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# The Creation of a Virginia Coastal Resilience Development Authority:

## An Inventory of State Coastal Resilience Authorities and Funding Mechanisms to Help Guide Virginia



Kristi Gennette, J.D. 2019  
Virginia Coastal Policy Center  
William & Mary Law School



Spring 2019

## About the Author



Kristi Gennette is a native of Charleston, West Virginia and graduated from Washington and Lee University in 2016 with a B.A. in English and Geology. She received her J.D. from William & Mary Law School in May 2019 and was a student in the Fall 2018 Practicum I and Spring 2019 Practicum II. She plans to pursue a career in environmental policy in Washington, D.C.

Thank you to Karly Newcomb (J.D. Candidate 2021) for assistance with additional research and citation checking for this paper.

## About the Virginia Coastal Policy Center

The Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, by offering education and advice to a host of Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

With two nationally prominent science partners – the Virginia Institute of Marine Science and Virginia Sea Grant – VCPC works with scientists, local and state political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. VCPC activities are inherently interdisciplinary, drawing on scientific, economic, public policy, sociological, and other expertise from within the University and across the country. With access to internationally recognized scientists at VIMS, to Sea Grant's national network of legal and science scholars, and to elected and appointed officials across the nation, VCPC engages in a host of information exchanges and collaborative partnerships.

### CONTACT US

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if you have comments,  
questions, or suggestions.

VCPC grounds its pedagogical goals in the law school's philosophy of the citizen lawyer. VCPC students' highly diverse interactions beyond the borders of the legal community provide the framework for their efforts in solving the complex coastal resource management issues that currently face Virginia and the nation.

VCPC is especially grateful to the Virginia Environmental Endowment for providing generous funding to support out work as well as to establish the clinic in 2012.

## I. INTRODUCTION

In June 2018, Governor Ralph Northam signed legislation creating a cabinet-level position, the Special Assistant to the Governor for Coastal Adaptation and Protection, to lead efforts in addressing coastal resilience and flooding mitigation in Virginia.<sup>1</sup> The following November, Governor Northam signed Executive Order No. 24, which directed the state to increase statewide resilience to natural hazards and extreme weather. This Executive Order directed Virginia to develop a Coastal Resilience Master Plan (CRMP). In order to implement the projects proposed in the CRMP, the Commonwealth will need funding.<sup>2</sup> This paper provides an inventory of various states' programs for funding coastal resilience efforts and sets forth recommendations for Virginia. Before analyzing other states' funding mechanisms, it would be helpful to identify the most popular sources for funding. Some of these options include federal grants,<sup>3</sup> funding for United States Army Corps of Engineers (USACE) resilience projects,<sup>4</sup> utility taxes,<sup>5</sup> special taxing districts,<sup>6</sup> municipal bonds,<sup>7</sup> environmental impact bonds,<sup>8</sup> catastrophe bonds,<sup>9</sup> credit trading

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<sup>1</sup> The Virginia Coastal Policy Center would like to thank Neal Barber, President, Community Futures, for his input and guidance during the development of this student white paper.

<sup>2</sup> For the purposes of this paper the words “financing” and “funding” will be used interchangeably. To “fund” is to “provide with money for a particular purpose.” And to “finance” is defined as to “provide funding for (a person or enterprise).” *Oxford English Dictionary*, <https://en.oxforddictionaries.com/>.

<sup>3</sup> For example, Texas received funding from HUD through its Community Development Block Grant Program. See Press Release, Off. of the Tex. Governor, Texas Receives \$5 Billion Grant from Department of Housing and Urban Development for Disaster Recovery (Apr. 10, 2018), <https://gov.texas.gov/news/post/texas-receives-5-billion-grant-from-department-of-housing-and-urban-development-for-disaster-recovery>.

