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VIRGINIA CASE STUDY

Stemming the Tide: How Local Governments Can Manage Rising Flood Risks

By Andrew C. Silton*and Jessica Grannis**

Georgetown Climate Center gratefully acknowledges the support of our adaptation funders who make this work possible: Rockefeller Foundation and Kresge Foundation.

Abstract: Virginia is anticipated to experience between 2.3 to 5.2 feet of sea-level rise by the end of this century. This will dramatically increase flooding and erosion along the coast, which will in turn damage property and infrastructure, destroy wetlands and beaches, and require expensive emergency response. This case study analyzes the authority of Virginia local governments to use existing land-use powers to adapt to these impacts. Specifically, this study looks at local authority to implement policy options identified in Virginia's Climate Action Plan.

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Georgetown Climate Center

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Table of Contents

Virginia Case Study

Stemming the Tide: How Local Governments Can Manage Rising Flood Risks

EXECUTIVE SUMMARY

1. Virginia's Flooding Problem

Coastal flooding in Virginia is increasing and will continue to do so over the coming decades. It is projected that sea levels will rise 2.3 to 5.2 feet along Virginia's coasts by 2100. This rate exceeds the national average because coastal land in Virginia is subsiding; it is anticipated that coastal lands will sink between 5 and 7.5 inches over the same period. As a result, Virginia will experience more destructive coastal erosion and flooding in the future, both in terms of magnitude and geographic scope.

Rising sea levels will put many more Virginians' homes and businesses at risk. Flooding may cause property damage, and owners may find their property uninsurable. More flooding will require Virginia's localities to pay for expensive emergency response and to replace damaged public infrastructure. Ultimately, the rising threat of floods could cause significant economic hardship for many in Virginia.

2. Local Governments Can Act Now To Manage These Risks

Local governments can act now to manage these risks. Structurally, local governments could allow coastal armoring. Sea walls are, however, costly to build, and they will erode beaches and wetlands that serve as natural flood buffers. Virginia's local governments can also use non-structural measures, such as regulating land use, to adapt to sea-level rise. Existing land-use laws can be used to ensure that development does not occur in highly vulnerable areas; or where development does occur, what is built is less likely to be damaged. To do so, local governments will need to change their current methods of regulating development in coastal areas.

This study examines ways in which Virginia Local governments can use existing powers to implement non-structural adaptive measures. Local governments could:

1) Consider future sea-level rise when regulating land use through planning and zoning.

2) Change their methods of regulating floodplains.

3) Use a number of specific land-use tools to adapt to sea-level rise, such as setbacks, transfer development rights, tax incentives and "rolling" open space easements.

3. Legal Authority to Consider Sea-Level Rise

a. Planning and Zoning

The Dillon Rule requires Virginia courts to narrowly interpret delegations of powers to local governments. Local governments can only take action where they have been delegated authority to do so by the state legislature. However, the Dillon Rule should *not* present a major obstacle to local implementation of adaptive measures.

The Virginia General Assembly has delegated broad powers to local governments to regulate land use through comprehensive plans and zoning ordinances. Through *comprehensive plans,* local governments

can guide future community development. *Zoning ordinances* legally implement the plan. Using zoning ordinances, local governments can divide the community into districts (or zones) and, within each district, impose a different set of regulations on how land may be developed and used.

When planning and zoning, the Virginia Code specifically directs local governments to consider many factors relevant to sea-level rise. Local governments are directed to consider: the future needs of the community, safety of people and property, the preservation of natural resources, and the preservation of property values, among other things. Accounting for sea-level rise is consistent with these directives. By doing so, localities will be ensuring that the community develops in manner to lessen or avoid potential risks to people and property from increased flooding, erosion and storm surge.

b. Regulating Flood Plains

The Virginia Code specifically authorizes local governments to consider flood hazards. Under the statute, local governments have broad discretion to determine what areas are at risk of flooding.

In practice, many jurisdictions in Virginia limit their regulation of development in floodplains to satisfy the minimum requirements of the National Flood Insurance Program (NFIP). In order to be eligible for federal flood insurance, local governments must impose special regulations on areas identified on floodplain maps by the Federal Emergency Management Agency (FEMA). FEMA, however, currently uses *historical* flood data to create flood maps. FEMA requires additional regulations in areas that have a one percent chance of flooding in any given year (the "100-year floodplain"). FEMA maps also designate other at-risk areas where FEMA does not require additional regulation, such as the "500-year floodplain" (areas that have a 0.2 percent chance of flooding).

Sea-level rise will increase the frequency, elevation and geographical scope of flooding. These risks are not *currently* accounted for in FEMA flood maps.

Therefore, local governments may want to take independent action to mitigate the future increased flood risks posed by sea-level rise. We have identified two actions local governments could take:

- *Increase regulation in the 100-year floodplain* – Localities could implement more stringent regulations in areas that are currently designated as floodplains. For example, localities could limit the density of development allowed in floodplains, increase setbacks, or require that structures be elevated above current requirements. Such actions also may have the additional benefit of making property eligible for insurance premium discounts through the NFIP's Community Rating System.

- *Regulate outside the 100-year floodplain* – Although local governments have authority to extend the boundaries of the regulated floodplain, there are practical barriers. First, Local governments may be hesitant to extend the boundaries of the regulated floodplain because this could impact the availability of credit and insurance in newly designated at-risk areas. Second, local governments would also need to compile evidence to determine the geographical boundary of the new flood risks posed by sea-level rise. This could require local government to independently develop maps and inundation models to justify increased regulation.

  To overcome this mapping obstacle, local governments may be able to use areas already designated on FEMA maps, such as the of the 500-year floodplain. Although FEMA does not require additional regulation in the 500-year floodplain, local governments could extend regulations to the 500-year floodplain in coastal areas.

4. Specific Land-Use Tools

Virginia localities also have a number of specific land-use tools that they can use to mitigate flood risks, such as: (1) setbacks, (2) transfer development rights, (3) tax incentives, and (4) open space easements. Although this list is not exhaustive, it includes the tools recommended in the state's adaptation strategy. These tools have the benefit of protecting against increased flood risks while respecting property rights.

a. Setbacks

Coastal setbacks prohibit development within a certain distance from the shore. Setback distances can be determined based upon the projected shoreline position assuming a specific sea-level rise and erosion rate over the life of a structure. Alternatively, Bay jurisdictions can require buffers as permitted by the Chesapeake Bay Preservation Act (CBPA). The CBPA allows localities to prohibit construction 100 feet from the edge of a wetland or shore. Although the purpose of the CBPA is to preserve water quality, these setbacks offer flood safety benefits as well.

b. Transfer Development Rights

Transfer development rights (TDRs) offer a means for localities to increase regulations in vulnerable areas while compensating landowners for their forgone development rights. Virginia localities have been delegated authority to use TDR programs; the statute allows local governments to use zoning ordinances to designate "sending areas" (where development is limited) and "receiving areas" (where development is encouraged). Property owners in sending areas can agree to restrict development and sell their development rights to other landowners who can use the rights to increase the intensity of development in a receiving area. To combat sea-level rise, a local government could designate vulnerable areas as "sending areas," and upland areas as "receiving areas."

c. Tax Incentives

Localities can also use tax incentives to encourage landowners to limit development in areas that are threatened by sea-level rise. The Virginia Code provides several different types of tax incentives:

- *"Use value" assessment* – Localities can create "special assessment districts" and lower taxes for landowners who agree to conserve their property as open space. Lower assessments account for the restrictions on the property's use, whereas property taxes are typically taxed based upon full development potential or market value. Localities would need to designate lands in vulnerable areas as special assessment districts in order to use this incentive scheme, and eligible properties must typically be larger than five acres.
- *Voluntary agreements* – Local governments can offer tax credits in exchange for a landowner's agreement to limit the density or use of a property.
- *TDR credits* – As an alternative to private sale of development rights under a TDR program, local governments can also offer tax credits. Local governments can reduce an owner's property taxes in proportion to the fair market value of the foregone development.
- *Wetlands* – Local governments can offer tax exemptions to owners who agree to preserve wetlands.

d. Open Space Easements

Local governments can purchase open space easements to protect areas with vulnerable natural resources. Typically, open spaces easements prohibit all development and are recorded to bind future owners.

However, local governments could create a new kind of open space easement that does not prohibit *all* development but, instead, allows for limited development on the upland portions of a property.

Conditions of the easement would require the landowner to mitigate potential impacts to natural resources from sea-level rise by: (1) prohibiting hard coastal armoring (e.g., sea walls), (2) permitting only soft armoring protections (e.g., dune construction or living shorelines), and/or (3) requiring that structures be removed if they come to encroach on public lands as the sea rises.

