417 (1823); A.E. Ewell v. Lambert, 13 S.E.2d 333, 336 (Va. 1941).

[54] *See, supra* note 52.

[55] Hot Springs Lumber & Mfg. Co. v. Revercomb, 55 S.E. 580, 581 (Va. 1906*), rev'd on other grounds* 65 S.E. 557 (Va. 1909).

> has provided. Riparian owners, therefore, upon the lower parts of the stream, must submit to this use as an incident of their ownership of lands situated upon a navigable stream.[56]

The Court ultimately found that the river was not floatable, because logs could not be moved down the Jackson River unless the water was high.[57] Interestingly, the record from this case was used at the district court level in *Loving v. Alexander* to support a finding that the river was used for commerce and thus navigable under the federal test for navigability.[58] *Revercomb* is at odds with *Loving*, as it decided that the Jackson River did not have commercial use requiring a right to public access. *Revercomb* is interesting in that private ownership of part of the river was presumed.

2. Boerner v. McAllister

In *Boerner v. McAllister*, a landowner along the Jackson River sought a permanent injunction to bar a third party from fishing on his property.[59] The fisherman challenged whether the landowner actually owned the land under the river and asserted that he had a right to fish in the Jackson River because it is a navigable stream.[60] The Supreme Court of Virginia found that the river was capable of private ownership on the basis of English common law.

> At the time of the grant (between 1749 and 1751) there was no law preventing the conveyance of 'the rivers, waters and water courses therein contained', therefore the grantee took title under the grant in this case to that part of Jackson River within the grant. The common law of England continues in force in this jurisdiction except as altered by the General Assembly. § 1-10, Code of Virginia, 1950. It has not been changed by statute so as to affect the ownership of the beds of streams granted prior to 1780 where the land lies in the eastern or tidewater section, or granted prior to 1802 where the land lies in the western part of the State, the situs of the present proceeding.[61]

Boerner is notable for covering both Crown *and* Commonwealth grants as the 1802 date quoted carries such grants past Virginia's colonial era and into early statehood. Further, *Boerner* also provided a framework for understanding Virginia's reservation of common lands by stating that the Jackson River falls in the western part of the state under the 1802 statute reserving submerged lands.

The owner of the riverbank argued that the Jackson River was floatable and thus fishing could not be restricted. The Supreme Court found that whether the river was floatable was a question of fact, but even if the river were floatable, there was persuasive authority to the effect that fishing could still be restricted.[62] This latter question foreshadows confusion over whether rivers are navigable and the intersection between federal and state law.

3. Kraft v. Burr

In *Kraft v. Burr*, the Supreme Court of Virginia held that even where a river is navigable, a Crown

[56] *Id.* at 583.
[57] *Id.* at 557.
[58] Loving v. Alexander, 548 F.Supp. 1079, 1084 n.4 (W.D. Va. 1982).
[59] 89 S.E.2d 23, 24 (Va. 1955).
[60] *Id.* at 24.
[61] *Id.* at 26.
[62] *Id.* at 27.

Grant may convey exclusive fishing rights. Kraft, who was charged with fishing on private property, claimed that the right to fish could not have been conveyed away because the King held the right to fish and other rights in trust for the public, *jus publicum*.[63]

Interestingly, instead of relying on the rationale that the river was non-navigable, the Court relied on the proposition that the King also had the power to grant land under navigable waters, and the power to grant away fishing rights.[64] The Court then relied on *Boerner* to find also that the Crown had the power to grant the land at issue at the time the grant was made.[65] *Kraft* then also contributes to confusion over navigability, by labeling the Jackson River navigable and for discussing whether the river is navigable in addition to relying on *Boerner.*

D. Ownership of Virginia's Shores and Crown Grants Along Tidal Waters

More complicated questions surround grants along tidal waters. A trio of cases set forth Virginia's law on Crown and Commonwealth Grants along tidal waters. The cases demonstrate the ways in which Virginia courts created their own view of English common law, as the Supreme Court of Virginia was required to resolve the question whether the British sovereign could convey land under navigable rivers. It used its own interpretation of English common law in reaching its decision. The Supreme Court of Virginia often relied on *American* interpretations of English common law rather than looking at the common law itself. Indeed, in *Miller v. Commonwealth*, the Supreme Court of Virginia undertook an extensive discussion of English common law without substantial reliance on sources and without citation.[66]

Crown and Commonwealth Grants along tidal rivers may convey to the high water mark, but whether such a conveyance may be presumed from a Crown or Commonwealth Grant has varied among Virginia decisions.[67] Central to the disagreement among Virginia cases regarding the presumptions attached to a Crown or Commonwealth grant on tidal waters is the Case (or Rule) of Robert Liny recorded in 1679, which Virginia courts have treated as a legislative change to English common law.[68] The Case of Robert Liny provides as follows:

> ROBERT Liny haveing complained to this grand assembly, that whereas he had cleared a ffishing place in the river against his owne land to his greate cost and charge supposing the right thereof in himselfe by virtue of his pattents, yett neverthelesse severall persons have frequently obstructed him in his just priviledge of ffishing there, and in despight of him came upon his land and hale their sceanes on shore to his greate prejudice, aleadging that the water was the kings majesties, and not by him granted away in any pattent, and therefore equally free to all his majesties subjects to ffish in and hale their sceanes on shore, and praying for releife therein by a declaratory order of this grand assembly; it is ordered and declared by this grand assembly that every mans right by vertue of his pattent extends into the rivers or creekes soe farre as low water marke, and it is a priviledge granted to him in and by his pattent, and that therefore noe person ought to come and ffish there above low water marke or hale their

[63] Kraft v. Burr, 476 S.E.2d 715, 716 (Va. 1996).
[64] *Id.* at 716-17.
[65] *Id.* at 717.
[66] *See* discussion *infra* Section II.D.2.
[67] *See* discussion *infra* Sections II.D.1-3.
[68] Taylor v. Commonwealth, 47 S.E. 875, 880 (Va. 1904) (referring to the Order of Robert Liny as a statute and not mentioning by name). *See also*, Waverly Water-Front & Imp. Co. v. White, 33 S.E. 534, 536 (Va. 1899) (referring to Order of Robert Liny as a statute).

> sceanes on shore (without leave first obtained) under the hazard of committing a trespasse, for which he is sueable by law.[69]

Debate over the Case of Robert Liny turns on whether the Case is simply a decision regarding a particular dispute or a legislative enactment.[70] The text supports an idea of general applicability stating, "it is ordered and declared by this grand assembly that every mans right by vertue of his pattent extends into the rivers or creekes soe farre as low water marke…"[71] Yet the Supreme Court of Virginia first relied on the decision in *Taylor v. Commonwealth* and then reversed course, declaring the Case of Robert Liny to be without force and effect.

1. Taylor v. Commonwealth

In *Taylor v. Commonwealth*,[72] the Supreme Court considered what it called a question of first impression: "In this case, for the first time, this court has been called upon to deal with conflicting rights of the riparian proprietor and the commonwealth…"[73] A private landowner sought to claim land between the low water mark and line of navigability, or channel, under a crown grant on the York River in Gloucester County.[74] The Commonwealth argued that the private landowner owned only to the high watermark.[75] The parties did not appear to challenge the navigability of the river.[76]

The Supreme Court of Virginia began by considering "the power and authority, the interest and the title, of the English crown in the soil under the tidal waters of that realm" and the power of the Crown to grant such lands after the Magna Carta.[77] Interestingly, the Court drew this analysis not from English sources, but began with a discussion of *Martin v. Waddell*,[78] Virginia cases, and cases from other states.[79] The Court's discussion foreshadowed future assertions of the public trust doctrine, in questioning whether the Commonwealth could grant away land that would be useful to the public.[80] Only after reviewing English common law through the lens of federal and state cases did the *Taylor* Court confirm its reasoning with reference to decisions from the House of Lords.[81]

The *Taylor* Court considered the Case of Robert Liny without questioning whether the Case was a statute, and determined that English common law had been varied and that "[t]he fee-simple title, therefore, of a riparian owner ends with [the] low-water mark."[82] In a move that foreshadowed the division between state and federal law, the *Taylor* Court also drew a difference between state

---

[69] 2 WILLIAM WALLER HENING, THE STATUTES AT LARGE 456 (1823). The Case of Robert Liny was put in the text of April, 1679 in Hening's statutes, published 1823.
[70] *See infra* Sections III.D.1-3.
[71] 2 HENING, *supra* note 69, at 456.
[72] 47 S.E. 875 (Va. 1904).
[73] *Id.* at 882. The matter also concerned a claim by the landowner against an artesian water company that had drilled a well in land claimed by the private landowner, and the landowner's claim to be able to take additional lands under an unrelated statute. *Id.*
[74] *Id.* at 876.
[75] *Id.* at 879.
[76] *Id.*
[77] *Id.* at 878.
[78] 41 U.S. 367, 410-11 (1942). (holding in relevant part that the King of England had the power after the Magna Carta to grant submerged lands to private individuals).
[79] *Taylor*, 47 S.E. at 878-80.
[80] *Id.* at 779-80.
[81] *Id.* at 881.
[82] *Id.* at 780.

ownership of lands and the right of navigation that had been granted to the federal government.[83] The Court determined that the private landowner possessed the real property at issue up to the low water mark and that she had a limited right to access the river up to the line of navigation. Though not explicitly stated as a presumption, the message of *Taylor* is that ownership to the low water mark is part and parcel of the English common law rights that accompany a Crown grant.[84]

2. Miller v. Commonwealth

The Supreme Court of Virginia took up a similar question in *Miller v. Commonwealth*, but its interpretation of English common law and the Case of Robert Liny led it to impose a very different analysis. *Miller* involved an appeal from a criminal prosecution for hunting on private property, and turned on whether one of the parties could prohibit others from "hunting (fowling)" on land between the high and low water marks of an island in a tidal section of the James River.[85]

The *Miller* Court began by reviewing English common law and the powers of the Crown without significant citation to English authority and concluded:

> the presumption was that the king had not granted, and did not intend to include within the limits of a grant made by him, lands lying between high and low-water marks, where the grant called for the sea, or a tidal bay, river or creek, as the boundary of the land granted...[86]

The *Miller* Court founded its reasoning on the system of head, treasury, and military rights in Colonial Virginia, which permitted an individual to receive a certain acreage of land from the Crown.[87] An individual receiving such a grant had to pay a quit rent every year on their acreage, and thus the incentive to early recipients of land grants would have been to claim arable land.[88]

The *Miller* Court further departed from the reasoning of the *Taylor* Court with its interpretation of the Case of Robert Liny. It stated "we are of opinion that the Robert Liny order was not a legislative enactment which changed the rules of the common law relative to crown grants of land on tidal waters."[89] By viewing the Case of Robert Liny as the resolution of a particular dispute, rather than a legislative enactment, the *Miller* Court did not read any presumption of ownership to the low water mark into English common law.

In spite of its substantial deviation from the reasoning of *Taylor*, the *Miller* court ultimately concluded that the particular grant at issue extended below the high water mark, noting:

> [S]ome grants were made, the line of which crossed tidal rivers and creeks, and clearly 'comprised within the limits' thereof all or a portion of a tidal river or creek. Such grants at common law passed the title to the land between high and low-water marks within the limits thereof, and were clearly recognized as having done so by the act of February 16, 1819, and subsequently legislation on this subject.[90]

---

[83] *Id.* at 878.
[84] *Id.* at 882.
[85] 166 S.E. 557, 558 (Va. 1932).
[86] *Id.*
[87] *Id.* at 560.
[88] *Id.*
[89] *Id.* at 562.
[90] *Id.* at 559.

Thus, under *Miller,* a normal Crown or Commonwealth Grant conveys to the high water mark and a Crown or Commonwealth Grant may be shown by its terms to extend further.[91]

Miller also appears to acknowledge a third category of Crown/Commonwealth Grants. The *Miller* Court noted in brief that it had discovered grants in its research that conveyed to the low water mark or into salt marshes by their terms.[92] Yet, the Court is unclear on what distinguishes these grants from those made under treasury, military, and head rights, or those that extend beyond the low water mark because of the property description. This last, inchoate category of land grants remains a question mark in Virginia law. It may have been the *Miller* Court simply attempting to leave further room for development of the common law, or there may in fact be some third type of conveyance.