<sup>4</sup> Texas has partnered with the USACE to conduct studies that will assess coastal vulnerabilities and solutions. See U.S. ARMY CORPS OF ENG'RS, COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY (2018), [https://www.swg.usace.army.mil/Portals/26/docs/Planning/Public%20Notices-Civil%20Works/Coastal-TX%20DIFR-EIS/Coastal%20Texas%20DIFR-EIS\\_Oct2018.pdf?ver=2018-10-24-162409-300](https://www.swg.usace.army.mil/Portals/26/docs/Planning/Public%20Notices-Civil%20Works/Coastal-TX%20DIFR-EIS/Coastal%20Texas%20DIFR-EIS_Oct2018.pdf?ver=2018-10-24-162409-300).

<sup>5</sup> *Resilient Rhody* explains the concept of stormwater utility, and § 58.1-3814 is the section of the Code of Virginia that authorizes the use of utility taxes. See ST. OF R.I. CLIMATE CHANGE, *Rhode Island Statewide Climate Resilience Action Strategy* 73 (2018), <http://climatechange.ri.gov/documents/resilientrhody18.pdf>; see generally VA. CODE ANN. § 58.1-3814 (2012).

<sup>6</sup> *Resilient Rhody* explains the concept of a special taxing district, and § 21-119 is the section in the Code of Virginia that authorizes the use of special taxing districts. See ST. OF R.I. CLIMATE CHANGE, *supra* note 5; see generally VA. CODE ANN. § 21-119 (2017).

<sup>7</sup> The Rhode Island Infrastructure Bank issues municipal bonds. See *Municipal Road and Bridge Revolving Fund, Program Basics*, R.I. INFRASTRUCTURE BANK, <https://www.riib.org/mrbrf>, (last visited June 6, 2019).

<sup>8</sup> Environmental Impact Bonds have been used in DC. See Water Infrastructure and Resiliency Finance Center, *DC Water's Environmental Impact Bond*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/waterfinancecenter/dc-waters-environmental-impact-bond> (last visited June 6, 2019).

<sup>9</sup> *Resilient Rhody* provides an explanation of a catastrophe bond. See ST. OF R.I. CLIMATE CHANGE, *supra* note 5.

markets,<sup>10</sup> private foundation grants,<sup>11</sup> private investments,<sup>12</sup> and tax exemptions.<sup>13</sup>

## II. LOUISIANA

Louisiana, the first state to develop a coastal resilience authority,<sup>14</sup> created the Coastal Protection and Restoration Authority (CPRA) in 2005 at the request of the federal government.<sup>15</sup> After Hurricane Katrina, the federal government was reluctant to give Louisiana federal disaster relief funds that would be distributed to different state agencies.<sup>16</sup> Therefore, the federal government directed Louisiana to create “one central authority that would represent the state and be accountable for all activities and funds” relating to coastal issues.<sup>17</sup> This authority was also charged with developing “a coordinated plan of action with clear goals and achievable objectives.”<sup>18</sup> Louisiana fulfilled the federal government’s requests through restructuring the State’s Wetland Conservation and Restoration Authority to form the CPRA.<sup>19</sup> At that time, the Louisiana Legislature expanded the responsibilities of the Authority and directed it to create a Coastal Master Plan.<sup>20</sup> The first Master Plan was developed in 2007, and subsequently updated in 2012 and 2017.<sup>21</sup> Under LA. STAT. ANN. § 49:214.5.3, the CPRA is required to develop a new Master Plan every six years, and the next Master Plan should be issued in 2023.<sup>22</sup>

The CPRA oversees the implementation of projects outlined in the Master Plan.<sup>23</sup> If a project is not set out in the Master Plan, or found to be inconsistent with the Plan, then the state is

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<sup>10</sup> See e.g., Bruce Ho, *The Regional Greenhouse Initiative Is a Model for the Nation*, NAT’L RES. DEF. COUNCIL (June 12, 2018), <https://www.nrdc.org/resources/regional-greenhouse-gas-initiative-model-nation> (providing an example of a credit trading market that has been used to fund resilience projects).

<sup>11</sup> See e.g., *Faced with Threats from Climate Change, Four Florida Counties work Together to Reduce Risks*, THE KRESGE FOUNDATION (July 11, 2013), <https://kresge.org/news/faced-threats-climate-change-four-florida-counties-work-together-reduce-risks>.