By creating more flexible terms, local governments can allow for present economic use of property while preserving the public's future interest in natural resources such as beaches and wetlands. Additionally, these easements could create a "rolling" boundary line that would shift with the changing shoreline. By using a natural boundary feature (such as the tideline or vegetative line), the local government can craft the easement such that the restrictions on the property would not be triggered until rising seas caused structures to encroach on public lands (impacts that may be decades in the future).

5. Conclusion

Although sea-level rise will put Virginia's communities at greater risk of flooding, the Commonwealth's local governments possess the tools necessary to begin to mitigate and manage these risks. Localities have existing legal authority to update their comprehensive plans and zoning ordinances to require that land-use decisions consider the effects of sea-level rise. Moreover, local governments have a number of land-use tools at their disposal that they can use to reduce the risks posed by sea-level rise and also protect landowners' economic interests.

I. INTRODUCTION

Many states, like Virginia, have begun or completed climate change adaptation plans. These plans raise a predominant legal question - can local governments use existing legal authority to implement adaptive measures or do state legislatures need to delegate new authority? As a first step to answering this question, the Georgetown Climate Center prepared this case study; we will subsequently use it to frame a comparison of land-use authority across multiple states. We chose to study Virginia because (a) its recent adaptation plan neatly raises the issues of local authority to adapt, and (b) Virginia is a Dillon Rule state, which means that Virginia courts take a conservative approach to interpreting delegations of authority to local governments. If local governments have existing authority in a Dillon Rule state, they are likely to have authority in other states as well. Finally, Virginia officials offered their support for this study, for which we are grateful.[1]

Coastal flooding in Virginia is increasing and will continue to do so over the coming decades. Sea levels are projected to rise 2.3 to 5.2 feet along Virginia's coasts by 2100.[2] This rate of sea- level rise is higher than the national average because land in Virginia is subsiding; groundwater withdrawal and tectonic activity are causing the land to sink.[3] As a result, Virginia will experience more destructive coastal erosion and flooding in the future, both in terms of magnitude and geographic scope. More flooding will require Virginia's localities to pay for expensive emergency response actions and replace damaged public infrastructure. Home and business owners will suffer property damage and may also find that their property becomes uninsurable. Ultimately, the rising threat of floods could cause significant economic hardship for many in Virginia.

Recognizing these impacts, the Virginia Governor's Commission on Climate Change (the "Commission") issued its 2008 *Final Report: A Climate Change Action Plan* (the *"Plan"*), which makes recommendations about how state agencies and local governments can begin to preemptively address climate change. The *Plan* recommends that Virginia's local governments begin to take action to protect people and property. The *Plan* calls on local governments to consider sea-level rise when making land-use decisions in comprehensive plans and zoning ordinances.[4] Local governments are also encouraged to consider implementing specific adaptation policies such as "tax incentives or mandatory setbacks to discourage new development in vulnerable coastal areas."[5]

In order to implement these recommendations, local authorities must have statutory authority, and local actions must be consistent with other state and federal laws and the Constitution. This study addresses the first question; do Virginia's local governments have authority to implement the *Plan's* recommendations?

Adaptation measures can be structural or non-structural. Traditionally, flood and erosion risks have been managed using structural techniques, such as sea walls and levees ("armoring"). However, decision-makers are recognizing its limitations: armoring is costly to build and maintain, can increase flooding of neighboring properties, and can increase risks to people and property from catastrophic failure as people tend to cluster development behind protective structures (as demonstrated by the catastrophic failure of levees in New Orleans during Katrina).[6] Armoring also has damaging environmental effects – sea walls erode beaches and drown wetlands which serve as natural buffers to flooding and important habitat.[7] Policy-makers acknowledge that, in certain instances, armored solutions may be necessary where critical public infrastructure or dense urban development is at risk. Increasingly, however, policy-makers are looking to non-structural solutions - this study focuses on those alternatives.

Many of the recommendations of Virginia's Plan focus on non-structural solutions to sea-level rise. Nonstructural solutions often involve changing land-use practices. Existing land-use laws can be used to ensure that development does not occur in highly vulnerable areas; or where development does occur, it is

less likely to be damaged.[8] To accomplish this, local governments would need to change the way they currently exercise their land-use authorities.

In the first section, this study discusses how Virginia local governments currently regulate the use and development of land. Localities already have broad authority to regulate land use to protect health and human safety, including authority to regulate for one of the primary impacts of sea-level rise, flooding.[9] At present, many local governments limit their regulation of "floodplains" to qualify for federal insurance, and floodplains are determined by using *historical* flood data. However, the use of historical data assumes static conditions, and in a world of sea- level rise, the future will look very different from the past. In order to adapt effectively, local governments need to consider *future* increased risks of inundation, flooding, erosion and storm surge.

Local governments must first determine whether they have sufficient legal authority. Virginia follows the Dillon Rule, meaning that local governments can only exercise those powers delegated by the General Assembly. In the second section, we examine the delegations of authority to local governments to regulate land use. We analyze local authority to (1) consider sea-level rise impacts in comprehensive plans, (2) impose more stringent regulations in existing floodplains, and (3) regulate in vulnerable areas not currently subject to floodplain regulations.

In the third section, we analyze whether the Dillon Rule poses an obstacle to local action. Many local governments fear that the Dillon Rule limits their regulatory choices. In practice, however, Virginia courts often defer to local exercise of police powers, and the Dillon Rule will likely not bar a locality from implementing adaptive measures.

We conclude that the delegations to local governments are likely expansive enough to allow local governments to consider future sea-level rise impacts. However, local governments would be on stronger footing and could avoid unnecessary lawsuits if the General Assembly gave them explicit authority to consider sea-level rise and other climate change impacts when planning and zoning.

In the fourth section, we examine the authority of local governments to implement specific land-use tools recommended by the *Climate Action Plan*, including: setbacks, tax incentives, transfer development rights and "rolling" open space easements. We do not analyze all of the tools available to local governments, but rather only those non-structural tools recommended by the Commission.

II. LEGAL BACKGROUND

1. Current Regulation of Land Use

Before we can answer the question of whether local governments have authority to consider future sea-level rise, it is necessary to understand how land use is currently regulated. In Virginia, local governments have primary land-use authority. The Virginia Code gives local governments[10] broad authority to guide the use and development of land through two frameworks: comprehensive plans and zoning ordinances (discussed in more detail below). Comprehensive plans establish the general "blueprint" for future community development.[11] This blueprint is legally implemented through zoning ordinances. Through zoning ordinances, local governments specify the particular uses that are permitted in different districts (or zones). Within each district, a different set of regulations (or development standards) governs how land may be used and developed.[12]

2. Current Regulation of Floodplains & the National Flood Insurance Program

The General Assembly specifically authorized local governments to regulate development in floodplains[13] in response to passage of the National Flood Insurance Program ("NFIP"). The NFIP, created by Congress in 1968, encourages local regulation of development in floodplains by offering the carrot of federally subsidized flood insurance. To make its citizens eligible to purchase flood insurance, local governments must impose minimum regulation on areas identified as "flood hazard areas" on flood insurance rate maps ("FIRMs").[14] The Federal Emergency Management Agency ("FEMA"), the agency charged with administering the NFIP, creates FIRMs using historical flood data.[15] FEMA designates as "flood hazard areas" those areas that have a one percent chance of flooding in any given year based upon historical averages (the so called "100-year flood plain").[16] FEMA also designates other areas at lower risk of flooding, but does not require additional regulation in those areas. For example, FEMA designates the "500-year flood plain" (areas that have a 0.2 percent chance of flooding).

FEMA establishes the minimum regulations that local governments must impose in order to qualify their community for federal insurance. However, local governments are free to impose more stringent regulations.[17] In practice, however, many local governments simply adopt FEMA's model floodplain ordinance and impose minimum regulations on development in flood hazard areas designated on the community's FIRM.

Localities' reliance on FIRMs means that current local regulations do not accurately manage the increased flooding the community is likely to experience as sea levels rise. FIRMs do not account for the increased frequency and geographic extent of future flooding, erosion and storm surge because they are created using historical data.[18] To mitigate these risks effectively, local governments need to change their current practices of regulating development for flood hazards.