3. Morgan v. Commonwealth

The Supreme Court of Virginia most recently addressed private ownership of land between the low and high water marks in *Morgan v. Commonwealth*.[93] *Morgan* involved a declaratory judgment action between individuals and the Commonwealth over who owned certain oyster beds on Carter's Cove, a tributary of the Rappahannock River.[94]

The *Morgan* Court explicitly noted that Virginia had created its own common law on English common law, stating that Virginia had already sided with the portion of the debate over English common law that determined that beds of navigable waters could be granted.[95] The *Morgan* Court did not directly discuss the Case of Robert Liny, but applied *Miller* and not *Taylor.*[96]

The evidence brought by the party claiming private landownership included copies of the land patents as well as the testimony of a land surveyor that the cove fell within the land described by the colonial patents and an 1815 plat made of the property.[97] The Court credited that evidence and found that the landowner possessed real property to the low water mark.[98]

E. Until Altered by Statute

The common law of England remained in force in Virginia until it was altered by statute. The Virginia legislature enacted a string of limitations on the power of the Land Office, the arm of the early Commonwealth charged with granting land.[99] In 1792, the legislature limited the power of the state to grant certain submerged lands in the eastern part of the state and by 1802 the state had reserved all ungranted streambeds to itself.[100]

The Commonwealth's reservation of land around waters began with a 1780 statute that is more limited on its face than future reservations:

---

[91] Notably, in 1819, the Virginia General Assembly extended landownership rights from the high water mark to the low water mark. However, whether that ownership is a product of a Crown grant or a Commonwealth grant matters as at least with regard to the Crown Grant, a landowner has the power to exclude certain public uses, including hunting, fishing, and fowling. *See* Kraft v. Burr, 476 S.E.2d 715, 718 (Va. 1996).
[92] Miller, 166 S.E. at 559 n.1 & 3.
[93] 303 S.E.2d 899 (Va. 1983).
[94] *Id.* at 899.
[95] *Id.* at 901.
[96] *Id.*
[97] *Id.* at 900.
[98] *Id.*
[99] Miller v. Commonwealth, 166 S.E. 557, 565 (Va. 1932) (quoting statutes); 1802 Va. Acts 423 (Appendix B).
[100] 1802 Va. Acts 423 (Appendix B).

> Whereas certain unappropriated lands on the bay, sea, and river shores, in the eastern parts of this commonwealth, have been heretofore reserved as common to all the citizens thereof, and whereas by the act of general assembly entitled 'An act for establishing a land office, and ascertaining the terms and manner of granting waste and unappropriated lands,' no reservation thereof is made, but the same is now subject to be entered for and appropriated by any person or persons; whereby the benefits formerly derived to the public therefrom will be monopolized by a few individuals, and the poor laid under contribution for exercising the accustomed privilege of fishing: Be it therefore enacted by the General Assembly, That all unappropriated lands on the Bay of Chesapeake, on the sea shore, or on the shores of any river or creek in the eastern parts of this commonwealth, which have remained ungranted by the former government, and which have been used as common to all the good people thereof, shall be, and the same are hereby excepted out of the said recited act, and no grant issued by the register of the land office for the same, either in consequence of any survey already made, or which may hereafter be made, shall be valid or effectual in law, to pass any estate or interest therein.[101]

This statute reserved common lands only "on the sea shore, or on the shores of any river or creek in the eastern parts of this commonwealth." By its very terms it does not reserve the streambeds of waters.[102]

In 1792 the General Assembly reserved the submerged lands, adding the language "and the bed of any river or creek" to the statute:

> That all unappropriated lands on the bay of Chesapeake, on the sea shore, or on the shores of any river or creek, and the bed of any river or creek in the eastern parts of this Commonwealth, which have remained ungranted by the former government, and which have been used as a common to all the good people thereof, shall be, and the same are hereby excepted out of this act; and no grant issued by the register of the land office for the same, either in consequence of any survey already made, or which may hereafter be made, shall be valid or effectual in law to pass any estate or interest therein.[103]

In 1802 the legislature extended its reservation to the western part of the state:

> I. WHEREAS it hath been represented to this present General Assembly, that many persons

[101] *Miller,* 166 S.E. at 565 (quoting statutes).

[102] Parties and courts have attempted to read into the 1780 statutes a reservation of streambeds. The Supreme Court of Virginia's most recent statement directly on this issue has been to treat the 1780 statute as its language would require: as only reserving the banks of waterways. *Id.* at 566. This fits with the principle of judicial restraint and modern principles of statutory interpretation, which in Virginia assume that a legislature in fact meant what it said. *See* Grillo v. Montebello Condominium Unit Owners Association, 416 S.E.2d 444, 445 (Va. 1992) (stressing that courts will not adopt a construction which amounts to holding that the legislature did not mean what it actually expressed); Turner v. Wexler, 418 S.E.2d 886, 87 (Va. 1992); Equity Investors Ltd. v. West, 425 S.E.2d 803, 804 (Va. 1993).

There has also been significant debate as to the meaning of "unappropriated lands" and lands used as commons in this and related statutes. In *Miller v. Commonwealth*, the court concluded that commons were lands designated as commons or well understood to be commons, and thus a "restricted" set of lands as opposed to all lands that might be used as commons. 166 S.E. at 565. By contrast, similar language as to commons in a related 1888 statute was understood to apply to a much broader class of lands. *See generally*, Bradford v. Nature Conservancy, 294 S.E.2d 866 (Va. 1982).

[103] *Miller*, 166 S.E. at 565-66.

> have located, and lay claim in consequence of such location, to the banks, shores and beds of the rivers and creeks in the western parts of this commonwealth, which were intended and ought to remain as a common to all the good people thereof: II. *Be it therefore enacted*, That no grant issued by the register of the land office for the same, either in consequence of any survey already made, or which may hereafter be made, shall be valid or effectual in law to pass any estate or interest therein
>
> II. THIS act shall commence and be in force, from and after the passing thereof.[104]

Notably, the 1802 Act does not purport to apply retroactively, but rather by its express terms only is in force "after the passing thereof." It thus leaves the terms of prior grants untouched. Some form of the reservation of submerged lands statute has remained in force since that time.[105]

The Supreme Court of Virginia in *Boerner v. McCallister* adopted a rule whereby the Jackson River falls in the western part of the state.[106] The *Boerner* Court's ruling is consistent with a 1779 statute governing the Land Office that divided the state into eastern and western divisions.[107]

F. Summary

Under Virginia law, whether land under a stream is susceptible to private ownership depends on its geographic location and the time period of conveyance (Table 1). Before 1780, English common law governed all parts of the state. By 1792, the legislature reserved the streambed in the eastern part of the state and thus such ownership is governed at least in part by statute. From 1792 to 1802, the eastern and western parts of the state were subject to different law on conveyances. By 1802, the legislature reserved all ungranted parcels of property.

Table 1. Law Applicable to Waterways

	Pre-1780	1780-1792	1792-1802	After 1802
Eastern Part of State	English Common Law	Statute as to Banks of Land Used in Common; Otherwise English Common Law	Statute	Statute
Western Part of State	English Common Law	English Common Law	English Common Law	Statute

Under existing interpretations of the English common law as to tidal waters, land is presumptively conveyed to the high water mark. A conveyance of mud flats, tidal marshes, and land below the low water mark may be proved by a property description or by extrinsic evidence. The Case of Robert Liny, though it pops up in various Virginia cases, does not appear to be good law based on *Miller* and *Morgan*. For non-tidal rivers, an owner of one bank of a river or stream owns one side of the river or streambed; the owner of both banks owns the entirety of the bed.

---

[104] 1802 Va. Acts 423 (Appendix B). The reservation of commons as areas that "were intended … to remain as a common" is interesting in light of the difference in interpretative approach between the *Miller* Court and the *Bradford* Court. It is unclear whether "intended" commons were areas specifically known or whether a particular class of land such as riverbeds was known to be intended as commons.

[105] *See* VA. CODE ANN. § 28.2-1200.

[106] 89 S.E.2d 23, 26-27 (Va. 1955) (*citing* Gaston v. Mace, 10 S.E. 60, 66 (W.Va. 1889).

[107] 2 Va. Rev. Code of 1819 354-65; *see also* 8 HUDGINS, *supra* note 24, at vii-xix.

Table 2. Presumptions Associated with Classes of Rivers

	English Common Law
Tidal	• Conveys to high water mark by common law; • 1815 extended some property rights to low water mark; • Particular grants may be show to convey farther.
Non-Tidal	• Owner of one stream/riverbed owns to middle thread of water; • Owner of both sides of waterway owns entirety of streambed.

IV. Virginia's Administrative Law and the Executive Presumption of Ownership

In 1982 the Virginia Attorney General, John Coleman, set out the executive department of Virginia's presumptions with regard to land ownership of submerged land in an Attorney General's Opinion defining the jurisdiction of the Virginia Marine Resources Commission (VRMC).[108] The Opinion provides that the jurisdiction of the VRMC is based on the Commonwealth's title and "extends to the beds of all the bays and ocean, rivers, streams and creeks in every part of the Commonwealth unless they have been lawfully granted to others."[109] The presumption is that "[s]ince the Commonwealth has title unless it has been lawfully conveyed, the Commission should presume that it has jurisdiction over any subaqueous bed in the Commonwealth until someone else shows title to the bed derived from a grant from the king or the Commonwealth."[110] Landowners bear the burden of proving their ownership of private lands, as the position of the Commission is to "assume that the Commonwealth does own the bottom until it receives proof … that the Commonwealth no longer has title to the parcel in question."[111]

The Attorney General's Opinion classifies submerged lands in Virginia under a system that ignores or is in direct conflict with the decisions of the Supreme Court of Virginia. It provides:

> 1. Under tidal waters. The Commission has jurisdiction over the beds of all tidal waters except where a final court decision has otherwise determined, and the Commission should be prepared to defend its jurisdiction in court if necessary.
>
> 2. Under non-tidal waters. The Commission should assume that all streams above some administratively determined minimum size are navigable-in-fact until evidence is presented proving non-navigability.
>
> The question of navigability is a question of fact as to whether a stream is being or has been historically used as a highway for trade and travel or whether it is capable of such use in its ordinary and natural condition (*i.e.*, disregarding artificial obstructions such as dams which could be abated). *Ewell*, *supra*, at 228; *Crenshaw v. The Slate River Company*, 27 Va. (6 Rand.) 271 (1828).
>
> A. Navigable-in-fact. The Commission should assume jurisdiction unless the landowner can show title to the riparian land acquired by grant prior to July 4, 1776.

---

[108] Op. Va. Atty. Gen. 242 (1981-82). There is also persuasive authority to the effect that the VMRC's power is rooted in the state police power. *See* Keith Warren Davis, *The Role of the Virginia Marine Resources Commission in Regulating and Zoning the Water Bodies of the Commonwealth*, 16 WM. & MARY ENVTL. L. & POL'Y REV. 81, 84-86 (1992).

[109] Op. Va. Atty. Gen. 242 at *1

[110] *Id.*

[111] *Id.* at *2-3.

> B. Non-Navigable-in-fact. The Commission should assume jurisdiction unless the landowner can show a grant prior to 1792 in that part of the State draining toward the Atlantic Ocean, or prior to 1802 in that part of the State draining toward the Gulf of Mexico.[112]

The scope and nature of the Opinion and the VRMC authority is of import because the Attorney General is claiming title for the Commonwealth through this opinion and because the VRMC has broad regulatory authority to zone watercourses, issue permits allowing uses of the submerged lands, disallow uses, and may limit the construction of piers, wharves, and dams.[113]

By using the navigable-in-fact test, the Attorney General's Opinion ignores that the test for determining the rights conveyed with a Crown or early Commonwealth Grant turns on whether a river is navigable or non-navigable under English common law.[114] Use of the Attorney's General Opinion will, in some cases, classify lands that are privately owned as public.

The precedent relied upon by the Opinion is not on point. The cases cited do not purport to concern a Crown Grant or do not expressly deal with tests for public use of the flow of the river as opposed to private ownership of submerged lands.[115] The Attorney General's Opinion cites to a secondary source, Embrey's Water's of the State, for the division of the state between eastern and western parts.[116] It ignores the Supreme Court's classifications in *Boerner*, which is both more recent and better authority, and the statute regarding the Land Office which specifically sets out eastern and western divisions of the state.[117]

Finally, the Attorney General's opinion fails to acknowledge that the Commonwealth could and did grant lands under what are in contemporary terms "navigable lands." The Supreme Court of Virginia expressly acknowledged this in *Boerner v. McCallister.*[118] And while this may once have been a question of law, it has now been settled many times by the Supreme Court of Virginia that Commonwealth

---

[112] *Id.* at *3.