<sup>12</sup> The DC Green Bank intends to gain capital through private investments. See generally, *DC Green Bank*, D.C. DEP’T OF ENERGY & ENV’T, <https://doee.dc.gov/greenbank> (last visited June 6, 2019).

<sup>13</sup> See e.g., Lisa Graichen, NH Policy Updates Support Coastal Resilience, N.H. COASTAL ADAPTATION WORKGROUP (Aug. 25, 2017), <https://www.nhcaw.org/nh-policy-updates-support-coastal-resilience/>.

<sup>14</sup> Resilience has a slightly different meaning in each state. Louisiana’s coastal resilience authority focuses on responding “to continued land loss and increasing flood risk.” *Louisiana’s Comprehensive Master Plan for a Sustainable Coast*, COASTAL PROT. AND RESTORATION AUTH. OF LA. (2017), [http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan\\_Web-Single-Page\\_CFinal-with-Effective-Date-06092017.pdf](http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan_Web-Single-Page_CFinal-with-Effective-Date-06092017.pdf).

<sup>15</sup> *About CPRA: Structure*, COASTAL PROT. AND RESTORATION AUTH. OF LA., <http://coastal.la.gov/about/structure/> (last visited June 6, 2019).

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> Act 8 of the First Extraordinary Session of 2005 “expanded the membership, duties and responsibilities of the board and charged the new Authority with developing and implementing a coastal protection plan.” *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> Telephone Interview with Charles Sutcliffe, Dir. of Pol’y and Programs, Off. of the Governor: Coastal Activities (Mar. 13, 2019).

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

unable to fund it.<sup>24</sup> Initially this helped to keep politics out of the process; however, after 12 years, legislators have learned how the funding system works and politics has begun to creep back into resilience funding decisions.<sup>25</sup> While this is a potential medium- to long-term risk of creating a coastal authority, the overall benefit of having a rigorous and thoughtful process – and working to keep and maintain that process – is important.<sup>26</sup>

The most recent Master Plan included 120 projects, which are to be funded from multiple sources including the Deepwater Horizon Oil settlement,<sup>27</sup> the Gulf of Mexico Energy and Security Act (GOMESA),<sup>28</sup> the Coastal Protection and Restoration Trust Fund,<sup>29</sup> the Coastal Wetlands Planning, Protection, and Restoration Act Program,<sup>30</sup> the Water Resource Development Act/Energy & Water Appropriation Act,<sup>31</sup> State Capital Outlay funds,<sup>32</sup> disaster-based funding, and grants from various entities.<sup>33</sup> The state has also created, by legislation, the Coastal Protection and Restoration Financing Corporation, which is a quasi-state entity that was established to create bonds for coastal revenue streams.<sup>34</sup> It was established by legislation, but has not yet been used to execute the bonding of any coastal revenue streams.<sup>35</sup>

The creation of an Authority has been helpful to Louisiana’s resilience efforts because it streamlines coordination between multiple relevant state agencies as well as regional representatives.<sup>36</sup> The Authority speaks with one voice, and stakeholders know how the system works and the process by which to get something accomplished.<sup>37</sup> The major players are also housed in the same building, which increases efficiency.<sup>38</sup> An effective Master Plan and an accountable Authority that oversees its implementation allow people to feel confident dedicating money to the Authority.<sup>39</sup> The Authority also gains credibility through its work with the Water Institute of the Gulf, a local scientific organization.<sup>40</sup> The Water Institute of the Gulf is an independent organization dedicated to the applied sciences that operates an entity somewhere

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<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> These funds are administered under the RESTORE Act, National Fish and Wildlife Foundation, and the Oil Pollution Act (NRDA). *Louisiana’s Comprehensive Master Plan for a Sustainable Coast*, *supra* note 14, at 128-31 (last visited June 6, 2019).

<sup>28</sup> Louisiana, along with other Gulf States that permit outer continental shelf exploration, receive 37.5% of all qualified outer continental shelf revenues. *Id.* at 131.

<sup>29</sup> State fund that “is largely supported by mineral revenues and severance taxes on oil and gas production on state lands.” *Id.*

<sup>30</sup> Funded via “a 13.07% share of Sport Fish Restoration and Boating Trust Fund revenues.” *Id.* at 131.