III. LEGAL ANALYSIS

1. Background – the Dillon Rule

Before updating current practices, local governments must determine if they have sufficient legal authority. In Virginia, local government authority is limited by the Dillon Rule – local governments can only take action when they have been delegated authority to do so by the state legislature.[19] The Dillon Rule analysis has two parts. First, local governments may only exercise those *powers* expressly delegated by the legislature or those that may be fairly or necessarily implied from an express grant.[20] Second, when exercising their authority, local governments must choose a *method* that is consistent with the statutory authorization. When the legislature has specified no method, local governments have discretion to choose any method so long as it is reasonable.[21] A method is reasonable when it is consistent with the statute's purposes.[22] Local governments exercising powers outside their delegated authority can be sued, and courts will refuse to enforce such local actions.[23]

2. Do Local Governments Have the Authority to Consider Sea-Level Rise?

a. Land-Use Powers Generally

Virginia's local governments have sufficient authority to update current land-use practices to account for sea-level rise. The delegations of authority to local governments to plan and zone allow local governments to consider many criteria relevant to sea-level rise:

- In preparing comprehensive plans, local governments are directed to consider "the future requirements of [the] territory," and plans may designate areas for "conservation, recreation, and other areas."[24]

- Local governments may zone for purposes of facilitating "the creation of a convenient, attractive and harmonious community," protecting "against the loss of life, health or property from flood or other dangers," and providing "for preservation of … lands of significance for the protection of the natural environment," among other things.[25]

- In drawing and applying zoning ordinances, local governments may consider "the current and future requirements of the community… the conservation of natural resources, the conservation of properties and their values and the encouragement of the most appropriate use of land throughout the locality."[26]

Regulating for sea-level rise will not require local governments to exercise new powers. Local governments will simply be considering future flood risks to inform how they exercise traditional zoning and planning powers. Consideration of sea-level rise is consistent with the legislature's purpose for granting land-use powers because increased flooding and erosion will pose greater threats to the public health, safety and welfare.

Accounting for sea-level rise is also consistent with the criteria provided by the Code. When zoning and planning, local governments may explicitly consider future conditions and the conservation of natural resources.[27] Future flooding and erosion will inundate and flood coastal lands, impacting development and natural resources. In order to ensure the orderly development of the community, local governments must begin to plan for and manage these risks. When making zoning decisions, local governments may also consider property values and the preservation of the natural environment.[28] Sea-level rise will disrupt business, depress property values, and destroy vital infrastructure. Flooding and erosion will destroy valuable natural resources such as wetlands and beaches that provide important ecological, recreational, and economic benefits.[29] Using land-use powers to mitigate these impacts is consistent with the goals and criteria articulated by the statute.

b. Flood Hazard Regulation

Local governments have explicit authority to zone and plan for one of the primary impacts of sea-level rise: flooding. From a purely legal standpoint,[30] the Code grants local governments broad authority to consider flood risks when planning and zoning:

- In comprehensive plans, local planning commissions can designate floodplain areas.[31]

- Zoning ordinances may be designed to provide for safety from flood, provide adequate flood protection, and protect against loss of life and property from flood.[32]

- In creating districts, local governments may consider the "preservation of floodplains," among other things.[33]

- Within each district, local governments can regulate the use and development of land and may specifically regulate development in floodplains.[34]

Further, the Code provides no guidance or criteria for how flood risks should be assessed; floodplains are simply defined as "those areas…which are likely to be covered by floodwaters."[35] The Code does not specify the boundaries of the floodplain nor the method by which flood risks should be calculated. Thus, consistent with the Dillon Rule, localities can choose any *reasonable method* for assessing flood risks,[36] so long as the chosen method is consistent with the statute's purposes of mitigating flood impacts.[37]

Regulating based upon projections of anticipated sea-level rise is consistent with a plain reading of the statute. Such method would incorporate the most up-to-date scientific methods of calculating flood risks. By accounting for future risks, localities will be fulfilling the statutory directives to consider the future needs of the community, protect people and property, and conserve valuable natural resources.[38]

3. How Can Local Governments Change Land-Use Practices to Account for Sea-Level Rise?

Local governments could use planning and zoning powers to implement adaptive measures. This section discusses how local governments could (1) incorporate sea-level rise considerations in comprehensive plans, (2) increase regulations in the existing floodplain, and (3) use alternative zoning methods to regulate development in vulnerable areas.

a. Comprehensive plans

Virginia local governments could use comprehensive plans to:

- Establish the rate of estimated sea-level rise and time period over which it may occur.
- Designate areas vulnerable to sea-level rise.
- Site future public infrastructure and capital improvements out of harm's way.
- Provide the scientific basis to justify changes in land use decision-making, including an analysis of likely sea-level rise hazards (inundation, flooding, erosion), and vulnerabilities (to specific areas, populations, structures and infrastructure).
- Plan responses to sea-level rise.

b. Zoning Ordinances & Floodplain Regulations

Local governments could also increase regulations in the 100-year floodplain. Localities could amend zoning ordinances to require increased building elevations and setbacks, require that structures be flood-proofed, and reduce densities and intensity of use.[39] Communities will also receive insurance benefits for taking these measures. Communities that institute increased floodplain regulations are eligible for insurance premium discounts through the NFIP's Community Rating System.[40]

Over the long-term, localities may also want to extend the boundaries of the regulated floodplain.[41] FEMA maps will present an obstacle to this approach. Because FIRMs do not account for future risks, local governments will need to compile evidence to determine the geographical boundary of areas vulnerable to impacts. This may require localities to create their own flood maps.[42] As a result, localities will be more limited in their ability to regulate outside the 100-year floodplain.[43]

c. Alternative Methods of Regulating Land Use in Vulnerable Areas

As an alternative, local governments could impose regulations in the "500-year floodplain." To maintain eligibility for federal flood insurance under the NFIP, local governments need not impose additional regulations on development in the 500-year floodplain in coastal areas. The NFIP, however, does not preempt local governments from imposing regulations in these areas. This method is advantageous because these areas are already designated on FIRMs.

4. Potential Legal Obstacles

a. Dillon Rule – Case Law Interpreting Local Powers

i. Land-Use Cases

The Dillon Rule is unlikely to be an obstacle for local governments that want to mitigate the effects of sea-level rise. Although the Dillon Rule is a rule of "strict construction,"[44] Virginia's courts are generally deferential to localities when they regulate land use to protect public health, safety and welfare. The Supreme Court of Virginia has recognized that localities cannot be hamstrung when they regulate land use.[45] Consistent with this position, localities may address potentially harmful circumstances or phenomena even though the legislature did not explicitly identify them in the Code. Virginia's highest court explained that, when a locality regulates physical hazards, "specificity is not necessary even under the Dillon Rule."[46] Thus, although localities have no explicit instructions to mitigate the impacts of sea-level rise, the Dillon Rule probably does not prevent them from doing so.

Virginia's courts have only struck down land-use ordinances in two instances: where localities have implied a *power*[47] or used a *criterion*[48] not authorized by the statute. For example, the County of Fairfax was found to have impermissibly implied a power when it required a landowner to dedicate roads using its powers to grant special exceptions.[49] Courts have also struck down zoning ordinances where localities used unauthorized criteria to create zones, such as socioeconomic considerations.[50]

Accounting for sea-level rise would not require local governments to imply new powers or impose new criteria. Localities would simply be using traditional land-use powers to regulate development in light of new scientific understanding of flood and other risks. Moreover, accounting for se- level rise involves consideration of criteria specifically authorized by the statute, such as the risk of flooding and future conditions.[51]

ii. Cases Narrowly Construing Local Authority

Outside the land-use context, the Supreme Court of Virginia has used the Dillon Rule to construe local authority narrowly in two cases, *Commonwealth v. County Board of Arlington* ("*Arlington*")[52] and *Arlington County v. White* ("*White*").[53] These cases could be used to challenge a local government's consideration of sea-level rise in its zoning ordinance. In *Arlington,* the court rejected the county's argument that a general grant of authority to supervise schools authorized the school board to enter into collective bargaining agreements.[54] Similarly, in *White,* the court struck down a county's extension of benefits to "interdependent" same-sex domestic partners even though the statute at issue authorized provision of benefits to "dependants" of county employees.[55] The court emphasized that the county's program was clearly at odds with the legislature's understanding of the term "dependant" at the time the statute was enacted.[56]

Using *Arlington* and *White*, opponents of new flood hazard ordinances might argue that consideration of sea-level rise simply could not have been contemplated by the legislature when the floodplain provisions were enacted. More specifically, opponents could argue that because localities were granted authority to regulate floodplains in response to passage of the NFIP, the term "floodplain" should be limited to FEMA's definition (*i.e.*, the 100-year floodplain).