[113] *See, e.g.*, VRMC, *Subaqueous Guidelines*, http://www.mrc.state.va.us/regulations/subaqueous_guidelines.shtm (last visited Dec. 1, 2012); 4 VA. ADMIN. CODE § 20-120-10 *et. seq*. ("Pertaining to the Promulgation of a Public Notice on Applications to Encroach In, On, or Over Subaqueous Lands of the Commonwealth").

[114] *See, e.g.*, Mead v. Haynes, 24 Va. 33, 33 (1824).

[115] The opinion relies on *Ewell v. Brock* for the proposition that navigability-in-fact is the appropriate test. But *Ewell* did not state whether the grant at issue was a Crown grant or some other form of grant. But understandings of what is navigable have evolved over time. *Compare Mead*, 24 Va. at 33 (highlighting distinction between tidal and non-tidal rivers), *with* Boerner v. McAllister, 89 S.E.2d 23, 23 (Va. 1955) (noting floatable rivers and those navigable-in-fact). However, that it has evolved does not mean that grants from a prior time period should be judged on the basis of later law. As argued elsewhere, to do so is to effectuate a taking. The Attorney General's Opinion erroneously relied on *Old Dominion Iron & Nail Co. v. Chesapeake and Ohio Ry. Co.*, 81 S.E. 108 (Va. 1914), for the proposition that later Virginia law applies to determining whether a river is navigable under a Crown Grant as proposed to English common law. The Supreme Court of Virginia in *Old Dominion Iron & Nail Co.* expressly declined to rule on the question of what law applied, but decided the matter on the grounds that the private landowner had waited too long to raise their claim to private property in light of historical exercises of use by the Crown. *Id.* at 108-09. Finally the Attorney General's Opinion relies on *Crenshaw v. The Slate River Company*, 27 Va. 245 (1828). However, *Crenshaw* expressly dealt with the public *use* of the river and explicitly distinguished this use of the river from the question of ownership of submerged lands. *Id.* at 262.

[116] *Compare* Op. Va. Atty. Gen. 242 at *1 (dividing state based on whether water drains to the west (Mississippi River) or east (Atlantic Ocean)), *with* Boerner, 89 S.E.2d at 26 (Jackson River in western part of state).

[117] 2 Va. Rev. Code of 1819 354-65; 8 HUDGINS, *supra* note 24, at vii-xix.

[118] *Boerner*, 89 S.E.2d at 26.

Grants could and did convey submerged lands in tidal waters.[119]

In short, the Attorney General's Opinion adopts views directly contrary to settled Virginia law and ignores a decision by the Supreme Court of Virginia in order to rely upon a secondary source. The thirty-year-old opinion remains the source of the VMRC's regulations and its classification system of land.[120] This places administrative policy on a collision course with individuals' private rights by requiring individuals to prove up their ownership. By incorrectly classifying land as incapable of private ownership, the state government sets up not only conflict with private landowners but burdensome litigation.

V. Process makes Imperfect

Virginia substantive and procedural law require a case-by-case analysis as to the ownership of parcels of Crown or Commonwealth grants. The level of proof required by a court varies depending on the parties to the case, and the questions at issue. Where two parties claim to have title to an action, a landowner will need to demonstrate superior title in the form of chain of title tracing back to a Crown or Commonwealth Grant.[121] This is most likely to arise in a dispute between the Commonwealth of Virginia and a private landowner, given the Commonwealth's presumption of ownership of many submerged lands. In a suit against a trespasser who claims no right of title in himself, a landowner need only show *prima facie* title.[122] Within the context of a Crown or Commonwealth Grant, this requires a showing of prior possession under color of title and a showing that the Crown or Commonwealth Grant was capable of conveying the land.[123] Where a landowner lays claim to more than is presumed to have been conveyed under English common law, as in *Miller*, additional evidence such as surveys may be required.[124] Finally, additional litigation is likely required to determine whether some land grants convey beyond the high-water mark on tidal waters by their terms and do not require proof by extrinsic evidence, as hinted at in *Miller*.[125]

VI. Conclusion: The Increased Cost of Regulation

The likelihood that the state will treat privately owned land as public and the state's failure to acknowledge certain lands as susceptible to private ownership leads to the likelihood that the state will effectuate an actual or regulatory taking. Quite simply, if policy makers do not know what land is public and what land is private, they cannot accurately predict the costs of their legislation or regulations. For example, if rivers were to swell as a result of rising waters due to global warming, the state may prohibit

---

[119] Notably these decisions predate the Attorney General's Opinion. City of Roanoke v. Elliott, 96 S.E. 819 (Va. 1918) ("Undoubtedly there are certain public uses of navigable waters which the state does hold in trust for all the public, and of which the state cannot deprive them, such as the right of navigation, but, subject to these public rights, there is no reason why the beds of navigable streams may not be granted, unless restrained by the Constitution."); James River & Kanawha Power Co. v. Old Dominion Iron & Steel Corp., 122 S.E. 344, 346 -47 (Va. 1924) ("[T]he Legislature has the power to dispose of such beds and the waters flowing over them subject to the public use of navigation, and such other public use, if any, as is held by the state for the benefit of all the people.").

[120] *See* VRMC, *Subquaceous Guidelines*, http://www.mrc.state.va.us/regulations/subaqueous_guidelines.shtm (last visited Dec. 1, 2012).

[121] Kraft v. Burr, 476 S.E.2d. 715, 719 (Va. 1996).

[122] *Id.*

[123] *Id.*

[124] *See supra* Section III.D.2.

[125] Miller v. Commonwealth, 166 S.E. 557, 559 n. 1 & 3 (Va. 1932).

the construction of any structures that extend into the water.[126] This could amount to a regulatory taking, requiring the Commonwealth to expend large amounts of money.

The Virginia courts' case-by-case analysis of Crown and Commonwealth grants imposes costs on private landowners by requiring them to establish what they own. Interestingly, in spite of the direct conflict between the Attorney General's Opinion and settled law on property ownership, the Commonwealth has not been a party to a case regarding Crown or Commonwealth Grants that has gone to the Virginia Supreme Court since *Commonwealth v. Morgan* in 1983.[127] Contests involving Crown and Commonwealth Grants have instead involved landowners and alleged trespassers. For example, *Kraft v. Burr* involved landowners and trespassers.[128] Two private parties, landowners and alleged trespassers, thus pay the costs of the Attorney General's Opinion. However, a direct challenge to the Commonwealth is likely to occur if the state enacts systematic legislation to address changes in river levels or the erosion of the sea shore in the eastern parts of the state while still presuming ownership of all land under "navigable" waters.

Finally Virginia's treatment of Crown and Commonwealth Grants is necessarily static, pun intended, in the fluid world of rivers, streams, and shores. By recognizing early Commonwealth and Crown Grants as occurring under English common law, the Supreme Court of Virginia effectively has frozen English common law under the Takings Clause. Virginia's subsequent common law evolution as to rivers and streams, if applied to early grants, potentially deprives individuals of their land rights. More fundamentally, these are decisions that regulators and legislators must come to terms with before imposing broad authority.

Virginia has further used a static view of land and shores in attempting to locate boundaries of property. For example, in *Bradford v. Nature Conservancy*, the Supreme Court of Virginia determined property rights over a barrier island along Virginia's coast with reference to the location of marshes.[129] However, marshes, coastlines, and mudflats can relocate on an island.[130] This problem is heightened in the face of potential climate change, erosion, and rising tides. Movement and change in geographic features can create difficulty in locating traditional commons and boundary lines.

An important first step in approaching these problems is to bring Virginia state policy in line with the decisions of the Virginia courts. While this will not alleviate the costs of the case-by-case analysis required by Virginia law and will not eliminate some of the doubt and unpredictability as to the location of Crown and Commonwealth Grants, it will lessen some of the collisions between state policy and the rights of private landowners.

---

[126] Pressing private property into a public reservation of property may amount to a taking. *See* Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

[127] Commonwealth v. Morgan, 303 S.E.2d 899 (Va. 1983); *see also* Moorman, *supra* note 5.

[128] 476 S.E.2d 715.

[129] 294 S.E.2d 866 (Va. 1982).

[130] Moorman, *supra* note 5, at 474, 485 (noting that island at issue had drastically changed as a result of storms).

Colonial Property, Private Dams, and Climate Change in Virginia

Jill Fraley[1]

Abstract: Dams have been a significant part of flood prevention and management systems in the United States, dating back to the systematic efforts of the Tennessee Valley Authority and, less systemically, long before that. Dealing with flood management in Virginia presents unique challenges because of a colonial legacy that allows most dams in Virginia to be privately owned. Through a mechanism called King's Grants, some Virginia landowners hold title not simply to property surrounding a navigable waterway, but also to the soil beneath the river and to dams crossing the river. Such ownership of the soil of large, navigable waterways is unique to this particular type of land grant as it has been construed by the Virginia Supreme Court. Dam management is a significant issue for public safety for two reasons. First, roughly 20% of Virginia's dams fall within the high hazard category, which means that significant loss of life and property would result from a breach. With climate change indicating a greater likelihood of high magnitude storms, dam failures are all the more anticipated. Private ownership causes unique challenges in this regard because expenses of dam renovations tend to far exceed the means of private landowners who hold title to roughly three-fifths of the dams in the state. Second, flood management requires coordinated and comprehensive action, which is a far greater logistical challenge when dams are managed and operated by more than a thousand individual landowners within the state. Despite those challenges, this article argues that such a comprehensive approach is the only option in the face of significant storm risks and sea level rise.

I. Introduction

Quite reasonably, few texts attempt to address the breadth and complexity of property rights created in the early American colonies. Charters and grants established property in North America just as many feudal systems of property were disappearing within England.[2] Additionally, the British Crown

[1] Assistant Professor of Law and Director, Center for Law & History, Washington & Lee University School of Law.
[2] Will Sarvis, *Land and Home in the American Mind*, 22 J. NAT. RESOURCES & ENVTL. L. 107, 116–17 (2008–09) ("To some extent the states of the eastern seaboard continued an ancient Anglo and European practice which, in some cases, had begun to disappear in the Old World.").

repeatedly altered its approach to grants and charters to fit the types of resources and economies of its colonies by, for example, switching from initial claims to mines of silver and gold to seeking profits from agricultural activities.[3] The inheritance of a system itself in a period of substantial transformation combined with an attitude of experimentation within the colonial enterprise to generate a rich variety of property rights within the new colonies.[4] Some of those rights have decreased in significance over time, but in other circumstances unusual rights have remained or even increased in significance. One such example of the latter case is private ownership of navigable rivers and their subaquatic soils.

The point of departure within the British common law and also within United States law is that navigable waterways and their subaquatic soils are vested in the sovereign for the use of the public as a whole.[5] Within Virginia, the state Supreme Court has held that such rights may have been alienated from the public prior to the American Revolution through a specific type of grant known locally as a King's grant.[6] As a result, navigable rivers in Virginia may be claimed by private parties, who in many cases own private dams. This article describes the history of such private rights within Virginia and examines the consequences of private ownership and operation of dams for the management of floods and extreme storms, which are anticipated to increase substantially with climate change.

II. Unique Colonial Property: The King's Grant

A. Property in Rivers and Submerged Lands

Within the British common law at the time of the American Revolution, property rights in rivers, submerged waters, and fisheries depended primarily on the categorization of the river as navigable or non-navigable. As John Davies explained in 1762,

> There are two kinds of rivers; navigable and non navigable. Every navigable river, so high as the sea flows and ebbs in it, is a royal river, and the fishery of it is a royal fishery, and belongs to the king by his prerogative; but in every other river non navigable, and in the fishery of such river, the ter-tenants on each side have an interest of common right.[7]

---

[3] *See* Robert J. Miller, *The International Law of Colonialism: A Comparative Analysis*, 15 LEWIS & CLARK L. REV. 847, 869 (2011) (stating that the 1670 royal charter granted to the Hudson's Bay Company enabled the Company to make discoveries regarding minerals); *see also* Gary D. Libecap, Dean Lueck, and Trevor O'Grady, *Large-Scale Institutional Changes: Land Demarcation in the British Empire*, 54 J.L. & ECON. S295, S298 (2011) (starting in the mid-seventeenth century, the British refocused their attention on New World lands).