<sup>31</sup> Dependent on “projects being approved by USACE, [] the availability of federal funds, and [] political support.” *Id.* at 132.

<sup>32</sup> Cash and non-cash lines of credit to supplement project implementation. *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> Telephone Interview with Charles Sutcliffe, *supra* note 21.

<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

between that of a university and a consulting firm.<sup>41</sup> The state frequently cites to this organization to demonstrate that Louisiana’s policy decisions are supported by an independent, scientific source.<sup>42</sup>

However, the creation of an authority also comes with some challenges.<sup>43</sup> There is more of a learning curve in creating an authority, and it takes time and effort to transition into the use of a new authority.<sup>44</sup> States have a number of alternatives to creating a new authority altogether. For example, in 2018, Louisiana chose to improve its floodplain management efforts through the creation of a Council on Watershed Management.<sup>45</sup> The Council is composed of the Office of Community Development, CPRA, Governor’s Office of Homeland Security and Emergency Preparedness, Department of Transportation and Development, and the Department of Wildlife and Fisheries.<sup>46</sup> These agencies are to cooperate in developing a plan to improve floodplain management.<sup>47</sup> Rather than establishing a new authority to deal with floodplain management, the Governor chose to create a Council of coordinated agencies – increasing collaboration among agencies with related missions to reduce flood risk.<sup>48</sup>

**Takeaway:** Louisiana is the only state that has a single authority that administers and funds its coastal resilience programs. Every other state coordinates its coastal resilience efforts through cooperation between various agencies and funding authorities.

Louisiana has benefited greatly from the creation of a coastal resilience authority, and it has been a key point of governance driving hurricane and oil spill recovery processes.<sup>49</sup> A single authority is helpful because it can fund local governments, commercial businesses, and homeowners.<sup>50</sup> Funding may not be as streamlined in states that use different authorities to fund those sectors.<sup>51</sup> Louisiana’s authority is more efficient because all of the financing options are administered by the same entity.<sup>52</sup>

Additionally, a single authority is helpful in terms of planning.<sup>53</sup> A centralized authority allows the state to speak authoritatively and conclusively on its coastal resilience policies. It also

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<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *About*, LA. WATERSHED INITIATIVE, <https://watershed.la.gov/about> (Last visited June 6, 2019).

<sup>47</sup> *Id.*

<sup>48</sup> *See id.*

<sup>49</sup> Telephone Interview with Charles Sutcliffe, *supra* note 21.

<sup>50</sup> *Id.*

<sup>51</sup> *See id.*

<sup>52</sup> *Id.* Because the Coastal Protection and Restoration Financing Corporation has not yet been utilized, its “exact role and powers are not fully clear.” PUB. AFFAIRS RES. COUNCIL OF LA., CHAPTER TWO: THE CPRA, THE MASTER PLAN AND THE COASTAL FUND, THE NEW LOUISIANA PURCHASE (2016), <http://reports.parlouisiana.org/2016/CoastalPrimer/chapter2.html>.

<sup>53</sup> Telephone Interview with Charles Sutcliffe, *supra* note 21.

provides clarity to stakeholders.<sup>54</sup> Planning efforts are transparent because it is obvious who is in charge and what they seek to accomplish.<sup>55</sup> Those coordinating planning efforts also benefit from this structure because they are housed in the same building and can cooperate more easily.<sup>56</sup>

However, there are disadvantages to creating one centralized authority. Because leadership on the issue is centralized to one entity, staffing decisions are extremely important in order to ensure competent and effective leaders are in place.<sup>57</sup> In addition, having one authority that funds local governments, commercial businesses, and homeowners prevents specialization and expertise.<sup>58</sup> There are different types of programs to finance, and some would argue that different professionals should administer each type of program.<sup>59</sup> Finally, there can be administrative delays in creating an authority.<sup>60</sup> It takes time to set up a new authority, train people to work at that authority or work together in new ways, and inform the public of this change.<sup>61</sup>