These arguments, however, rely on a limited definition of the term floodplain, which is not reflected in the statute.[57] Such an interpretation would prevent local governments from managing risks in all areas subject to flooding.[58] And, flood risks are only one of the many criteria localities may consider.[59] As discussed above, localities may consider many other factors that are consistent with mitigating the effects of sea-level rise, such as the future needs of the community and impacts to natural resources.[60]

Even the strict application of the Dillon Rule, as applied in *Arlington* and *White*, seems unlikely to prevent localities from considering sea-level rise. These cases involve the provision of benefits, whereas changing flood regulations is an exercise of a locality's police powers. Courts typically defer to localities' exercise of their police powers.[61] Furthermore, in both cases, the local government tried to imply powers that were different in kind from those traditionally exercised (e.g., using collective bargaining agreements versus traditional employment contracts). In contrast, mitigating the effects of sea-level rise involves the exercise of traditional land-use powers. Finally, in *Arlington* and *White*, the legislative history clearly showed the legislature did not intend to authorize the powers being questioned. There is no clear history of the legislature's understanding of the term "floodplain." In sum, it is unlikely that a reasonable court would prohibit a local government from regulating for the increased risks posed by sea-level rise.

b. Evidence Needed To Support Zoning Changes

Local governments will also have to meet substantive due process requirements when regulating for future impacts.[62] Local governments must show that regulations are substantially related to a legitimate public purpose.[63] Courts presume that land-use regulations are valid. However, if challenged, a locality must show that it is "fairly debatable" that the regulation is reasonable.[64] Local governments cannot rely on conclusory statements that more stringent regulations will offer greater protection.[65] Rather, localities need evidence that shows specific harms will be averted by more stringent zoning regulations.[66]

The precise details of what evidence localities will need to justify regulating for sea-level rise are outside the scope of this paper. These evidentiary questions are of great concern to localities. Developing maps and inundation models could, potentially, comprise a substantial portion of the costs of implementing adaptation policies. Consequently, this issue will be the subject of a future study by the Georgetown Climate Center.

5. Specific Land-Use Tools that Local Governments Could Use to Adapt to Sea-Level Rise

The Virginia Code provides localities with a variety of land-use tools that could be used to mitigate the impacts of sea-level rise. This case study examines the four tools identified in the state's *Climate Action Plan*: (1) setbacks, (2) tax incentives, (3) transfer development rights, and (4) rolling easements.[67] This section analyzes the existing statutory authority of local governments to use these tools.[68]

a. Setbacks

Setbacks are building restrictions that establish a distance from a boundary line where land owners are prohibited from building structures. In urban areas, the boundary line is typically a street. With coastal properties, the boundary line is often a shoreline feature (such as the tideline or vegetative line).[69] To address sea-level rise, localities could create a dynamic coastal setback. Setbacks could be determined based upon a projected shoreline position that assumes a specific sea-level rise and erosion rate over the life of the structure (e.g., 30 years based upon the average length of a mortgage).

Section 15.2-2279 of the Virginia Code authorizes local governments to "regulate the building of houses in the locality, including . . . minimum setbacks. . . ." The Code does not provide any method for establishing minimum setbacks. Thus, consistent with the Dillon Rule,[70] local governments have discretion to determine the method of establishing minimum setbacks.[71]

The Chesapeake Bay Preservation Act ("CBPA") also permits jurisdictions to require that development adjacent to the Bay include a 100 foot buffer measured inland from the edge of wetlands, shores or streams.[72] Bay jurisdictions could use these buffers to protect against flood risks posed by sea-level rise.

The explicit purpose of the CBPA is to protect the water quality of the Bay,[73] which would be degraded if rising sea levels inundate wetlands that filter runoff. As a result, CBPA buffers could serve two purposes: they would enhance water quality while providing important flooding protections to vulnerable bay-front properties.

b. Transfer Development Rights

The Virginia Code allows local jurisdictions to create Transfer Development Rights ("TDR") programs. TDR programs offer a means for localities to increase regulation in vulnerable areas while compensating landowners for their foregone development rights. The TDR statute enables local governments to designate, in zoning ordinances, "sending areas" (where development is limited) and "receiving areas" (where development is encouraged).[74] Landowners in sending areas can agree to restrict development and sell their development rights to other landowners.

Title 15.2, Article 7.1 of the Virginia Code ("TDR statute") expressly permits local governments to create TDR programs.[75] Receiving areas and sending areas must be designated in the locality's comprehensive plan.[76] The ordinance enabling the TDR program must provide for the creation of instruments that sever the development rights and allow for their transfer and use by other parties.[77] Landowners must also grant an easement limiting the use and development of the sending property in perpetuity and binding on future owners.[78]

Local governments could create TDR programs to address sea-level rise.[79] To implement such a program, local jurisdictions would first need to increase regulation in vulnerable areas. These vulnerable areas would be designated as sending areas in the zoning ordinance. At the same time, the locality would need to designate upland receiving areas appropriate for intensified use or density. Rather than develop at the lower zoning classification, affected property owners could sell their development rights and receive compensation from upland property owners. Using such a mechanism would allow local governments to preserve vulnerable properties while diffusing costs in a private market.[80]

c. Tax Incentives

i. Use value assessments

Multiple sections of the Virginia Code permit local governments to use tax incentives to manage land use. Localities can lower tax assessments for owners who preserve property as open space by taxing the property based upon its "use value."[81] Taxes are normally assessed based on a property's fair market value and account for the property's development potential. Taxes based upon "use value" assess the property based upon its current use only, not its potential use. Local governments could use these tax incentives to encourage owners of low-lying coastal lands to preserve these properties as open space or farmlands, rather than develop these lands.

The statute has some limitations, however. Typically, the property must: (1) be at least five acres, (2) lie within a special assessment district in the jurisdiction's zoning ordinance, (3) have restrictions recorded against it, and (4) meet use restrictions specified by the land-use classification.[82] To be eligible, the property must be preserved for one of the following purposes: park or recreational purposes, conservation land, floodways, wetlands, riparian buffers, or to assist in future community development.[83] Use value assessments would be most useful for encouraging the preservation of vulnerable undeveloped land.

ii. Wetlands tax exemptions

Localities can also offer tax exemptions to owners who agree to preserve wetlands[84] and riparian buffers.[85] The landowner must grant the locality an easement allowing the property to be inundated.[86] The portion of the property that is subject to the easement can then be exempted from property taxes by the local government.[87] Communities exposed to greater flood risks due to sea-level rise would benefit

from the preservation of wetlands and riparian buffers because these features can take up and slowly dissipate floodwaters.

iii. Voluntary agreements

Section 15.2-2286 of the Virginia Code permits local governments to offer tax credits in exchange for *voluntary agreements* to downzone property.[88] This device could be used to encourage landowners to voluntarily restrict the use or density of their property. However, transaction costs might limit localities' ability to use these agreements on a widespread basis; negotiating with individual landowners may be expensive and time-consuming.

iv. TDR Tax Credits

As an alternative to the private sale of development rights under a TDR program, local government can also offer tax credits. Localities can reduce an owner's property taxes in proportion to the fair market value of the foregone development.[89] These abatements could increase the feasibility of administering a TDR program because they allow local governments to use a tax-based incentive as an alternative to exclusive reliance on a private market. As a result, local governments have several different types of tax incentives that they could use to offset the costs to landowners from development restrictions in vulnerable areas.

d. Rolling Easements

i. What Are Rolling Easements?

The *Climate Action Plan* also suggests that local governments consider using "rolling easements." Rolling easement policies could take many forms.[90] Virginia's local governments (alone or in partnership with local land trusts) have existing authority to enter into *voluntary* transactions with private land owners to acquire "rolling" open space easements across vulnerable coastal properties.[91] Rolling easements have been proposed because they hold the promise of protecting current private rights to develop property while also preserving the public's future interest in public lands (such as wetlands and beaches). However, at present, rolling easements are a legal theory. Unlike the land-use tools discussed above, no local government currently uses rolling easements. In fact, the tool has not even been clearly defined.

Courts and scholars use the term "rolling easements" to describe easements that have a boundary line that "rolls" with the tides.[92] These easements are grounded in the common law public trust doctrine.[93] Under the public trust doctrine, when each state entered the Union, courts recognized state sovereignty over lands underlying navigable waters and these lands are held in trust by the state for the benefit of the public.[94] In Virginia, lands seaward of the mean low water line ("MLWL") are public lands held by the Commonwealth.[95]

Virginia's local governments could implement a voluntary program to acquire recordable easements in which sellers agree to limit development on waterfront property in exchange for compensation or tax incentives.[96] Conditions of the easement would require the landowner to mitigate potential impacts to natural resources from sea-level rise by: (1) prohibiting hard coastal armoring (e.g., sea walls), (2) permitting only soft armoring protections (e.g., dune construction or living shorelines), and/or (3) requiring that structures be removed if they come to encroach on public lands as the sea rises.[97] The easement would "roll" because it would ensure that the boundary of the burdened property naturally migrates as the MLWL moves inland.[98]

Rolling easements could facilitate adaptation to sea-level rise in many ways. For landowners, they set expectations that structures will need to be removed in the future due to rising water levels, and they offer advance compensation to property owners who agree not to protect their property using armoring. Rolling easements also allow coastal property owners to continue the current economic use of property

while preserving the public's future interest in natural resources such as beaches and wetlands. The rolling boundary line balances private and public interests because development restrictions are not triggered until rising seas cause structures to encroach on public land (impacts that may be decades in the future). For its part, the government receives assurances that coastal development will not be maintained in a manner that threatens coastal resources. Furthermore, by providing advance notice to coastal property owners, governments can avoid potential litigation and backsliding in the event the easement terms need to be enforced.[99]