[4] Olivier De Schutter, *The Green Rush: the Global Race for Farmland and the Rights of Land Users*, 52 HARV. INT'L L. J. 503, 528 (2011) (stating that the "unequal agrarian structures inherited from the colonial era" made titling lands in America more complex).

[5] *See* Martin v. Lessee of Waddell, 41 U.S. 367 (1842) (stating that the land grant to the Duke of York is held by the king in trust for his people).

[6] *See* Kraft v. Burr, 476 S.E.2d 715 (Va. 1996) (holding that the King had power to convey land under navigable waters to private persons).

[7] JOHN DAVIES, A REPORT OF CASES AND MATTERS IN LAW: RESOLVED AND ADJUDGED IN THE KING'S COURTS IN IRELAND 152 (1762).

Thus, non-navigable rivers, by default, transferred with the surrounding property. Fishery rights naturally accompanied such rights to the underlying soils.[8]

Under British law, the basic approach to property was that the King "was the ultimate owner of all the lands he ruled."[9] Therefore, the navigable rivers were held in trust for the public as a whole by the King. While the King was owner of such property, "the common people of England have regularly a liberty of fishing in the sea, or creeks, or arms thereof, as a public common of piscary, and may not, without injury to their right, be restrained of it."[10] Such rights could be abrogated within "creeks or navigable rivers," but only where "either the king or some particular subject hath gained a propriety exclusive of that common liberty."[11] With the American Revolution, the King's rights became vested in the newly created American states and "the people of each state became themselves sovereign; and in that character hold the absolute right to all their navigable waters and the soils under them for their own common use, subject only to the rights since surrendered by the Constitution to the general government."[12]

This position is, of course, only a default. Such "soil below low-water mark is the subject of exclusive propriety and ownership, belonging to the State on whose maritime border, and within whose territory it lies," but such public ownership remains "subject to any lawful grants of that soil by the State, or the sovereign power which governed its territory before the declaration of independence."[13] A private party may hold such lands "by the king's charter or grant; and this is without question. The king may grant fishing within a creek of the sea, or in some known precinct that hath known bounds, though within the main sea. He may also grant that very interest itself, viz. a navigable river that is an arm of the sea, the water and soil thereof."[14] Both the default of public ownership and the possibility of private ownership were memorialized within the Virginia Code.[15]

The default of public rights had to be considered against claims of private owners to navigable rivers and their soils — an issue complicated by the long history of experimentation in the charters issued by the King for lands in North America.[16] Over time, charters and their interpretations in North America followed a "trend downward toward easy tenures … to the detriment of the king's interests."[17] More and more commonly, rights that had been held to the King were, at least in part, transferred either to private parties or to governing persons or corporations within the colonies. Such trends are significant here only in that such variation among charters and grants across nearly two centuries of colonial government means that determining the precise character of rights acquired involves specific inquiries into each individual grant.

---

[8] *See* WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND: BOOK THE SECOND 262 (5th ed. 1825) ("Yet is seams only to be reasonable, where the soil of the river is equally divided between the owners of the opposite shores: for if the whole soil is the freehold of any one man, as it must be whenever a several fishery is claimed, there it seems just (and so is the usual practice) that the eyotts or little island, arising in any part of the river, shall be the property of him who owneth the piscary and the soil.").

[9] Viola Florence Barnes, *Land Tenure in English Colonial Charters of the Seventeenth Century*, in ESSAYS IN COLONIAL HISTORY PRESENTED TO CHARLES MCLEAN ANDREWS 4 (Yale Univ. Press, 1931).

[10] *Martin*, 41 U.S. at 412.

[11] *Id.*

[12] *Id.* at 410.

[13] Smith v. Maryland, 59 U.S. 71, 74 (1855).

[14] Commonwealth v. Morgan, 303 S.E.2d 899, 902 (Va. 1983).

[15] *See* VA. CODE ANN. § 62.1-1 (1950).

[16] *See* Barnes, *supra* note 9, at 4 (stating that charters are "not by any means all alike."); *see also* CHARLES ANDREWS, THE COLONIAL PERIOD OF AMERICAN HISTORY: ENGLAND'S COMMERCIAL AND COLONIAL POLICY 4 (Yale Univ. Press, vol. 4 1938).

[17] *Id.* at 10.

The process and corollary burdens of such inquiries are of considerable concern when it comes to navigable waters and submerged lands because those cut against the default position of public ownership. As the Supreme Court observed in 1847, "[t]he dominion and property in navigable waters, and in the lands under them, being held by the king as a public trust, the grant to an individual of an exclusive fishery in any portion of it, is so much taken from the common fund."[18] Thus, the Court held that "grants of that description are therefore construed strictly — and it will not be presumed that he intended to part from any portion of the public domain, unless clear and especial words are used to denote it."[19]

Debates over the proper construction of grants that might or might not include a navigable waterway have continued for centuries now. By 1771, for example, the city of London claimed ownership of the soil of the river Thames, a claim that was later challenged by others.[20] Within the United States, following the rule of strict construction, the vast majority of cases involving private ownership of navigable waterways and their soils have found in favor of public ownership and refused to recognize the rights claimed by private parties by virtue of their King's grants.[21]

B. King's Grants in Virginia

The Virginia Supreme Court most recently addressed this issue in *Kraft v. Burr*, holding that the King could (and did) grant to private owners exclusive fishing rights in navigable rivers and, therefore, private property in the river bottoms.[22] For a particular subset of grants, often referred to as King's grants, this case had the effect of standardizing the Crown intent to privatize navigable waterways, effectively removing the burdens of proving private ownership.[23] The Virginia Supreme Court justified its opinion by finding that the U.S. Supreme Court, for its part, had recognized the rights of the states to interpret grants within their own territories, even where interpretations may remove lands from the public trust.[24] To determine whether such a right exists in Virginia landowners, the court simply looks to whether or not the predecessors in title appear to have received specifically a grant of the soil of the river.[25]

In light of the article included in this symposium issue by James Jennings and Erin Ashwell entitled "English Common Law Grants under Virginia Law: Rivers, Tides and the Taking Clause," no further history of the King's grants will be provided here.[26] For the purposes of this article, the primary point is that the King's grant in Virginia has allowed for private ownership of navigable waterways and the construction of privately owned and operated dams along those waterways.

---

[18] *Martin*, 41 U.S. at 411.
[19] *Id.*
[20] THE LONDON MAGAZINE, OR GENTLEMAN'S MONTHLY INTELLIGENCER, vol. 40 at 231–232 (1771).
[21] *See, e.g.*, Den v. Assoc. of the Jersey Co., 56 U.S. 426 (1854) (refusing to find private title in lands below the low-water mark because the soil under the public navigable river belonged to the state); *Martin*, 41 U.S. at 412 (finding that a transfer of rights in the navigable water soils were held by the private party by virtue of his powers of government of a colony rather than as a private owner and therefore vested in the state with the American Revolution).
[22] 476 S.E.2d 715 (Va. 1996).
[23] For a more extensive discussion of this history, see Larry W. George, *Public Rights in West Virginia Watercourses: A Unique Legacy of Virginia Common Lands and the Jus Publicum of the English Crown*, 101 W. VA. L. REV. 407 (1998).
[24] U.S. v. Chandler-Dunbar Water Power Co., 229 U.S. 53 (1913).
[25] Wallace v. Hoggard, 66 Va. Cir. 369, 371 (2005).
[26] *See*, James W. Jennings and Erin B. Ashwell, *English Common Law Grants under Virginia Law: Rivers, Tides, and the Takings Clause*, 5 SEA GRANT L. & POL'Y J. 29 (2013).

III. Virginia Dams

A. *Ownership*

The Commonwealth of Virginia contains 1,637 regulated dams,[27] which gives it the eighteenth most dams per state.[28] Of those dams, 632 are managed by the Department of Conservation and Recreation.[29] The remaining dams are operated by private parties. Within Virginia, a total of 1,077 dams are owned privately.[30] Some of these are owned by sophisticated operators, such as companies producing hydroelectric energy.[31] The remaining dams are owned by private parties who manage the dams primarily for another purpose, such as recreation. The Goshen Dam, for example, is owned by the Boy Scouts of America.[32]

B. *Operation and Management*

As an initial point, the operation and management of dams depends on the type of structure. Some dams are simply earth and rock-fill embankments, which are virtually watertight and simply hold water to a certain point and release excess via an overflow channel or spillway. Other dams have much more sophisticated potential — the ability to create controlled releases of water, whether the water level is high or low. For example, Dominion Power in Virginia makes such controlled releases and provides public information on them via their website.[33] In Virginia, such decisions are primarily made by the private owner of the dam, subject only to state water quality requirements.[34] Anecdotal information suggests that private owners may also make controlled releases when requested by county emergency planners on an ad hoc basis.

From a regulatory perspective, dam management in Virginia is vested in the Virginia Department of Conservation and Recreation (DCR),[35] which is primarily tasked with monitoring dam safety and floodplain management.[36] Management is a limited task in Virginia. A primary part of this task is the

---

[27] VA. SECTION AM. SOC'Y CIVIL ENG'RS, 2009 VIRGINIA INFRASTRUCTURE REPORT CARD 1 (2009), *available at* http://www.ascevirginia.org/vainfwg/2009%20Infrastructure%20Report%20Card%20Documents/Forms/AllItems.aspx.

[28] *Id.*

[29] *Id.*

[30] *Id.*

[31] *See* Va. Center for Coal and Energy Research, Va. Energy Patterns and Trends, *Location of Electric Power Generation Plants by Primary Fuel Consumed*, http://www.energy.vt.edu/vept/electric/plantlocations.asp#Hydro (last visited Jan. 9, 2013) (providing a map of all power plant locations in Virginia).

[32] *See* Rex Bowman, *Rockbridge Co. Residents Worry about Dam's Safety*, THE ROANOKE TIMES, Aug. 31, 2010, http://www.roanoke.com/news/roanoke/wb/258750 (setting forth the community's concern about Goshan Dam and providing facts). For a report on the safety and operation of this dam, see GOSHEN DAM, LAKE MERRIWEATHER, VIRGINIA, DAM SAFETY EVALUATION REPORT DECISION DOCUMENT, *available at* http://www.co.rockbridge.va.us/departments/emerg_man/Dam%20Safety%20Report1.pdf (last visited Dec 6, 2012) [hereinafter GOSHEN DAM SAFETY REPORT].

[33] *See* Dominion, *Projected Flow Releases*, https://www.dom.com/about/stations/hydro/lake-gaston/projected-flow-releases.jsp (last visited Jan. 9, 2013) (providing daily projected flow releases for Gaston Dam).

[34] *See* GOSHEN DAM SAFETY REPORT, *supra* note 32, at 1.

[35] Va. Dep't Conservation & Recreation, http://www.dcr.virginia.gov/ (last visited Jan. 9, 2013).

[36] *See* Va. Dep't Conservation & Recreation, Dam Safety, *Dam Safety, Floodplain Management*, http://www.dcr.virginia.gov/dam_safety_and_floodplains/index.shtml (last visited Jan. 9, 2013) (stating the purpose of the Dam Safety Program).

classification of dams. Dams are classified based on potential loss of human life or property damage if it were to fail. "Hazard potential classifications" descend in order from high to low, high having the greatest potential for adverse downstream impacts in event of failure.[37] The Virginia Soil and Water Conservation Board has provided a "Guidance Document on Impounding Structure Hazard Potential Classifications," which contains procedures for determining the hazard class of a dam.[38]

Regulations require that any owner of an impounding structure must obtain a Regular Operation and Maintenance Certificate every six years. Applications must contain such information as: an operating schedule including the operation of control gates, spillways and drains; a maintenance plan and schedule; an inspection schedule; inspection reports; and, in some cases, an Emergency Action Plan. An Emergency Action Plan (EAP) is required for each High and Significant Hazard Potential Dam. It is the dam structure owner's responsibility to develop, maintain, exercise and implement an EAP, which is submitted every six years.[39]

IV. Privately Owned Dams and Climate Change

A. Operation of Private Dams in Virginia

Notably, what is not a part of the Virginia DCR structure of dam regulation/management at the state level are directives related to the management of water levels and controlled releases of the dam. Those are left within the control of individual owners. Upon initial examination this might not seem to have vast implications, as surely private dam owners can be expected to strive to prevent flooding if only to minimize the possibility of their personal liabilities.