### III. RHODE ISLAND

In 2014, Governor Chafee signed Executive Order 14-01, which created the Rhode Island Executive Climate Change Council (the “Council”).<sup>62</sup> The Executive Order directs the Council to coordinate state agencies’ efforts to respond to the adverse effects of climate change.<sup>63</sup> The Council includes the state directors of Administration, Coastal Resources Management, Commerce, Emergency Management, Energy Resources, Environmental Management, Health, Planning, and Transportation.<sup>64</sup> Then, in 2017, Governor Raimondo signed Executive Order 17-10, which created the position of State Chief Resilience Officer.<sup>65</sup> The Executive Order directed the Chief Resilience Officer to collaborate with the Council to create a statewide action plan by July 1, 2018.<sup>66</sup> The Executive Order also emphasized that Rhode Island is particularly vulnerable to the effects of climate change due to its 400 miles of coastline, and called for the action plan to prioritize coastal resilience.<sup>67</sup> Rhode Island’s action plan defines resilience as “the capacity of individuals, institutions, businesses, and natural systems within Rhode Island to survive, adapt, and grow no matter what chronic stresses and weather events they experience.”<sup>68</sup>

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<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> Telephone Interview with Shawn Crumlish, Dir. of Fin. Serv., Va. Res. Auth. (Mar. 15, 2019).

<sup>59</sup> *Id.*

<sup>60</sup> Telephone Interview with Charles Sutcliffe, *supra* note 21.

<sup>61</sup> *Id.*

<sup>62</sup> R.I. Exec. Order No. 14-01 (2014), <http://theicnet.org/wp-content/uploads/2015/07/2014-03-RI-Executive-Order-CC-2014.pdf>.

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> R.I. Exec. Order No. 17-10 (2017), <http://www.governor.ri.gov/documents/orders/ExecOrder-17-10-09152017.pdf>.

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *See* ST. OF R.I. CLIMATE CHANGE, *supra* note 5, at 6.



In July 2018, Rhode Island released its action plan, titled “Resilient Rhody: An Actionable Vision for Addressing the Impacts of Climate Change in Rhode Island”.<sup>69</sup> Resilient Rhody is divided into six chapters: “Rhode Island’s Changing Climate,” “Critical Infrastructure and Utilities,” “Natural Systems,” “Emergency Preparedness,” “Community Health and Resilience,” and “Financing Climate Resilience Projects.”<sup>70</sup> Resilient Rhody is largely an aspirational document and typically sets forth general goals rather than specific projects.<sup>71</sup> However, perhaps because the Action Plan seeks to coordinate existing agencies rather than to create a new authority, it spends a considerable amount of time detailing agency projects already in progress that could be improved.<sup>72</sup>

The final chapter in Resilient Rhody discusses funding mechanisms.<sup>73</sup> Resilient Rhody is one of the only master plans that fully acknowledges the difficulties associated with financing resilience projects.<sup>74</sup> Resilient Rhody sets forth five “[b]arriers to paying for climate resilience projects” before it discusses any potential solutions.<sup>75</sup>

- 1) The first barrier set forth is “[d]ifficulty obtaining grant funding.”<sup>76</sup> Resilient Rhody points out that grant funding is often not enough to cover a specific project.<sup>77</sup> Further, obtaining a federal or local grant is challenging for state and local governments because the grants are often confusing or difficult to comply with.<sup>78</sup>
- 2) The second barrier that Resilient Rhody acknowledges is that local governments often have “[m]isaligned incentives.”<sup>79</sup> For example, a municipality has an incentive to protect its constituents from the effects of climate change, but it also has an incentive to develop areas that are particularly vulnerable to coastal hazards.<sup>80</sup> Also, “the return-on-investment timeline” is not certain for most resiliency projects, which makes it more difficult for local governments to align their incentives.<sup>81</sup>
- 3) The third barrier is that there is a “[l]ack of sustainable revenue streams” for resiliency projects, which “makes it difficult for entities to repay costs associated

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<sup>69</sup> *Id.*

<sup>70</sup> *Id.* at 5.

<sup>71</sup> *Id.* at 6.