A "rolling easement," as a recordable property interest, has not been tested under Virginia law. In order for local governments to create a recordable easement that rolls with the tide, two legal issues must be resolved. First, rolling easements must be a property interest recognized and enforced by Virginia courts.[100] Second, public entities must have adequate statutory authorization to acquire and hold this unique interest in land.

ii. Rolling Easements as an Enforceable Property Interest

The first issue is whether courts would enforce such a property interest. A property interest must be recognized under common law or created by statute in order to be enforceable.[101] Landowners cannot create novel property interests.[102] A rolling easement would constitute a type of "negative in gross easement" that was not recognized at common law.[103] However, as discussed in the next section, the Open Space Land Act ("OSLA") might create a statutory basis for the recognition of rolling easements.

iii. Use of Existing Authority to Acquire Rolling Easements

Although local governments likely cannot imply the authority to create a new property interest from the Code's broad delegation to acquire property,[104] they are empowered to hold and acquire *existing* property interests, such as easements. The Virginia Code generally authorizes state and local agencies to hold different interests in property. Title 15.2 broadly local governments "to acquire … title to, or *any interests* or rights of less than fee-simple title in, any real property within its jurisdiction, for any public purpose."[105]

Specifically, the OSLA granted state agencies and local governments[106] the authority to create and hold negative easements to conserve property.[107] These easements are "in gross" meaning they are personal to the government entity and do not require ownership of an adjacent parcel.[108] Virginia Code Section 10.1-1700 authorizes state and local governments to acquire "open space easements" defined as:

> non-possessory interest[s] in real property, whether appurtenant or *in gross*, acquired through gift, purchase, devise or bequest *imposing limitations or affirmative obligations,* the purposes of which include retaining or protecting natural or open-space values of real property, assuring its availability for agricultural, forestal, recreation, or open-space use, protecting natural resources, maintaining or enhancing air or water quality. . .

"Open-space land" is further defined as:

> [l]and which is provided or preserved for (i) park or recreational purposes, (ii) conservation of land or other natural resources, (iii) historic or scenic purposes, (iv) assisting in the shaping of the character, direction, and timing of community development. . .

An argument could be made that rolling easements are simply a variant of open space easements. Rolling easements would be used to ensure that public trust lands are preserved as open space. Armoring prohibitions ensure that the MLWL can continue to migrate inland as the seas rise, and removal requirements ensure that public trust lands remain free of encroachments.

These types of restrictions are consistent with the OSLA. The Act allows for creation of in gross easements that can be held by state and local entities for specific purposes. The Act further authorizes open space easements to impose both affirmative and negative obligations, which would seemingly authorize use of covenants to limit development (negative) and require removal of structures (affirmative). Finally, rolling easements would serve the purposes of the Act. Rolling easements function to protect public trust lands for recreational and conservation purposes. The easements also assist orderly development by balancing the private land owner's present interest to develop property with the public's future interest in state public trust lands.[109]

iv. Case Law Supporting Creation of Rolling Easements

A recent Virginia Supreme Court decision may lend further support for creation of rolling easements using the OSLA. In *United States v. Blackman*,[110] the court recognized a conservation easement that was created *before* enactment of the Virginia Conservation Easement Act.[111] The landowner sued to challenge the validity of the easement, arguing that, at the time of the original grant, Virginia law did not recognize negative in gross easements.[112] The court rejected this argument and found that both the Virginia Code and the state's constitutional public trust doctrine supported enforcement of the easement.[113] The court found that the legislature specifically abrogated the common law prohibition against transfer of easements in gross when it amended Section 55-6 of the Virginia Code to provide: "[a]ny interest in or claim to real estate, including easements *in gross*, may be disposed of by deed or will."[114] Furthermore, the court found that the Virginia public trust doctrine supported creation of easements designed to conserve land and preserve historic buildings."[115] Thus, the court found that the Blackman easement was not of "novel character" because it was "consistent with the statutory recognition of negative easements in gross for conservation and historic purposes."[116]

Blackman may support an argument that rolling easements are not a "novel" property interest, but merely a variant of open space easement recognized under Virginia law. As discussed above, rolling easements are consistent with the policy goals of the OSLA and the Commonwealth's public trust doctrine. The Act itself also explicitly authorizes governmental entities to create easements with both affirmative and negative covenants.[117] *Blackman* suggests that rolling easements may be created under existing statutory authority.

IV. CONCLUSION

Rising sea levels pose risks to Virginia's coastal communities, and local governments possess existing authority under land-use statutes to address these risks. The Virginia Code delegates broad authority to local governments to regulate land use, which reasonably permits consideration of sea-level rise. Local governments could use comprehensive plans to anticipate impacts. Local governments could also begin to impose additional land-use regulations in vulnerable areas.

Virginia localities also have a suite of land-use tools that could be used to adapt: setbacks, transfer development rights, tax incentives and open space easements.

The Dillon Rule should not pose a barrier to localities using sea-level rise estimates to regulate for flood risks in their communities. However, the General Assembly could provide localities with more certainty and avoid unnecessary lawsuits by providing its localities with explicit authority to consider climate change when zoning and planning.

In sum, although the threat of sea-level rise seems daunting, local governments have sufficient existing authority to begin taking critical actions to adapt now.

END NOTES

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[2] Chesapeake Bay Program Sci. & Technical Advisory Comm., *Climate Change and the Chesapeake Bay: State of the Science Review and Recommendations* 5 (2008); Governor's Comm'n on Climate Change, *Final Report: A Climate Change Action Plan* 5-7 (2008).

[3] Chesapeake Bay Program Sci. & Technical Advisory Comm., *supra* note 2, at 21; s*ee* U.S. Climate Change Sci. Program, *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* 18 (Jan. 2009).

[4] *Climate Action Plan* Recommendation 14C states: "Local governments in the coastal area of Virginia should include projected climate change impacts, especially sea-level rise and storm surge, in all planning efforts, including local government comprehensive plans and land-use plans. Local governments should revise zoning and permitting ordinances to require projected climate change impacts be addressed in order to minimize threats to life, property, and public infrastructure and to ensure consistency with state and local climate change adaptation plans." Governor's Comm'n on Climate Change, *supra* note 2, at 35.

[5] Recommendation 14T provides, in pertinent part: "local agencies should establish policies such as rolling easements, tax incentives, or mandatory setbacks to discourage new development in vulnerable coastal areas." *Id.* at 37. Recommendation 14T also called on state agencies to implement these policies. However, this study focuses on local authority because local governments in Virginia are primarily responsible for regulating land use.

[6] John S. Jacobs & Stephanie Showalter, SeaGrant, *The Resilient Coast: Policy Frameworks for Adapting the Built Environment to Climate Change and Growth in Coastal Areas of the U.S. Gulf of Mexico* 7- 9 (2007).

[7] *See generally* Nat'l Research Council, *Report In Brief: Mitigating Shore Erosion on Sheltered Coasts* (2007).

[8] This study focuses on non-structural solutions that discourage new development in vulnerable areas or require more resilient structure design. Other non-structural solutions require the eventual upland relocation of structures, commonly referred to as "planned" or "managed retreat." Local governments may have more limited authority to implement retreat options under existing laws; and, therefore, these options are not a primary focus of this study. "Rolling" open space easements, as discussed *infra* Part III.E.4., may be a useful tool in implementing a retreat strategy.

[9] *See* Va. Code Ann. § 15.2-2280 *et seq*.

[10] Title 15.2 of the Code delegates powers to local governments to govern their jurisdictions. Local governments can be municipalities or counties. Section 15.2-2210 authorizes local governments to create planning commissions to advise the governing body and promote the orderly development of the community. This study refers to these different entities, collectively, as the "local government" or "localities."

[11] *See* Va. Code Ann. §§ 15.2-2223 to -2232.

[12] *See id*. §§ 15.2-2280 to -2316.

[13] Flood plains comprise all areas bordering water bodies (coasts or rivers) that periodically flood. Due to topographical conditions, lower elevation areas flood more frequently. Only these higher-risk areas are subject to additional regulation under the National Flood Insurance Program ("NFIP," discussed below). Fed.

Interagency Floodplain Mgmt. Task Force, *Protecting Floodplain Resources – A Guide Book for Communities* 5 (Jun. 1996).

[14] 42 U.S.C. § 4022(a)(1); 44 C.F.R. § 64.1.

[15] *See generally* 44 C.F.R. § 64.3(a)(1) (describing contents of Flood Insurance Rate Maps).

[16] Nat'l Flood Ins. Program, *Flooding & Flood Risks: Understanding Flood Maps*, at http://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/understanding_flood_maps.jsp (viewed Nov. 28, 2009); *see e.g.*, Hampton City, Va. Code § 17.3-33(17) (calculating the hundred year tidal flood "based on tidal heights known to have happened in the area").