The situation is, however, much more complex. First, there are multiple goals that may be obtained through the management of water levels and controlled releases. These include, for example, flood damage reduction, navigation, power production, water quality, water supply, and recreation. Without governmental direction as to how to prioritize these various goals, private parties are likely to make their own decisions about how to pursue these varied — and often competing — goals. For example, in the operation of the Goshen Dam, the private owner has "maximized existing spillway capacity" during the winter months for aesthetic and recreational reasons, which ultimately led to "detrimental water quality downstream … due to the sediment-laden discharges that occur during the winter months."[40] With respect to water quality, there are regulations allowing the Virginia Department of Environmental Quality to direct a private owner to operate the dam differently. Such provisions do not exist systematically for other goals, such as flood damage reduction. Second, and more importantly, while an individual dam operator may attempt to minimize the likelihood of a dam contributing to flooding, or even attempt to proactively prevent flooding through lowering water levels in advance, such interventions would be, at best, ad hoc and unsystematic.

By way of contrast, consider, for example, the Tennessee Valley Authority's (TVA) complex system of river management.[41] TVA uses reservoir operating guides to provide a system for moving water through the river network.[42] The TVA also maintains a sophisticated River Forecast Center where

---

[37] 4 VA. ADMIN. CODE § 50-20-40 (2012).

[38] VA. DEP'T CONSERVATION & RECREATION, DAM SAFETY, VIRGINIA SOIL AND WATER CONSERVATION BOARD GUIDANCE DOCUMENT ON IMPOUNDING STRUCTURE HAZARD POTENTIAL CLASSIFICATIONS (Jan. 14, 2010) *available at* http://www.dcr.virginia.gov/dam_safety_and_floodplains/documents/dshazardpotentialpolicy01-14-10.pdf.

[39] 4 VA. ADMIN. CODE § 50-20-175 (2012).

[40] *See* GOSHEN DAM SAFETY REPORT, *supra* note 32, at 3.

[41] *See* Tenn. Valley Auth., *River Management*, http://www.tva.com/river/index.htm (last visited Jan. 9, 2013).

[42] Tenn. Valley Auth., *Reservoir Operating Guides*, http://www.tva.com/river/flood/opguides.htm (last visited Jan. 9, 2013).

"[r]iver schedulers continually monitor weather conditions and water quality data, as well as water availability and demand — all with the goal of routing water through the river system to provide the most public value given changing weather conditions and water needs."[43] Networked or comprehensive management of the river system allows the TVA greater control and flexibility when approaching major storm events, which are likely to increase with global climate change. Individually controlled dams in Virginia leave a significant portion of Virginia's dams (roughly three-fifths) unavailable to participate in such emergency management operations.

B. Possibilities of Public Ownership?

Given that private ownership of navigable waterways and their subaquatic soils continues to be a topic of debate and public concern in Virginia,[44] it is only natural to ask whether it is possible for the public to gain control over these waterways. In light of the Virginia Supreme Court's current position on this issue, such governmental appropriation of private dams would be a taking. Takings are acceptable for "public uses,"[45] for which flood and storm control in times of disaster would qualify.[46] However, such takings would still require compensation.[47]

In the next section, this article considers the liabilities of private dam owners both under traditional tort principles and under current Virginia regulations related to the safety and maintenance of dams, as well as the liabilities of governmental entities to consider whether it might be in the best interest of private land owners to consider a voluntary transfer to the state — or at least a voluntarily surrender of the operation of dams — allowing the state to set priorities for water management and to make a determination as to whether it would be in the state's best interest to accept such transfers.

V. Dam Operation Liabilities: Incentives to Forego Property Rights?

A. Private Dam Owners' Liabilities

An owner of a private dam in Virginia is defined as the owner of the land on which an impounding structure is situated, the holder of an easement permitting the construction of an impounding structure, or any person or entity agreeing to maintain an impounding structure.[48] According to the Virginia Dam Safety Act, "[t]he owner shall be responsible for liability for damage to the property of others or injury to persons, including, but not limited to, loss of life resulting from the operation or failure of a dam."[49]

Traditionally, a variety of common law claims have supported damages against dam owners or operators in the event of flooding. Luckily, there is not a wealth of case law available on dam failures within the United States. With that said, there are enough cases to outline the parameters of potential liabilities. First, strict liability may be available for an inherently or abnormally dangerous business operation. In *Clark-Aiken Co. v. Cromwell-Wright Co.*, a Massachusetts court permitted a strict liability

---

[43] Tenn. Valley Auth., *River Forecast Center*, http://www.tva.gov/river/flood/center.htm (last visited Jan. 9, 2013).
[44] Citizens, particularly fly fishermen, continue to challenge private ownership of navigable waterways. *See, e.g.*, Roy A. Hoagland, *Anglers learn that fishing in some VA rivers is at their own risk*, BAY JOURNAL (Sept. 2011) http://www.bayjournal.com/article/anglers_learn_that_fishing_in_some_va_rivers_is_at_their_own_risk.
[45] Kelo v. City of New London, 545 U.S. 469, 472 n.1 (2005).
[46] In considering the public use of a property, factors would include a project's economic, environmental, and social ramifications. *Id.* at 474 n.2.
[47] *Id.* at 472 n.1.
[48] *See* 4 VA. ADMIN. CODE § 50-20-30 (2012) (setting forth definitions for Impounding Structure Regulations).
[49] VA CODE ANN. §10.1-613.4 (2012).

claim in the case of dam failure where the impounding of water via a dam was determined to be an "abnormally dangerous activity." Whether any activity is "abnormally dangerous" and thus subject to strict liability is to be determined on a case-by-case basis,[50] which considers (1) the degree of risk created by the activity, (2) the gravity of the harm that may result, (3) whether the risk cannot be eliminated by the exercise of reasonable care, (4) whether the activity is not a matter of common usage, (5) whether the activity is appropriate to the place where it is carried out, and (6) the value of the activity to the community as laid out by the Restatement 2d Torts § 520. Within the Commonwealth of Virginia, there are indications that strict liability would apply, at least in the event of the failure of a dam. *Akers v. Mathieson Alkali Works*, a 1928 Virginia case, cites to Shearman & Redfield on Negligence, 6 ed., Cyclopedia of Law and Procedure (40 Cyc. 684), and Ruling Case Law (27 R.C.L. 1210) to establish strict liability in the case of dam failure.[51]

Second, if strict liability were not available, claimants could pursue an action for negligence. In order to show liability for dam failure on the basis of negligence the plaintiff must show that the alleged negligence in the construction or maintenance of the dam was the proximate cause of the plaintiff's injury. The plaintiff must meet this burden by a showing that (1) the negligence of the defendant caused the failure of the dam and (2) the failure of the dam caused the damage complained of.[52] In addition, it seems likely that a private party would be unable to delegate this duty to another who might be constructing or maintaining the dam. The Supreme Court of Appeals of Virginia held in *Bowers v. Town of Martinsville* that preservation of banks of a canal during construction of a bridge was a non-delegable duty.[53] Following this line of reasoning, a dam owner would remain liable even if a contractor or subcontractor acted negligently.

Third, trespass claims have also been found viable for water entries onto neighboring land. The Supreme Court of Virginia in *Cooper v. Horn* held that plaintiff's theory of trespass to land by the discharge of a large volume of water constructed by the defendant was properly put before a jury.[54] Notably, a showing of negligence is not a required element of the cause of action for trespass.[55]

One important consideration in these cases will be whether or not the defendant-dam owner can take advantage of the "act of God" defense. This defense may not apply when an owner has the option to control or mitigate circumstances and may not apply where human agency was a cause contributing to the flood damage.[56] Furthermore, and perhaps most importantly in light of increasing storm damage and frequency, the act of God defense may not apply if a storm is not unprecedented. Currently, Virginia requests capacity for a storm dropping 28–38 inches of precipitation within 24 hours. Additionally, recent history shows Virginia storms with 18 inches in 8 hours and 30 inches in 16 hours.

Finally, in addition to the potential for tort or statutory liability in the event of flooding, dam owners are also liable for bringing dams into compliance with state regulations, which are changing to accommodate more severe and frequent storms. Current estimated costs of bringing each private dam into compliance with regulations is at least $1.75 million, but is more likely between $4 and $6 million. The average dam is 50 years old and costs will continue to increase with age. Dam owners will be required to face these costs even without the arrival of a disastrous event.

---

[50] Clark-Aiken Co. v. Cromwell-Wright Co., 323 N.E.2d 876, 887 (Mass. 1975).
[51] Akers v. Mathieson Alkali Works, 144 S.E. 492, 495 (Va. 1928).
[52] *See* 19 AM. JUR. 2D *Proof of Facts* 75 (1979) (setting forth the burden of proof).
[53] 159 S.E. 196, 202 (Va. 1931).
[54] Cooper v. Horn, 448 S.E.2d 403, 406–07 (Va. 1994).
[55] *Id.* at 406.
[56] *Id.* at 408.

B. "Bystander" Liability of Private Dam Owners

An important distinction must be made between the potential levels of liability for the private dam owner. As noted above, traditional common law causes of action provide liability for dam failures as well as flooding resulting directly from the operation of the dam. A different question is presented by the lack of preventative actions or the mere existence or arrangement of the dam within the water system.

With that said, the most recent case on point suggests that such liability may well exist. In *Robinson v. United States*, the Fifth Circuit considered whether there could be liability for aggravating the effects of Hurricane Katrina. The Court noted that the size and configuration of the Army Corps of Engineer's interventions within the city of New Orleans had "aggravated the storm's effects on the city and its environs."[57] This approach to liability suggests that more than simply negligent activities may give rise to liability; dam owners and operators may have an affirmative duty to consider their role in the movement of water through the river system in the event of extreme weather events.

C. Governmental Liabilities

If the Commonwealth of Virginia took over operation and/or ownership of private dams, the state would not inherit the same liabilities as those of the private owner. Examining potential liabilities from design and construction of levees in the case of *In re Katrina Canal Breaches Litigation*, the Fifth Circuit found that the government, specifically the Army Corps of Engineers, could not be held responsible because of the discretionary function exception to the Federal Tort Claims Act.[58]

In *U.S. v. Gaubert*, the U.S. Supreme Court established a two-part test for determining whether a government action is a discretionary function. Discretionary functions "involve an element of judgment or choice" [59] and "government actions and decisions based on considerations of public policy."[60] Such a definition is likely to fit governmental actions balancing the various priorities of managing the flow of a watercourse such as navigation, power production, recreation, and flood and disaster control.

VI. Conclusion

The colonial legacy of unique private property rights in Virginia raises a specific set of problems for climate change. Rising sea levels and storms of increasing frequency and magnitude demand detailed planning and preparation. Private dams, particularly when operated to maximize other social goods such as recreation, prevent optimal management of river systems within the state.

In light of the possibilities of systemized river management and the significant liabilities that dam owners do and will face with climate change, this article suggests that the Commonwealth needs to determine the degree to which storm surges and flooding could be managed through systematized regulation of the river system. If enough water can be controlled through private dams that have the capacity for controlled releases, the state may wish to consider a program to allow relinquishment to these dams that have the option of controlled releases. In such a program, the state would take possession, moving management to the DCR, and assuming liability and costs of currently needed repairs. Acting with discretion, the DCR would be unlikely to have liability for dam failures and the DCR

[57] In re Katrina Canal Breaches Litigation, 696 F.3d 436, 441 (5th Cir. 2012).
[58] *Id.* at 436.
[59] United States v. Gaubert, 499 U.S. 315, 322 (1991).
[60] *Id.* at 323.

would have the opportunity to work pro-actively, using system-wide management to deal with storms and flooding.