<sup>72</sup> *See id.*

<sup>73</sup> *Id.* at 68-75.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.* at 69-70.

<sup>76</sup> *Id.* at 69.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*

<sup>81</sup> *Id.* at 69-70.

with completing these projects.”<sup>82</sup> Furthermore, the benefits of resilience projects are often difficult to monetize, which exacerbates the problem.<sup>83</sup>

- 4) The fourth barrier is that local governments often lack upfront capital, which prevents entities from completing resilience projects or from accepting grants for which they would otherwise be eligible.<sup>84</sup>
- 5) Finally, Resilient Rhody acknowledges that local governments often possess a “[l]imited ability to borrow funds,” and that “the nature of resilience projects creates additional difficulty for the entity issuing debt because of the lack of a sustainable revenue stream connected with the project.”<sup>85</sup>

The barriers to financing resiliency projects set forth in Resilient Rhody likely apply with as much weight to other states, and these barriers are helpful to keep in mind when analyzing potential funding sources.<sup>86</sup>

Because Resilient Rhody is less than a year old, many of the potential financing mechanisms set forth in the plan have not yet been implemented; however, they provide ideas that could potentially work in other states.<sup>87</sup> Resilient Rhody also provides helpful explanations of various financing concepts.<sup>88</sup> The first mechanism set forth is an “Environmental Impact Bond.”<sup>89</sup> An Environmental Impact Bond would allow “an entity to shift project performance risk to a private party and tie borrowing costs to the actual effectiveness of the project.”<sup>90</sup> Environmental Impact Bonds have been utilized as a funding mechanism in other localities and could be employed in a variety of resilience efforts.<sup>91</sup>

Second, a “Stormwater Utility/Stormwater Accelerator” is a financing mechanism that would allow borrowers to obtain upfront capital to complete resilience projects more quickly.<sup>92</sup> A stormwater utility would operate like other utilities and would be able to create “a revenue stream that can be used to sustainably provide funding for stormwater projects or can be leveraged by issuing debt.”<sup>93</sup>

Third, a “Resilience Zone” involves “the creation of an overlay district” in a particularly vulnerable area “coupled with a special assessment or voluntary fee paid by property owners

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<sup>82</sup> *Id.* at 70.

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> *Id.*

<sup>86</sup> *See id.* at 69-70.

<sup>87</sup> *See id.* at 71-75.

<sup>88</sup> *Id.*

<sup>89</sup> *Id.* at 72.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.* at 75-76.

<sup>92</sup> *Id.* at 73.

<sup>93</sup> *Id.*

within the district.”<sup>94</sup> This would appeal to those paying the fee because the fee would be used to complete projects that directly benefit them.<sup>95</sup>

Fourth, a “Resilience Bond” is a mechanism similar to a “Catastrophe Bond except that a portion of the bond proceeds would be used to invest in projects that reduce the likelihood of the triggering event occurring.”<sup>96</sup> This benefits the issuer because he receives the benefit of mitigation projects, while also benefitting the investors “who see a reduced risk of the triggering event occurring.”<sup>97</sup>

Fifth, “Property Assessed Resilience” is a financing mechanism “that would take advantage of anticipated reductions in insurance costs that would result from resilience upgrades to provide a revenue stream for repayment of the loan.”<sup>98</sup>

Finally, Resilient Rhody offers the idea of “Credit Trading Market” as a potential funding mechanism.<sup>99</sup> The Regional Greenhouse Gas Initiative is an example of a credit trading market, and it “involves the purchase and sale of credits that represent a specific type of investment and help entities to meet regulatory requirements in a way other than the direct completion of projects.”<sup>100</sup>

In addition to these innovative funding mechanisms, the Rhode Island Infrastructure Bank plays a key role in financing coastal resilience efforts.<sup>101</sup> The Bank was established by the Rhode Island General Assembly in 1989 and was originally called the Clean Water Finance Authority.<sup>102</sup> Its role was “significantly expanded in 2015 to include energy and brownfield remediation initiatives.”<sup>103</sup> The state’s Chief Resilience Officer, Shaun O’Rourke, is an employee of the bank rather than the state.<sup>104</sup> He frequently works with the Administration and oversees the Council’s resiliency work.<sup>105</sup> Although he is not housed in the same building as the administration, the Rhode Island Infrastructure Bank is located in the same city as the state’s capital, which helps with coordination efforts.<sup>106</sup>

The Rhode Island Infrastructure Bank is notable because although it primarily funds local governments, it has expanded its role to provide financing to homeowners and businesses too.<sup>107</sup>

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<sup>94</sup> *Id.*

<sup>95</sup> *Id.*

<sup>96</sup> *Id.* at 73-74.