To account for differences in the risk of flooding, FEMA also divides the floodplain up into different zones. Fed. Interagency Floodplain Mgmt. Task Force, *supra* note 13, at 5. The 100-year designation was chosen because it was seen to provide a high level or protection without imposing overly onerous requirements on property owners. Fed. Emergency Mgmt. Agency, *National Flood Insurance Program – Program Description* 5 (Aug. 2002). However, the 100-year designation does not account for the totality of food risks across the entire flood plain. In large storm events, higher elevations may flood. FEMA designates these areas as well (e.g., 500-year flood plain), but does not require regulation in these areas.

These differences in the definition of the term "floodplain" may be problematic when interpreting the authority of Virginia local governments. The statute generically uses the term "floodplain" and does not specify any method by which local governments should determine floodplain boundaries or an areas risk of flooding. *See* discussion *infra* Part III.B.2.

[17] *See* 42 U.S.C. § 4022(b)(1)(A) (encouraging local governments to reduce flood risks beyond the minimum NFIP criteria). NFIP includes a sub-program known as the Community Rating System ("CRS"). CRS provides incentives to localities increase regulations in flood plains above the minimum requirements of the NFIP. *Id*. The incentives take the form of insurance premium credits that are made available to consumers in participating jurisdictions. *Id.* § 4022(b)(2). In future research, we will analyze how local governments can use the Community Rating System program to implement adaptation measures.

[18] Fed. Emergency Mgmt. Agency, *Projected Impact of Relative Sea Level Rise on the National Flood Insurance Program* 2 (Oct. 1991).

[19] The rule is named for Iowa Supreme Court Chief Justice John Forrest Dillon, whose writings inspired the Virginia Supreme Court to adopt a rule limiting the authority of localities to govern their jurisdictions. City of Winchester v. Redmond, 93 Va. 711 (1896). The Dillon Rule is a rule of statutory interpretation that courts use to strictly construe the grant of authority to local governments. Under the Dillon Rule, local governments may exercise only those powers: (1) granted in express words, (2) that can be fairly implied from express words, or (3) that are essential to exercising expressly granted powers. City of Virginia Beach v. Hay, 258 Va. 217, 222 (1999); *see also* Va. Jockey Club v. Va. Racing Comm'n, 22 Va. App. 275, 287 (1996) (applying the same standard to state agencies). By contrast, some states have what is known as "home rule," whereby localities are found to possess broad authority to address matters of local concern without need for specific delegations of power from the state legislature. *See generally* Local Government Law § 4:2 (2010) (discussing home rule and the different ways it may be conferred upon local governments).

[20] *Hay*, 258 Va. at 222.

[21] *See* Arlington County v. White, 259 Va. 708, 712 (2000); *see also Hay*, 258 Va. at 221.

[22] Courts will look to see if the method chosen is consistent with the "ends sought to be accomplished by the grant of the power." In *Hay*, the City Charter authorized the city to "create a department of law" and "provide for" city attorneys and other employees. The Court found that *appointing* attorneys was a reasonable method of hiring because it did not "expand the implied power to hire beyond that … needed to implement the authority to provide for a department of law given." *See* 258 Va. at 222-23.

[23] *Cf. White*, 259 Va. at 714 (affirming declaration that Arlington County acted outside its authority and enjoining the county from enforcing the ordinance).

[24] Virginia Code Section 15.2-2223 provides, in pertinent part:

> The local planning commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction and every governing body shall adopt a comprehensive plan for the territory under its jurisdiction.
>
> In the preparation of a comprehensive plan, the commission shall make careful and comprehensive surveys and studies of the *existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants*…
>
> The plan … shall show the locality's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:
>
> 1. The designation of areas for various types of public and private development and use, such as different kinds of residential; *conservation;* active and passive *recreation*; public service; *flood plain and drainage*; and other areas…

(emphasis added).

[25] Virginia Code Section § 15.2-2283 provides:

> [Zoning] ordinances shall be designed to give reasonable consideration to each of the following purposes, where applicable: (i) to provide for … safety from … *flood*… and *other dangers*; (iii) to facilitate the *creation of a convenient, attractive and harmonious community*; (iv) to facilitate the provision of adequate … *flood protection* . . . (vi) to protect against . . . loss of life, health, or property from . . . *flood*, impounding structure failure . . . (viii) to provide for the *preservation* of agricultural and forestal lands and other lands of significance *for the protection of the natural environment* . . .

(emphasis added).

[26] Virginia Code Section 15.2-2284 directs local governments to consider different needs of the community when they draw their zoning districts. The needs to be considered include:

> the existing use and character of property, the comprehensive plan, the suitability of property for various uses, the *trends of growth or change*, the *current and future requirements of the community* as to land for various purposes . . . the *conservation of natural resources*, *the preservation of flood plains*, . . . the *conservation of properties and their values* and the encouragement of the most appropriate use of land throughout the locality.

(emphasis added).

[27] *See* Va. Code Ann. §§ 15.2-2283 to -2284

[28] *See id.* §§ 15.2-2283 to -2284.

[29] U.S. Climate Change Sci. Program, *supra* note 3, at 21.

[30] *See* discussion of practical impediments created by NFIP *infra* Part II.B.

[31] Va. Code Ann. § 15.2-2223; *see supra* note 24.

[32] Virginia Code Section 15.2-2283 provides:

> [Zoning] ordinances shall be designed to give reasonable consideration to each of the following purposes, where applicable: (i) to provide for … safety from … *flood* … (iv) to facilitate the provision of adequate … *flood protection* . . . (vi) to protect against . . . loss of life, health, or property from . . . *flood*, impounding structure failure . . .

(emphasis added).

[33] Va. Code Ann. § 15.2-2284; *see supra* note 26.

[34] Virginia Code Section 15.2-2280 provides, in pertinent part:

> Local governments, within each district, may regulate:
> 1. The use of land, buildings, structures and other premises for…*flood plain* and other specific uses;
> 2. The size, height, area, bulk, location, erection, construction, reconstruction, alteration, repair, maintenance or removal of structures;
> 3. The areas and dimensions of land, water and air space to be occupied by buildings, structures and uses, and of courts, yards and other spaces to be left unoccupied by uses and structures…

(emphasis added).

[35] Va. Code Ann. § 10.1-600 ("'Flood hazard area' means those areas susceptible to flooding. 'Flood plain' or 'flood-prone areas' means those areas adjoining a river, stream, water course, ocean, bay or lake which are *likely to be covered by floodwaters.*") (emphasis added).

[36] *Hay*, 258 Va. at 221.

[37] *See id.* at 222; *see also supra* Part III.A.

[38] Local governments are directed to consider the "probable future requirements" of their communities, when planning, Va. Code Ann. § 15.2-2223, and to account for "current and future requirements of the community" when zoning. *Id.* § 15.2-2284. In reading the statute as a whole, this language seems to authorize localities to be forward-looking. Thus, an interpretation of the term floodplain to allow localities to consider future conditions when calculating flood risks is consistent with the statute. *See Hay* 258 Va. at 222-23.

[39] *See e.g.,* U.K. Dep't for Cmtys. and Local Gov't, *Improving the Flood Performance of New Buildings* 53-83 (May 2007); *see also* Lloyd's, *Coastal Communities and Climate Change: Maintaining Future Insurabilit*y 10 (Sep. 2008).

[40] *See generally* Fed. Emergency Mgmt. Agency, *National Flood Insurance Program Community Rating System: A Local Official's Guide to Saving Lives Preventing Property Damage Reducing the Cost of Flood Insurance* (2006).

[41] Rather than formally extending the regulatory floodplain, localities could create sea-level rise overlay zones. Overlay zoning is a land-use tool whereby additional regulatory requirements are superimposed on existing districts to supplement regulation of areas with special characteristics. Virginia localities use overlay zones to protect, among other things, historic districts and natural resources. *See e.g.,* Fairfax County, Va. Zoning Ordinance, §§ 7-200 to -300. In the context of sea-level rise, localities could use overlay zones to protect areas that serve as import flooding buffers, or to designate areas appropriate for protection or retreat strategies. However, overlay zones are problematic because they still require localities to determine the boundaries of potentially impacted areas.

[42] The NFIP's definition of "flood plain" could also be used to challenge new sea-level rise regulations using the Dillon Rule, *see infra* Part III.D.2.

[43] Extending the boundaries may also impact the availability of insurance and credit in newly regulated areas. However, private insurers are already considering how sea-level rise will impact actuarial rates and are encouraging adaptation efforts as a means to reduce future losses and claims. *See* Lloyd's, *supra* note 39.

[44] City of Chesapeake v. Gardner Enter., 253 Va. 243, 256 (1997).

[45] *See id.* at 247 (1997) ("The statute must be given a rational interpretation consistent with its purposes, and not one which will substantially defeat its objectives.").