The American Takings Revolution and Public Trust Preservation: A Tale of Two Blackstones

Blake Hudson[1]

Abstract: The U.S. Constitution was forged out of a revolution that both rejected and embraced aspects of English legal tradition. The Takings Clause and its subsequent jurisprudential interpretation represents a rejection of what the Framers at the time and constitutional Reframers since that time viewed as central government over-reaching and improper interference with private property rights. The Framers left fully intact—and a different set of constitutional Reframers are increasingly seeking to use—the English common law doctrine of public trust to prevent private property rights from trumping the public's interest in certain resources, especially in the coastal zone. This doctrine inherently conflicts with the Takings Clause in many cases, for if a resource is protected by the public trust, then any restrictions on property made pursuant to that protection cannot result in a taking—the restrained activity was never part of the property owner's bundle of property rights to begin with. This essay highlights the inevitable legal tension between the Takings Clause and public trust doctrine and its implications for coastal zone resources in a time of climate change. The article explores three implications of the Takings Clause-public trust tension: (1) resolution of future legal controversies related to climate change along the coast; (2) a potential rebalancing of modern takings jurisprudence, which has arguably disturbed the appropriate balance between private property protections and the public good; and (3) the creation of better governance structures through institutional design enhancements and adjustments—in this case focusing on the institution that is U.S. constitutional law.

> The third absolute right, inherent in every Englishman, is that of property.[2]
>
> - William Blackstone

> [T]here are some few things which, notwithstanding the general introduction and continuance of property, must still unavoidably remain in common[3] ... it follows from the very end and constitution of society, that this natural right, as well as many others belonging to man as an individual, may be restrained by positive laws enacted for reasons of state or for the supposed benefit of the community.[4]
>
> - William Blackstone

[1] Associate Professor of Law, LSU Law Center and LSU School of the Coast and Environment. For their comments and insights, I wish to thank all of the participants in the History, Property, & Climate Change in the Former Colonies Symposium at Washington & Lee University School of Law. I am further grateful to the organizers of the conference for inviting me to participate in the symposium, and in particular Jill Fraley for her efforts in making the conference a resounding success. Finally, I thank the peer-reviewers and editors of the *Sea Grant Law & Policy Journal* for reviewing and publishing this article and for their wonderful suggestions, edits, and effort. I dedicate this article to my good friend and mentor Clark Hultquist, who cultivated my love of history and who has provided a model of teaching, scholarship, and service to which I aspire.

[2] SIR WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND: IN FOUR BOOKS, Vol. 1, *137 (William Draper Lewis ed., Rees Welsh & Company 1915).

[3] SIR WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND: IN FOUR BOOKS, Vol. 2, *14 (William Draper Lewis ed., Rees Welsh & Company 1915).

[4] *Id.* at *411.

The story of the American Revolution and the creation of the United States' governance structure has been told many times and through many different lenses, both contemporary and historical. The continued retelling of this story is understandable given the remarkable form of governance established by the U.S. Constitution. The Constitution is the oldest written constitution in continuous use, and has become a model document upon which many other nations have based their own governmental structures.

The Constitution, of course, was forged out of revolution, which drove the need to place in more tangible textual form the new governance structure that would immediately be needed to ensure the success of a new nation. Yet it is useful to be reminded at the most fundamental level of why *precisely* the Framers chose to establish an entire governance structure in textual form and break from the manner in which governments had historically operated up until 1787. Ultimately, our Framers chose to place in written form the rules of governance and rights that they had been denied under English rule—rights they believed were not guaranteed under English law, thus leading to revolution. After all, England was, and remains to this day, governed by an unwritten constitution.[5] The Framers did not want our new nation to be guided entirely by unwritten rules implemented at the whim of centralized authority and dependent upon the benevolence of a monarch or the policies of a parliament that, in some respects, made up procedure and rules of governance as they went. Yet the U.S. Constitution did not fully supplant English law. Rather, the Constitution can be conceptualized as a modification of English law that at its core melded one legal tradition, English common law, with a new legal institution that we call constitutional law. While English common law dates as far back as 1066 and William the Conqueror, residing largely within and developed by the individual states, modern constitutional law looks to text established at the genesis of our government for answers to the most fundamental legal questions. This melding demonstrates that our chosen form of governance in the U.S. ultimately maintained the parts of English law that we preferred within state common law, while rejecting through constitutional text those parts that we did not prefer.

Perhaps nothing illustrates the implications of this schizophrenic homage to English legal tradition as well as the inevitable collision of the Takings Clause of the Fifth Amendment of the U.S. Constitution and the common law public trust doctrine—a collision that has direct implications for coastal zone resource management in the face of climate change. These two principles of modern American law may be said to represent polar propositions put forth by the renowned English jurist and legal philosopher William Blackstone. Blackstone has been credited with providing the most thorough accounting of English law through the mid-18th Century. Indeed, by some accounts the impact of Blackstone on legal theory in the 19th century was "greater in the United States than in Blackstone's native land. After the American Revolutionary War [Blackstone's] Commentaries was the chief source of the knowledge of English law in the American republic. A work that was a textbook in the old country became in the new one an oracle of law."[6]

The Takings Clause to some, and as interpreted by many courts today, represents a principle of Blackstonian philosophy often cited by property rights advocates that property rights are inherent, inalienable rights crucial to the success of a free society,[7] and as a result should be as free as possible from government intrusion. Indeed, though some form of due process had been guaranteed to English property owners since the Magna Carta, the Takings Clause owes its very existence to, at the very least,

---

[5] *See generally*, Jane Ball, *The Boundaries of Property Rights in English Law*: *Report to the XVIIth International Congress of Comparative Law*, 10.3 ELECTRONIC JOURNAL OF COMPARATIVE LAW (2006), *available at* http://www.ejcl.org/103/abs103-1.html.

[6] Encyclopedia Britannica, Sir William Blackstone, http://www.britannica.com/EBchecked/topic/68589/Sir-William-Blackstone/729/Assessment (last visited Jan. 15, 2013).

[7] BLACKSTONE COMMENTARIES, *supra* note 2.

a partial rejection of English property law. The Takings Clause "provided greater protection for the property owner than the property owner had traditionally received,"[8] since the Magna Carta was intended to provide compensation only when *personal* property was taken by the government. Physical governmental appropriation of private land, on the other hand, did not require compensation. The English crown was only prohibited from "tak[ing] anyone's grain or other chattels, without immediately paying the money."[9] In contrast, "the sole limitation on government seizure of land was one of procedural regularity,"[10] with the Magna Carta declaring that "[n]o free man shall be dispossessed … *except by the legal judgement of his peers or by the law of the land*."[11] The colonies operated under a similar application of English law, only compensating for the dispossession of personal property by the government, and "[n]o colonial charter required compensation for the seizure of land," even when colonial governments built roads on undeveloped, private lands.[12]

Thus the Takings Clause may be viewed as a codification of Jeffersonian notions of property[13]—at least in the mind of the Framer primarily responsible for its inclusion in the Constitution, James Madison[14]—contemplating that a stable, free, and truly democratic society would be best crafted from the participatory decision-making of a landed populous, where citizens maintained protected rights to property as free as possible from direct interference or abuses of centralized authority.[15] Madison and other Framers were obviously concerned with abuses that had occurred under English occupation. For example,

> In drafting the [Takings Clause], it appears that Madison sought to address very particular concerns. One type of government action during the revolutionary era that troubled him was the seizure of loyalist land. Such seizure had occurred on a scale of epic proportions: Loyalist property worth more than twenty million dollars—one tenth the value of real property in the country—was confiscated.[16]

[8] William Michael Treanor, *The Original Understanding of the Takings Clause*, Georgetown Environmental Law & Policy Institutes Papers & Reports, 5 (1998), *available at* http://scholarship.law.georgetown.edu/gelpi_papers/2/.
[9] Magna Carta, Art. 28.
[10] Treanor, *supra* note 8, at 5.
[11] Magna Carta, Art. 39 (emphasis added).
[12] Treanor, *supra* note 8, at 5.
[13] *See* Luigi Marco Bassani, *Life, Liberty, and … : Jefferson on Property Rights*, 18 J. OF LIBERTARIAN STUDIES 31, 79-81 (2004), *available at* http://mises.org/journals/jls/18_1/18_1_2.pdf (noting that "Jefferson did not reject the natural right of property in favor of a higher form of democracy, but rather derived his higher form of democracy from the right of property," and that "the true meaning of the 'pursuit of happiness' in Jeffersonian doctrine" means that "the right to have a government that does not infringe on one's own natural rights, in particular on property rights," and quoting Jefferson: "the true foundation of republican government is the equal right of every citizen, in his person and property, and in their management.")
[14] Treanor, *supra* note 8, at 2.
[15] The Takings Clause "was probably intended to restrain the arbitrary and oppressive mode of obtaining supplies for the army, and other public uses, by impressment, as was too frequently practiced during the revolutionary war." *Id.* at 4-5.
[16] *Id.* at 5.

A review of the rights the English crown historically maintained, and parliament maintains today, on private property in Britain bears out a contrast to the American property ideal.[17] Thus, the U.S. Constitution placed explicit and more stringent limits on the government than existed in England and that we still adhere to today (though in varying degrees depending on the constitutional interpreter). Property can be appropriated or regulated by the government, but *only* for public use and after compensation is awarded to the property owner for their loss of property or loss of use of property.

Modern debates over the meaning and scope of the Takings Clause occur somewhere between two extremes—those who argue that the Framers intended compensation to be owed for virtually *any* limitation on private property (*i.e.*, any regulations)[18] and those who believe the Framers only intended the clause to apply to physical appropriation of property by the government (*i.e.*, eminent domain).[19] Either way, however, it seems clear that the Framers intended more stringent protections than those existing in England, making more concrete the notion that property is the absolute and inherent right of every American, to paraphrase Blackstone.

Even though the Framers rejected an aspect of English legal tradition by etching in stone Takings Clause protections, they left fully intact English common law principles of public trust, which has historically applied to resources like the coastal zone, submerged lake beds, and wildlife.[20] Though the public trust doctrine had been implicitly discussed in earlier cases,[21] the genesis of the doctrine in the United States has long been considered the case of *Illinois Central Railroad vs. Illinois*.[22] In *Illinois Central*, the U.S. Supreme Court held that the state of Illinois could not divest the submerged lake bed under Lake Michigan to a private enterprise without considering whether such a divestment properly accounted for the interests of the public, who in fact held title to the property. The Court went to great lengths to trace the origins of the doctrine back to England (and even further to Roman times), detailing that the rights of the public tracked the historic rights of the English Crown regarding navigable waters and land submerged underneath them.

Just four years after *Illinois Central* the Court undertook a similar historical analysis in the case of *Geer v. Connecticut*,[23] where it upheld the authority of the state to establish laws regulating the taking of wildlife. The Court's analysis hinged on the finding that the rights of the public inhered in the state's wildlife just as the Crown in England maintained ultimate control over wildlife. As scholars have noted, "the essential core of English wildlife law on the eve of the American Revolution was the complete

---

[17] MICHAEL BEAN AND MELANIE ROWLAND, THE EVOLUTION OF NATIONAL WILDLIFE LAW 7-10 (3d ed. 1997). For an example of the fluid nature of English property rights and the ability of the government to change and adapt them over time, *see* CHRISTOPHER RODGERS, PROPERTY RIGHTS, LAND USE AND THE RURAL ENVIRONMENT: A CASE FOR REFORM, LAND USE POLICY 26S S134–S141 (2009), *available at* http://www.bis.gov.uk/assets/foresight/docs/land-use/jlup/16_property_rights_land_use_and_the_rural_environment_-_a_case_for_reform.pdf.

[18] *See, e.g.*, RICHARD EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN (1985) (arguing that any net diminution in the value of property requires compensation).

[19] *See* Treanor, *supra* note 8.

[20] *See* Blake Hudson, *The Public and Wildlife Trust Doctrines and the Untold Story of the Lucas Remand*, 34 COLUM. J. ENVTL. L. 99 (2009).

[21] *See, i.e.,* Martin v. Waddell's Lessee, 41 U.S. 367 (1842). In *Martin*, the Court found it unjustifiable for "the shores, and rivers and bays and arms of the sea, and the land under them, instead of being held as a public trust for the benefit of the whole community … had been converted by the charter itself into private property, to be parcelled out and sold by the duke, for his own individual emolument[.]" *Id.* at 413. One author has noted that the Court in *Martin* found that "the public trust character of navigable waters and their submerged lands survived a grant by the King of his proprietary interest in them … the question was whether it also survived the American Revolution. [The Court] declared that it did." BEAN, *supra* note 17, at 11.

[22] 146 U.S. 387 (1892).