<sup>97</sup> *Id.*

<sup>98</sup> *Id.* at 74.

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.* at 75.

<sup>102</sup> *Who We Are*, R.I. INFRASTRUCTURE BANK, <https://www.riib.org/who-we-are> (Last visited June 7, 2019).

<sup>103</sup> *Id.*

<sup>104</sup> Telephone Interview with Shaun O’Rourke, Dir., Stormwater and Resiliency and Chief Resilience Officer, St. of R.I. (April 15, 2019).

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

The Rhode Island Infrastructure Bank should be of particular interest to Virginia because similar entities such as the Virginia Resources Authority (VRA) do not lend to businesses and homeowners.<sup>108</sup> This is an example of a funding source that has successfully expanded to finance resilience projects.<sup>109</sup> Also, the Rhode Island Infrastructure Bank is using existing programs in creative ways.<sup>110</sup> The Bank takes operating capital it receives from loans and uses it to fund resilience projects.<sup>111</sup> Also, the Bank will ask more specific questions and will try to use multiple programs to fund a particular project to make sure that funding will be used in the most effective way.<sup>112</sup>

**Takeaway:** Although Rhode Island has not created a coastal resilience authority, its model should be helpful to Virginia. Rhode Island appointed a Council and a Chief Resilience Officer to coordinate state agencies' resilience actions.<sup>113</sup> The Council and Chief Resilience Officer allow Rhode Island to speak with one voice on coastal resilience issues, even if its projects are implemented by various state agencies.<sup>114</sup> This is also a helpful setup because there is less of a learning curve.<sup>115</sup> The Council and Chief Resilience Officer work with people who are already employed by agencies and expand existing programs that are already being implemented.<sup>116</sup> This allows Rhode Island to improve its resiliency efforts more quickly while also enjoying the benefits that come with having a central planning organization.<sup>117</sup>

Rhode Island is also working to fund resilience projects in creative ways.<sup>118</sup> Resilient Rhody acknowledges that financing resilience projects is not always easy, and it describes some of Rhode Island's struggles with funding that seem universal to most states' efforts.<sup>119</sup> It also explains some innovative financing ideas that could be helpful to Virginia, even if they have not yet been implemented in Rhode Island.<sup>120</sup>

The Rhode Island Infrastructure Bank funds many of Rhode Island's coastal resilience efforts, and it provides an example of a financing authority that has decided to administer existing programs in creative ways to finance coastal resilience improvements.<sup>121</sup> Although it initially funded mostly local governments, it now funds both commercial businesses and homeowners

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<sup>108</sup> Telephone Interview with Shawn Crumlish, *supra* note 58.

<sup>109</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> See notes 62-67 and accompanying text, *supra*.

<sup>114</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

<sup>115</sup> See *id.*

<sup>116</sup> *Id.*

<sup>117</sup> *Id.*

<sup>118</sup> *Id.*

<sup>119</sup> See notes 74-86 and accompanying text, *supra*.

<sup>120</sup> See notes 88-100 and accompanying text, *supra*.