[46] Res. Conservation Mgmt., Inc. v. Bd. of Supervisors of Prince William County, 238 Va. 15, 22 (1989) (upholding a zoning ordinance that prohibited land fills in certain districts even though this use was not explicitly listed in the enabling statute).

[47] *See* Cupp v. Bd. of Supervisors of Fairfax County, 227 Va. 580 (1984); *see also* Bd. of Supervisors of Augusta County v. Countryside Inv. Co., 258 Va. 497 (1999) (finding that a locality could not use its subdivision ordinance to regulate the size and shape of individual parcels when the statute only allowed localities to promulgate "reasonable regulations" to promote "drainage and flood control and other public purposes"); Hylton Enter., Inc. v. Bd. of Supervisors of Prince William County, 220 Va. 435 (1979) (holding that localities' power to coordinate streets and regulate their grading in subdivision ordinances did not permit them to require payment for road improvements as a condition of subdivision approval).

[48] *See* Bd. of Supervisors of James City County v. Rowe, 216 Va. 128 (1975) (denying localities' authority to zone on the basis of aesthetics); Bd. of Supervisors of Fairfax County v. DeGroff Enter., Inc., 214 Va. 235 (1973) (prohibiting localities from zoning based on socioeconomic considerations); Bd. of County Supervisors of Fairfax v. Carper, 200 Va. 653 (1959).

[49] *Cupp*, 227 Va. 580 (1984).

[50] *Id.* at 661; *see Rowe*, 216 Va. 128; *DeGroff Enter*., 214 Va. 235.

[51] *See, e.g.,* Va. Code Ann. § 15.2-2283(iii) (stating zoning ordinances may provide for, among other things, "the provision of… adequate flood protection."); *see supra* note 32.

[52] 217 Va. 558 (1977).

[53] 259 Va. 708 (2000).

[54] *Arlington*, 217 Va. at 576-81 (The court noted that the legislature had rejected several proposals to permit collective bargaining agreements, and moreover, an opinion authored by the Attorney General memorialized this legislative history).

[55] *White*, 259 Va. at 711, 714.

[56] As was the case in *Arlington*, the court relied heavily on the Attorney General's opinions. *Id.* at 713-14.

[57] Va. Code Ann. § 10.1-600 ('Flood plain' means those areas which are "likely to be covered by floodwaters"); see *supra.* note 35.

[58] The 2009 Nor'easter in Virginia demonstrated that the 100-year flood designation does not account for the full extent of flood risks faced by a community. FEMA estimates that 20 percent of damage was not covered by insurance and 25 percent of flood insurance claims came from areas outside the 100-year flood plain. Fed. Emergency Mgmt. Agency, *Flood Insurance and Mitigation Save Taxpayer Dollars for Tidewater and Poquoson* (Mar. 30, 2010).

[59] *See supra* notes 24 - 26.

[60] *See supra* notes 24 - 26.

[61] *See*, *e.g.*, Stallings v. Wall, 235 Va. 313, 317-18 (1988).

[62] The Fourteenth Amendment to the U.S. Constitution provides that no state "shall… deprive any person of life, liberty, or property, without due process of law." U.S. Const. amend. XIV, § 1. Similarly, the Virginia Constitution provides that "no person shall be deprived of his life, liberty, or property without due process of law." Va. Const. art. I, § 11.

[63] Bd. of Supervisors of James City County v. Rowe, 216 Va. 128, 141 (1976); *see also* Bd. of Supervisors of Fairfax County v. Snell Construction Co., 214 Va. 655, 658-59 (1974) (Under certain circumstances, local governments may need to provide evidence that justifies a change in a zoning ordinance even though the ordinance's reasonableness has not been challenged. Courts hold localities to this different standard when "piecemeal"

zoning is found. Several factors suggest piecemeal zoning: (1) initiation of rezoning on the zoning authority's own motion, (2) selectively rezoning a single parcel, and (3) downzoning a parcel to an extent not specified in the comprehensive plan.).

[64] City Council of Salem v. Wendy's of Western Va., 252 Va. 12, 15 (1996) (The reasonableness of a regulation is "fairly debatable" when "the evidence offered in support of the opposing views would lead objective and reasonable persons to reach different conclusions.").

[65] *See* Turner v. Bd. of Supervisors of Prince William County, 263 Va. 283, 295 (2002).

[66] *See* Seabrooke Partners v. City of Chesapeake, 240 Va. 102, 107 (1990); *see also* Gove v. Zoning Bd. of Appeals of Chatham, 444 Mass. 755 (2005) (Although Massachusetts courts may take a more permissive view of land-use regulations, *Gove* provides a useful list of the type of evidence used to justify floodplain regulations. The County of Chatham, Massachusetts survived a takings challenge to a downzoning that severely restricted development in coastal areas experiencing increased flooding by showing that the amendments were necessary to protect public safety. The county offered evidence that the increased flooding endangered residents, rescue workers and adjacent property owners. The county also demonstrated that restricting development would help the county conserve scarce disaster response resources in the future.); *cf.* Bd. of Supervisors of Fairfax County v. Robertson, 266 Va. 525 at 534-537 (2003) (The court held that the county's projections of future noise levels rendered its decision to deny a rezoning reasonable. The landowner used expert testimony to question the testing method used by county experts. The court explained that the case would not be adjudicated as a battle of expert opinions; providing any evidence that could lead a person to agree with the county's conclusion (i.e., the projections) was sufficient.); Rathkopf's Law of Zoning and Planning § 38:13 (4th ed. 2010) ("The probable validity of a comprehensive downzoning is further enhanced if it is the result of systematic study and planning, whereby the local government can point to such factors as newly discovered environmental hazards…").

[67] Rolling easements are not explicitly provided for in the Virginia Code. However, per our discussion *infra* Part III.E.4., localities may have sufficient legal authority to implement a voluntary acquisition program.

[68] Before using these specific tools, local governments will need to amend zoning ordinances, including the specific provisions in the ordinance addressing setbacks, tax incentives and Transfer Development Rights programs (if any), to incorporate considerations of sea-level rise.

[69] In Virginia the shoreline is typically measured by reference to the mean low water line, discussed *infra* note 95.

[70] *See supra* Part III.A.

[71] When instituting setbacks, local governments should be careful to ensure that the boundary line is not set in a manner that entirely prohibits economic development of the property. Such a regulation could be challenged as a "regulatory taking" requiring compensation under the Fifth Amendment to the United States Constitution. *See generally* Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

[72] 9 Va. Admin. Code § 10-20-80(B)(5) (enumerating criteria required by Va. Code Ann. § 10.1-2107).

[73] Va. Code Ann. § 10.1-2107(B).

[74] *Id.* § 15.2-2316.1.

[75] *Id.* § 15.2-2316.2(A) ("Pursuant to the provisions of this article, the governing body of any locality by ordinance may, in order to promote the public health, safety and general welfare, establish procedures, methods and standards for the transfer of development rights within its jurisdiction. . .").

[76] *Id.* § 15.2-2316.1.

[77] *Id.* § 15.2-2316.2(B)(1)-(4).

[78] *Id.* § 15.2-2316.2(B)(2).

[79] Although the Virginia Code allows local governments to implement TDR programs, very few jurisdictions have actually exercised this authority. The TDR statute as enacted in 2006 had obstacles preventing local governments from implementing TDR programs. For example, the original legislation required that severance of the development right from the sending parcel occur simultaneously with attachment to a receiving parcel. Model TDR Ordinance Work Group, *A Model Transfer Development Rights Ordinance for Virginia Localities*, (Jan. 2010). This obstacle was subsequently removed by amendment in 2009; however, it is unclear whether these amendments will make TDR programs more attractive to local governments. *Id.*; *see also* 2009 Va. Acts ch. 413.

[80] Owners of burdened properties may also receive some financial compensation by using restricted property for agricultural and forestry purposes, where appropriate. Va. Code Ann. § 15.2-2316(B)(8).

[81] *Id.* § 58.1-3230 *et seq.*

[82] *See also* discussion of open space easements *infra* Part III.E.4.iii.

[83] Va. Code Ann. § 58.1-3230.

[84] Wetlands are defined as "an area that is inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, and that is subject to a perpetual easement permitting inundation by water." *Id*. § 58.1-3666.

[85] Riparian buffers are defined as: "area[s] of trees, shrubs or other vegetation, subject to a perpetual easement permitting inundation by water, that is (i) at least thirty-five feet in width, (ii) adjacent to a body of water, and (iii) managed to maintain the integrity of stream channels and shorelines and reduce the effects of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals." *Id*. § 58.1-3666.

[86] *Id.* ("Wetlands…and riparian buffers…that are subject to a perpetual easement permitting inundation by water, are hereby declared to be a separate class of property and shall constitute a classification for local taxation separate from other classifications of real property. The governing body of any county, city or town may…*exempt or partially exempt such property from local taxation*.") (emphasis added).