[23] 161 U.S. 519, 528–29 (1896).

authority of the King and Parliament to determine what rights others might have with respect to the taking of wildlife"—largely with little regard to what citizen property rights may be infringed.[24] The U.S. Supreme Court has described the transition of this power to the states, noting that when state citizens "took possession of the reins of government, and took into their own hands the powers of sovereignty, the prerogatives and regalities which before belonged either to the crown or the parliament, became immediately and rightfully vested in the state,"[25] and that,

> Undoubtedly, this attribute of government to control the taking of animals *ferae naturae*, which was thus recognized and enforced by the common law of England, was vested in the colonial governments. ... It is also certain that the power which the colonies thus possessed passed to the states with the separation from the mother country, and remains in them at the present day.[26]

Scholars have further described the authority that this trust gave the English Crown and U.S. state governments as follows,

> English laws, which gave the Crown complete authority to determine the rights of landowners with respect to wildlife management, also became part of the common law of the colonies and eventually that of the several states which assumed the Crown's responsibility to act 'as trustee to support the title [to wildlife] for the common use.'[27]

Indeed, the English Crown could go to great lengths to restrain private property rights when exercising the public trust. Take, for example, the use of the "Forest Jurisdiction"—which was an early system of forest laws administered by special courts and officials. In these jurisdictions, "all forest land 'was subject to an easement for the benefit of wildlife' that allowed forest officials to enter private land and remove vegetation needed for wildlife."[28] The origin of the Forest Jurisdiction in England was quite dramatic, beginning when "William the Conqueror laid waste thirty-six Towns in Hampshire to make a Forest."[29] Today, in a time when urban sprawl places forests, coastal wetlands, and the climate regulation services they provide under increasing stress, it is hard to conceptualize a policy mandating that forest or wetland "sprawl" replace human development. Yet this extreme form of land use regulation exercised by the English Crown was the origin of public trust protections that now reside in state common law and which have been expanded over time to protect a variety of resources other than submerged lakebeds under navigable waters and wildlife. Indeed, the continuing expansion of public trust protections in the U.S. represents a second line of Blackstonian philosophy that private rights may be restrained by positive law enacted for the benefit of the community.[30]

The fundamental paradox presented by the Framers' implicit retention of the public trust doctrine within state common law (through the 10th Amendment) and their revolutionary textual codification of the Takings Clause, is that if the public trust doctrine is found to legitimately apply, it renders the Takings Clause meaningless, at least in some ill-defined and unclear set of circumstances that continue

---

[24] BEAN, *supra* note 17, at 10.
[25] *Martin*, 41 U.S. at 416.
[26] *Geer*, 161 U.S. at 527–28.
[27] Hope M. Babcock, *Should Lucas* v. *South Carolina Coastal Council Protect Where the Wild Things Are? Of Beavers, Bob-O-Links, and Other Things That Go Bump in the Night*, 85 IOWA L. REV. 849, 880-81 (2000).
[28] BEAN, *supra* note 17, at 9.
[29] *Id.*
[30] BLACKSTONE COMMENTARIES, *supra* note 3, at *411.

to expand in scope. The entire premise of the public trust doctrine is that the public's rights inhered in certain resources or property *prior* to any private property rights that may later be granted or claimed by owners with otherwise legal title to that property. In other words, the rights of the public operate much like a restrictive covenant embedded within an individual's title. Thus if the public trust inhered in one's property—presumably pursuant to the crown's authority during the time of British rule—and continued through colonial governance, state governance under the Articles of Confederation, and federal and state governance under the U.S. Constitution, then any governmental restrictions later placed on that property and aimed at those trust resources could take nothing for which compensation is owed.

Once the public trust doctrine expanded beyond submerged lands under navigable waters[31] to reach wildlife and its habitat,[32] non-navigable tributaries feeding a navigable body containing important species habitat,[33] backfilled wetlands submerged by rising seas,[34] or dry sand beach dredged by the state and adjacent to private properties,[35] it became unclear where the limits on public trust application begin and valid application of the Takings Clause ends (and indeed perhaps it never begins). As stated by Professor Lazarus, the public trust doctrine has "emerged from the watery depths [of navigable waterways] to embrace the dry sand area of a beach, rural parklands, a historic battlefield, wildlife, archaeological remains, and even a downtown area."[36] Once the public trust inhered in these resources, then the Takings Clause was rendered moot. The stick that constitutes these resources was not in the bundle of sticks purchased by the property owner, so to speak, and so a property owner cannot claim title to them, and in fact never could. Thus, nothing would be taken from them for which the government would be required to justly compensate.

Perhaps the clearest example of the Takings Clause-public trust paradox is the case of *Lucas v. South Carolina Coastal Council*.[37] *Lucas* provides a number of insights about the history of the public trust doctrine and Takings Clause, and their modern application to the coast in a time of climate change. David Lucas, plaintiff in the case, argued for an operation of the Takings Clause that, at least anecdotally, represents the "property as absolute right" Blackstone. Lucas, when faced with prohibitions on the development of his beachfront lots due to regulatory efforts by the state of South Carolina to battle eroding shorelines, stated the following:

> There are enemies of the Constitution here right now. There are core values in there that if you get away from you don't have a constitution. And one of them is the protection of private property. That's what America was founded on. An individual person can own, and what he owns is his. And that is under attack … [I] had one year from the inception of this legislation to apply for a building permit. I looked at those laws and regulations and I said "this isn't fair," why do I have to do something on their time schedule instead of mine? It's my property. I bought it. I

[31] Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387 (1892).

[32] Geer v. Connecticut, 161 U.S. 519 (1896); Barrett v. State, 116 N.E. 99 (N.Y. 1917); Miller v. Schoene, 276 U.S. 272 (1928); State v. Sour Mountain Realty, Inc., 714 N.Y.S.2d 78 (App. Div. 2000); Sierra Club v. Dep't of Forestry and Fire Protection, 26 Cal.Rptr. 2d 338 (Dist. Ct. App. 1993) (ordered not published); National Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983); Lassen v. Ariz. ex rel. Ariz. Highway Dep't, 385 U.S. 458 (1967); Pullen v. Ulmer, 923 P.2d 54 (Alaska 1996).

[33] National Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983) (holding that public trust doctrine prevented Los Angeles from draining non-tidal streams which fed a lake upon which wildlife depended).

[34] McQueen v. S.C. Coastal Council, 580 S.E.2d 116 (2003).

[35] Stop the Beach Renourishment, Inc. v. Fl. Dep't Envtl. Prot., 130 S. Ct. 2592 (2010).

[36] State v. Sorensen, 436 N.W.2d 358, 362 (Iowa 1989) (citing Richard Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning The Public Trust Doctrine*, 71 IOWA L. REV. 631, 632–33 (1986)).

[37] 505 U.S. 1003 (1992).

> paid almost $500,000 a piece for these [lots] … My goals were to stop government from encroaching on individual liberty … This was just restricting the American dream … The individual should not have to sacrifice for the good of the public.[38]

The statute at issue in *Lucas*, on the other hand, represents the Blackstonian principle of restricting private property owner activities by the passage of "positive laws enacted for reasons of state or for the supposed benefit of the community." The Beachfront Management Act (BMA) was aimed at protecting the South Carolina coast and a variety of resource values it provided: storm barrier protection, tourism generation, habitat for threatened and endangered species, and protection of vegetation crucial to the survival of the shoreline ecosystem.[39] The legislature found that these resource values were increasingly threatened by beachfront development, which had contributed to significant erosion of coastal lands.[40] Each of these resources has at some time or another and in one jurisdiction or another been subject to public trust protections, notwithstanding takings claims brought by parties like David Lucas.

Though the *Lucas* case, for reasons discussed below, ultimately elevated "absolute right" Blackstone over "benefit of the community" Blackstone, the case has come to be understood as opening the door wide for public trust application to overcome takings claims. In *Lucas*, the U.S. Supreme Court, through the very medium of its takings jurisprudence, provided a mechanism for the public trust doctrine to eviscerate regulatory takings based upon the total economic deprivation rule (a rule that the Court has argued makes a regulation the virtual equivalent to a physical appropriation of property by the government). The Court held that regulations reducing all of the economic value of property were categorically takings, *unless* background principles of the state's law of property inhered in the title. These background principles would include, for example, limitations that nuisance law might have already placed upon the property. In fact, the *Lucas* case has had an "unlikely legacy,"[41] since a number of "background principles" of property law have since been utilized to completely skirt Takings Clause protections, including the natural use doctrine; the navigational servitude; customary rights (like native gathering rights); water rights; Indian treaty rights; certain statutes, regulations, and constitutional provisions; and, of course, the public and wildlife trust doctrines.[42] Thus, "[i]nstead of increasing the likelihood of either land-owner compensation or deregulation, *Lucas's* principal legacy lies in affording government defendants numerous effective categorical defenses with which to defeat takings claims."[43] As noted by Professor Babcock,

> the Court's reliance on common law principles to craft an exception to its per se compensation rule misapprehended the continued robustness of old maxims, such as those restricting the

[38] DVD: Lucas v. South Carolina Coastal Council, Duke University School of Law, Distinctive Aspects of American Law (Duke Law 2005), *available at* http://web.law.duke.edu/voices/lucas.
[39] *See* S.C. CODE ANN. §§ 48-39-20 (Legislative Declaration of Findings).
[40] *Id.*; *see also Lucas*, 505 U.S. at 1022 n.10.
[41] Michael C. Blumm & Lucas Ritchie, *Lucas's Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 354–61 (2005). The authors further assert that "Adding to the unanticipated consequences of the Lucas opinion was the fact that the categorical takings rule concerning economic wipeouts it established turned out to apply only to a very narrow class of takings cases, while the categorical defenses authorized by the decision are quite expansive in scope. In effect, the *Lucas* decision fundamentally revised all takings analysis by making the nature of the landowner's property rights a threshold issue in every takings case." *Id.* at 322.
[42] *Id.* at 341-60.
[43] *Id.* at 321.

> uses to which private property can be put when they threaten wildlife, and thus potentially created an exception much wider than intended.[44]

Notwithstanding cases after *Lucas*, the *Lucas* case itself is largely a missed opportunity in the context of the Takings Clause-public trust doctrine debate. The story of the *Lucas* case often ends with the Supreme Court ruling. The charge given by the U.S. Supreme Court to the state on remand to the South Carolina Supreme Court was to formulate arguments as to whether there were any background principles of nuisance or property law that applied and that could avoid takings liability.[45] The only documentation that arose out of the remand was an order on remand declaring that there were no such background principles. Yet the *Lucas* story provides a far more instructive and rich lesson than the documentation would suggest.

This lesson comes alive when one listens to the oral arguments made on remand, which were neither transcribed nor documented in any fashion.[46] During oral argument, the South Carolina Supreme Court noted that proving that a background principle of nuisance law could overcome the takings claim would be a difficult if not impossible task for the state[47]—how would David Lucas building a beach home on his property be a nuisance to neighbors who also maintained beach homes? Yet, notwithstanding the difficulty of proving nuisance, the state of South Carolina missed an opportunity to argue one of the many other background principles of property law noted above, and in particular the public trust doctrine. Beyond the fact that the state utterly failed to understand what the U.S. Supreme Court required it to prove on remand, even when invited by the South Carolina Supreme Court to argue the public trust doctrine as a background principle of property law that might overcome the takings claim, the state failed to do so.[48] Remarkably, Justice Toal *invited* the Council to argue application of the public trust doctrine to the BMA:

> Would you propose to justify [the BMA] on the basis of some common law doctrine of … noxious use *or on some public trust doctrine*? … [T]he Supreme Court forbids you to justify the regulation on the basis of the '88 Beach Management Act. They say if you are going to completely prohibit use under that Act, then you have "taken," certainly for that period of time … [T]hey leave open the question of whether you could justify that regulatory taking on some common law basis, *which presumably would include public trust*.[49]

Even so, the State of South Carolina was unprepared to make a public trust argument that would expand public trust protection to these resources. About ten years after *Lucas*, the state upheld the public trust doctrine as a means of protecting a more traditional public trust resource than upland

---

[44] Babcock, *supra* note 27, at 855.

[45] *Lucas*, 505 U.S. at 1031.

[46] *See* Hudson, *supra* note 20.