[87] *Id.*

[88] Specifically, Virginia Code Section 15.2-2286(11) provides:

> A zoning ordinance may include, among other things, reasonable regulations and provisions . . . [f]or [sic] allowing the locality to enter into a voluntary agreement with a landowner that would result in the downzoning of the landowner's undeveloped or underdeveloped property in exchange for a *tax credit* equal to the amount of excess real estate taxes that the landowner has paid due to the higher zoning classification. The locality may establish reasonable guidelines for determining the amount of excess real estate tax collected and the method and duration for applying the tax credit.

[89] *Id.* § 15.2-2316.2(C)(3) ("[A] locality may provide in its ordinance for: (3) The owner of such development rights to make application to the locality for a real estate tax abatement for a period of 25 years, to compensate the owner of such development rights for the fair market value of all or part of the development rights, which shall retire the number of development rights equal to the amount of the tax abatement, and such abatement is transferrable with the property.").

[90] For purposes of this study we have focused on a rolling easement policy that could be implemented by Virginia's local governments using existing statutory authorities, such as the Open Space Land Act (discussed below). Therefore, this study only analyzes a rolling easement policy using recordable instruments to limit development on property. However, a rolling easement policy could take other forms. Some states have statutes that create public "rolling easements" through: prohibitions of coastal armoring, such as Maine's Coastal Sand Dunes Rule, Code Me. R. ch. 355, § 3(B)(1) (1993), or requirements that structures encroaching on public lands be removed,

such as the Texas Open Beaches Act. Tex. Nat. Res. Code Ann. §§ 61.001 to 61.178 (West 1978 & Supp. 1998); *see generally* 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, 1368-79. These statutes are broadly effective because they automatically create rolling easements to protect public lands and do not require any recorded instrument. In order to implement this type of policy in Virginia, however, the General Assembly would need to enact specific legislation.

Additionally, the same functions of a rolling easement (described above) could be exacted through conditions in a development or subdivision permit. However, this method would be limited to voluntary exactions or may require a legislative amendment because the Code prohibits localities from exacting "mandatory dedication[s] of real or personal property for open space." Va. Code Ann. § 15.2-2297(a)(iv); *see also* Titus, 57 Md. L. Rev. at 1339-1342 (1998); Meg Caldwell, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 Ecology L.Q. 533, 564-66 (2007).

[91] Va. Code Ann. § 15.2-1800; *see* discussion of Open Space Lands Act *infra* Part E.4.iii.

[92] The Texas Supreme Court first used the term "rolling easement" when it upheld a Texas statute (the Texas Open Beaches Act) requiring removal of structures that encroached on public lands after a hurricane eroded the beach. *See* Feinman v. State, 717 S.W. 2d 106 (Tex. App. 1986); *see also* Titus, *supra* note 90, at 1364-68 (1998).

[93] *See* Titus, *supra* note 90, at 1364-68.

[94] *Id*. The state is said to hold these lands in trust for the benefit of the citizens of the state. Va. Const. Art. XI, §§ 1- 2; *see also* Palmer v. Virginia Marine Res. Comm'n, 48 Va. App. 78, 88 (2006) ("[T]he state holds the land lying beneath public waters as trustee for the benefit of all citizens. As trustee, the state is responsible for proper management of the resource to ensure the preservation and protection of all appropriate current and potential future uses, including potentially conflicting uses, by the public.").

[95] The MLWL boundary is measured using "the average elevation of low water observed over a specific 19 year period." *Palmer,* 48 Va. App. at 88*.* (citing William L. Roberts, *Coastal Resources and the Permit Process: Definitions and Jurisdictions*, 6-7, http://ccrm.vims.edu/wetlands/techreps/CoastalResourcesandPermitProcess.pdf). Virginia is only one of five states that use the mean low water line (MLWL) to demarcate public trust lands. In MLWL states the public only owns the wet beach. However, the state still retains an easement over the tidelands (the areas between the MLWL and the mean high tide line) but only for the limited purposes of hunting, fishing, and navigation. In most states the public owns the dry beach up to the mean high tide line. *Id.; see also* Titus, *supra* note 90, at 1293. Public trust lands in Virginia are called "bottomlands" or "subaqueous lands." Va. Code Ann. § 28.2-1200.

[96] Rolling easements could also be donated. This type of voluntary program, however, has significant limitations. The easement would only bind the agreeing property owner and any successors. In the event the entire burdened property becomes inundated, the next inland parcel would not be bound by the easement (unlike public easements created by statutes like the Texas Open Beaches Act). Rolling easements would need to be separately negotiated and acquired from any upland parcels also vulnerable to sea-level rise.

[97] Instead of using the MLWL as a baseline, theoretically the easement terms could also build in a buffer (i.e., specify a distance inland from the MLWL where development is prohibited). Because a rolling easement would be a voluntary exchange between the property owner and the government, the government would not be limited to merely protect public trust interests. By building in a buffer, local governments could build in stronger protections against property damage and emergency response costs caused by storm surge.

[98] *See* Titus, *supra* note 90, at 1377-78; *see also* Caldwell, *supra* note 90, at 550-51.

[99] *See* Titus, *supra* note 90, at 1332.

[100] Rolling easements could be structured in several ways: (1) a conditional reversionary interest in land, such as a possibility of reverter, (2) a negative in gross easement (i.e., an open space or conservation easement), (3) a negative easement held by the state as the adjacent land owner under the public trust doctrine, (4) a positive easement held by the state as the adjacent land owner. Each of these approaches have different limitations. This study focuses on creation of rolling open space easements because we are examining local authorities. Options 3 and 4 would best be implemented at a state level because the state is the adjacent landowner under the public trust doctrine.

[101] Tardy v. Creasy, 81 Va. 553 at *2 (1886) ("the law will not permit a land-owner to create easements of every novel character and attach them to the soil").

[102] *Id.*

[103] Only certain easements were recognized at common law, including affirmative appurtenant easements and certain limited negative easements. *Id*. Easements are either appurtenant (i.e., benefitting a particular adjacent parcel) or in gross (i.e., a personal easement benefiting an individual). United States v. Blackman, 270 Va. 68, 77 (2005). Easements are also either affirmative or negative. Affirmative easements grant the holder rights to use the burdened property for specified purposes. *See id.* at 76-78. Negative easements, also known as servitudes, grant the easement holder a legal right to object to use of the property. *Id.* at 76. Only four negative easements were recognized at common law including easements for light, air, support or the flow of artificial streams. Frederico Cheever, *Public Good and Private Magic in the Law of Land Trusts and Conservation Easements: A Happy Present and a Troubled Future,* 73 Denv. U. L. Rev. 1077, 1081 (1996). At common law, in gross easements were disfavored because they were seen to interfere with the free use of land and, therefore, in gross easements could not be transferred. *Blackman*, 270 Va. at 77. Negative in gross easements were not recognized at common law. Cheever, 73 Denv. U. L. Rev. at 1080-81.

[104] These statutes simply authorize local governments to acquire property interests that are *currently recognized* under Virginia law, such as acquisition of the entirety of a property in fee simple or acquisition of utility easements across property. As described above, the Virginia Supreme Court has struck down local ordinances in which local governments implied new powers from a broad delegation. *See supra* Part II.B.4.i.

[105] Va. Code Ann. §§ 15.2-734 (empowering counties) & 15.2-1800 (empowering local governments) (emphasis added).

[106] Any "public body" may hold open space easements and public body is defined as any entity having authority to acquire land for public use, including state agencies, counties and municipalities. *See id*. § 10.1-1700.

[107] *Id.*

[108] *Id.* § 10.1-1700 *et seq*. Starting in the 1950's states began adopting enabling statutes to allow for the creation of conservation easements and open space easements (collectively "open space easements"). Conservation easements are negative easements that can be held in gross by the state (or other entities, such as private land trusts) to preserve property for conservation purposes. Virginia enacted enabling statutes in the 1980's. The Virginia Open Space Land Act, Va. Code Ann. § 10.1-1701 *et seq.*, authorizes public bodies (including state agencies, counties and municipalities), and the Virginia Conservation Easement Act, Va. Code Ann. § 10.1-1009 *et seq*., authorizes charitable associations to hold conservation easements to preserve property for natural and open-space values.

[109] Rolling easements created in this manner could be challenged using the Dillon Rule. Strictly speaking, a rolling easement would not "preserve" or "retain" property in its natural state because it would be used to facilitate limited development on the upland portion of the property. *See id*. § 10.1-1700. However, this seems an overly strict interpretation of the Act. Rolling easements are consistent with the broad purposes of the OSLA because they preserve public trust lands and balance private and public interests in valuable coastal resources.

[110] 270 Va. 68 (2005).

[111] *See supra* note 108.

[112] *Id.* at 75.

[113] *Id.* at 79.

[114] *Id.* at 80.

[115] *Id.* at 79.

[116] *Id.* at 81.

[117] Va. Code Ann § 10.1-1700.