[47] The South Carolina Supreme Court noted that there were "fine homes built on both sides of … these two lots. There is no way in the world you are going to be able to establish that … a nuisance is going to be created there by building a home…" Audio tape: Oral argument before the South Carolina Supreme Court on remand from the Supreme Court's decision in Lucas v. S.C. Coastal Council (Nov. 18, 1992) (on file with South Carolina Supreme Court Library).

[48] Hudson, *supra* note 20, at 130-36; Audio tape: Oral argument before the South Carolina Supreme Court on remand from the Supreme Court's decision in Lucas v. S.C. Coastal Council (Nov. 18, 1992) (on file with South Carolina Supreme Court Library).

[49] Audio tape: Oral argument before the South Carolina Supreme Court on remand from the Supreme Court's decision in Lucas v. S.C. Coastal Council (Nov. 18, 1992) (on file with South Carolina Supreme Court Library) (emphasis added).

coastal resources—that is, navigable waters and tidal lands. In *McQueen v. S.C. Coastal Council*,[50] a landowner claimed that he was deprived of all economically beneficial use of his property by regulations that forbid him from backfilling wetlands to regain property lost to rising tides. McQueen's takings claim was denied by the court, which noted the longstanding South Carolina common law tradition of applying public trust principles to navigable waters and tidal lands.

> South Carolina has a long line of cases regarding the public trust doctrine in the context of land bordering navigable waters. Historically, the State holds presumptive title to land below the high water mark. As stated by this Court in 1884, not only does the State hold title to this land in jus privatum, it holds it in jus publicum, in trust for the benefit of all the citizens of this State.[51]

Despite the fact that *McQueen* dealt with more traditional public trust resources, those linked to navigable waters, *Lucas* does appear to be an important missed opportunity to refine understandings of the intersection of the public trust doctrine and Takings Clause along the coast, especially since another South Carolina Supreme Court case, decided over four years prior to *Lucas*, applied the public trust doctrine to protect upland streams and marshland from impoundment by the South Carolina Coastal Council.[52]

Ultimately, the historical drivers of tension between the public trust doctrine and Takings Clause along the coast in a time of climate change provides an opportunity to explore three important implications of U.S. jurisprudence and constitutional law in these two areas. The first implication regards the fact-specific inquiries that will arise as legal disputes stem from climate-induced changes in the coastal zone. None of the examples outlined here are particularly novel, as scholars have highlighted the interplay between the Takings Clause and public trust doctrine for most (if not all) of them in the literature.[53] Nonetheless, when it comes to climate change impacts on the coast there are "easy" cases and there are "hard" cases. Here, the descriptors "easy" and "hard" are used to simply signify that there are areas that have been jurisprudentially explored and developed fairly well and those that have not, though these areas differ by state of course. For example, cases like *McQueen* provide guidance for resolving the balance between the public trust doctrine and Takings Clause in cases where private property owners seek to backfill land that has become submerged due to sea level rise. *Stop the Beach Renourishment* does the same for disputes over who owns dry sand beach when the government undertakes beach renourishment or restoration projects.[54] *Medlock* indicates that some states consider the public trust doctrine to apply to upland marshes connected to navigable streams and rivers, which could avoid takings claims for the regulatory preservation of such resources.[55]

---

[50] 580 S.E.2d 116 (2003).
[51] *Id.* at 119 (internal citations omitted).
[52] State ex rel. Medlock v. S.C. Coastal Council, 346 S.E.2d 716 (1986).
[53] *See, e.g.*, Margaret E. Peloso & Margaret R. Caldwell, *Dynamic Property Rights: The Public Trust Doctrine and Takings in a Changing Climate*, 30 STAN. ENV. L.J. 51 (2011); Michael Hiatt, *Come Hell or High Water: Reexamining the Takings Clause in a Climate Changed Future*, 18 DUKE ENVTL. L. & POL'Y F. 371 (2008); James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, 57 MD. L. REV. 1279 (1998); Niki L. Pace, *Wetlands or Seawalls? Adapting Shoreline Regulations to Sea Level Rise and Wetland Preservation in the Gulf of Mexico*, 26 J. LAND USE & ENVTL. L. 327 (2011); Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 ECOLOGY L.Q. 533 (2007).
[54] Stop the Beach Renourishment, Inc. v. Fl. Dep't Envtl. Prot., 130 S. Ct. 2592 (2010).
[55] State ex rel. Medlock v. S.C. Coastal Council, 346 S.E.2d 716 (1986).

On the other hand, the outer bounds of the public trust doctrine's scope and its ability to overcome takings claims in the context of climate change and the coast are woefully underdeveloped jurisprudentially. Will the public trust doctrine expand to overcome takings claims for the protection of upland resources like wetlands that act as preventative coastal land loss mitigation or adaptation measures (buffer zones for storm surge) notwithstanding questions of navigability?[56] In addition to *Medlock*, the U.S. Supreme Court, in *Phillips Petroleum Co. v. Mississippi*,[57] considered whether the state of Mississippi could invoke the public trust doctrine to protect *non-navigable* tidelands. The Court noted the long line of cases upholding "State[ ] dominion over lands beneath tidal waters."[58] The Court concluded that "our cases firmly establish that the States, upon entering the Union, were given ownership over all lands beneath waters subject to the tide's influence."[59] Yet state courts may expand the doctrine beyond lands covered by the tides or that are navigable-in-fact, as California did in protecting non-navigable tributaries feeding a navigable body containing important species habitat in *National Audubon Soc'y v. Superior Court*.[60]

As Hurricanes Isaac and Sandy recently demonstrated, storm surge disasters will become more frequent with sea level rise and increased hurricane activity. As a result, protection of non-traditional landscapes will be needed to adapt to climate change impacts in an optimal manner. Also consider wetland restoration programs like those recently put forth in the state of Louisiana's *Comprehensive Master Plan for a Sustainable Coast* (Master Plan), which plans to invest $50 billion over upcoming decades to restore the Louisiana coast and mitigate coastal land loss by fighting the encroaching sea.[61] The plan seeks the cooperation of private property owners to put such projects into place,[62] but it remains to be seen whether states will be able to prescribe more stringent requirements on property owners to achieve coastal land loss mitigation goals without takings limitations in the event that landowners do not voluntarily cooperate. The same might be said for sediment diversions, levee removal projects that may flood properties to build up land and avoid subsidence, levee construction projects that send water to neighboring properties, or other similar land building and coastal armoring projects.[63] Even government choices *not* to protect certain lands from sea level rise in favor of others or *not* to re-establish public and private access to "marooned" property could conceptually lead to takings claims.[64] What about outright prohibitions on development in particularly vulnerable areas? Can governments undertake these measures and be free of takings claims? Each of these questions needs to be explored and developed in the case law in order to provide governments in coastal areas the tools needed to adequately protect human and natural capital as sea levels rise and other climate change impacts become more severe.

The second implication is that the future manifestation of the Takings Clause-public trust tension along the coast provides an opportunity to further understand the original intent of the Takings Clause in balancing public and private interests, such as those the public trust doctrine was intended to preserve. Perhaps nowhere will we see such a clash between these interests over such a short time scale,

---

[56] *See* Blake Hudson, *Coastal Land Loss and the Mitigation-Adaptation Dilemma: Between Scylla and Charybdis*, 73 LA. L. REV. 31 (2012).
[57] 484 U.S. 469 (1988).
[58] *Id.* at 474.
[59] *Id.* at 484.
[60] 658 P.2d 709 (Cal. 1983).
[61] LA COASTAL PROT. & RESTORATION AUTH., LOUISIANA'S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST 24 (2012), *available at* http://www.coastalmasterplan.la.gov/.
[62] *Id.* at 167.
[63] For a discussion of these and other potential takings issues in the coastal zone, *see* J. Peter Byrne, *The Cathedral Engulfed: Sea-Level Rise, Property Rights, and Time*, 73 LA. L. REV. 69 (2012).
[64] *Id.*

both on the ground and in the courtroom, as along the coast in the face of rising seas. The ways in which the above-described conflicts play out will provide a potential opportunity to understand the Takings Clause in a way more consistent with historical precedent. Some scholars have argued that the Takings Clause was intended to focus on the physical taking of property rather than on regulations (the latter being Blackstone's "positive laws enacted for reasons of state or for the supposed benefit of the community"[65]). Indeed, regulatory takings jurisprudence has become quite a morass, creating a high degree of regulatory and property rights uncertainty given its ad hoc approach to resolving takings questions. Professor Treanor has argued that regulatory takings are inappropriate as a matter of historical record, indicating that Framer conceptions of the Takings Clause might actually align quite well with the purpose of the public trust doctrine at common law. So, an opportunity to explore these arguments might provide a window to reconciling the American takings revolution with the public trust preservation.

Treanor argues that the Framers' belief in democratic self-governance was the driver of the Takings Clause, and that the Framers considered that, "given the proper institutional framework, the people of this country could govern themselves wisely and well."[66] Treanor argues that the Takings Clause was drafted narrowly, contrary to its broad understanding today, "not because the founding fathers cared too little about property rights, but because they cared so much about representative democracy," and that the Framers "did not bring regulations within the ambit of the Takings Clause because they believed it was the appropriate responsibility of democratic decision-makers to balance individual property interests against other community interests."[67] Given the Framers' foundation in a republican world view, which "contends that the essential role of the state is to promote individual virtue and commitment to the common good," the Framers "treasured the institution of private property," but "[b]ecause property was valued as a means, rather than as the end of the state, however, republicans believed that legislators could limit property interests in order to advance the common good."[68] Ultimately, Treanor provides a compelling argument that:

> It is thus wrong to read the Takings Clause as embodying a fundamental rejection of majoritarian decision-making or republicanism. Its adoption reflected, instead, a congruence of concerns relating to the perceived need to protect particular forms of real property from state seizure. While it is true, as proponents of a broad reading of the Takings Clause often point out, that some of the actions of revolutionary era state governments—such as their confiscation of loyalist land—caused many of the founders to fear what unconstrained majorities, in the absence of appropriate checks and balances, might do, the founders were also worried about what wealthy property-owners might do if they were not controlled.[69]

The public trust doctrine may very well be the legal tool that can rebalance a modern Takings jurisprudence that has arguably unbalanced private property protections and the public good. Perhaps we cannot undo the regulatory takings morass, but the public trust doctrine as a categorical defense to takings claims brought against regulations aimed at protecting the wider public from climate change impacts might be able to achieve the same goal. This would provide a way to work within the current and seemingly flawed regulatory takings framework in order to draw closer to both Framer conceptions of the Takings Clause and what is needed to effectively combat climate change impacts along the coast.

---

[65] BLACKSTONE COMMENTARIES, *supra* note 2, at * 410.
[66] Treanor, *supra* note 7, at 7.
[67] *Id.*
[68] *Id.*
[69] *Id.* at 8.

The third and final implication is that the historical and precedential drivers of the Takings Clause-public trust doctrine tension raise some important, broader reaching questions of institutional and constitutional design. Either the Framers did not consider the implications of preserving within state law a common law doctrine like public trust that could render meaningless a constitutional provision like the Takings Clause, or perhaps Professor Treanor's arguments are correct and they did consider the possibility, but concluded no tension would result because the Takings Clause would not apply to government regulations. Either way, beyond the Takings Clause-public trust case study, the identification and study of other examples of our melding of English common law and American constitutional law in potentially inapposite ways is crucial to understanding not only the resolution of the legal conflicts we see today, but also how to make congruous presently incongruous principles from distinct and important bodies of U.S. law. While some might consider the historical currents to be too deep for such study to be fruitful, in a free society institutions are what we make them, and ultimately may be freed from the flow of historical currents. Recognizing institutional flaws such as the adoption of seemingly irreconcilable principles of law within one constitutional system is the first step to understanding what must be done to remedy the institutional mishap. Given that the political climate changes almost as rapidly as the actual climate over longer time scales, to lose hope in the development or adoption of new approaches to takings or public trust jurisprudence—or perhaps even overall constitutional structure—would be a mistake.

Ultimately, the takings revolution and public trust preservation in America will lead to increased legal conflicts in the coming decades as climate change affects the U.S. coastal zone, as well as inland areas. As a result, the many implications of the intersection between the Takings Clause and public trust doctrine need to be further explored if we are to develop the most robust responses to a climate-changed coast. Because if the government and its citizens are not able to "take" these properties through historical property doctrines like the public trust doctrine, then the sea may very well do so.