<sup>121</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

too.<sup>122</sup> The Rhode Island Infrastructure Bank is a helpful model of an existing bank that expanded its traditional role to fund resiliency projects.<sup>123</sup>

#### IV. MASSACHUSETTS

In 2016, Governor Baker signed Executive Order 569, which directed executive agencies to create and implement a climate adaptation plan.<sup>124</sup> The Executive Order directed the Executive Offices of Energy and Environmental Affairs and Public Safety and Security to lead the development and implementation of the Plan.<sup>125</sup> Massachusetts created the State Hazard Mitigation Plan and Climate Adaptation Plan (SHMCAP) in September 2018 in response to Executive Order 569.<sup>126</sup> SHMCAP is meant to respond to “numerous natural hazards,” which “are being exacerbated by rising temperatures, changes in precipitation, extreme weather, and sea level rise.”<sup>127</sup> Additionally, SHMCAP “provides a framework that links pre- and post-disaster mitigation with long-term climate adaptation, resiliency planning, and implementation.”<sup>128</sup> Massachusetts choose not to create a resilience authority.<sup>129</sup> Rather, SHMCAP outlines plans to be implemented within existing executive offices and state agencies.<sup>130</sup>

In order to create SHMCAP, state agencies proposed various resilience projects, and Massachusetts applied a prioritization tool to the projects proposed.<sup>131</sup> The prioritization tool was developed by a consultant team and the Massachusetts State Hazard Mitigation and Climate Adaptation Management Team “using agreed-on metrics.”<sup>132</sup> This tool analyzed each proposed project by considering factors such as the project’s ability to meet specified goals, cost-effectiveness, and environmental soundness.<sup>133</sup> The project was then given a priority level of very high, high, medium, or low.<sup>134</sup> To ensure projects were furthering the Plan’s purpose, each action was also categorized into five different sections.<sup>135</sup>

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<sup>122</sup> *Id.*

<sup>123</sup> *See id.*

<sup>124</sup> Mass. Exec. Order No. 569 (2016), <https://www.mass.gov/executive-orders/no-569-establishing-an-integrated-climate-change-strategy-for-the-commonwealth>.

<sup>125</sup> *Id.*

<sup>126</sup> ST. OF MASS., EXEC. OFF. OF ENERGY & AFF., MASSACHUSETTS STATE HAZARD MITIGATION AND CLIMATE ADAPTATION PLAN, SHMCAP (2018), <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>.

<sup>127</sup> *Id.* at xiii.

<sup>128</sup> *Id.*

<sup>129</sup> *Id.*

<sup>130</sup> *Id.*

<sup>131</sup> *Id.* at 7-8.

<sup>132</sup> *Id.*

<sup>133</sup> *Id.* at 7-2.

<sup>134</sup> *Id.* at 7-8.

<sup>135</sup> *Id.* at 7-2. The goals of the projects in the five sections are to: (1) enhance the Commonwealth’s resiliency to natural hazards and climate change by integrating programs and building institutional capacity, (2) reduce the impacts of natural hazards and climate change with forward-looking policies, plans, and regulations, (3) understand our vulnerabilities and risks and develop immediate and long-term risk reduction strategies for current and future conditions using the best available science, (4) increase the resilience of State and local government, people, natural systems, the built environment, and the economy by investing in performance-based solutions, and (5) support

Massachusetts determined which projects it would prioritize in part through the Municipal Vulnerability Grant Program (MVP).<sup>136</sup> This program flips the traditional procedure for funding projects.<sup>137</sup> Typically, municipalities want to obtain funding first, and will then figure out how to use it.<sup>138</sup> Under the MVP, the state helps municipalities prioritize which projects they would like to fund, and then helps them to obtain funding.<sup>139</sup> Massachusetts identifies potential funding sources for each project in the SHMCAP, and these funding sources range from incorporating the project into the state budget to applying for federal grants.<sup>140</sup> Each project description also identifies the state agency in charge of implementing the project, which would handle funding for that project.<sup>141</sup>

Additionally, Massachusetts set aside an amount of money to improve its resiliency efforts. In August 2018, Governor Baker authorized over \$2.4 billion in bond funding for climate change adaptation, environmental protection, and community investments.<sup>142</sup> Governor Baker directed \$290 million to be used to fund coastal resilience strategies as well as dam and seawall improvements, \$75 million to the Municipal Vulnerability Preparedness Program, \$100 million to implementing the SHMCAP, \$665 million to recreational programs, \$405 million for grant programs for localities, and \$474 million to support environmental programs in various state agencies.<sup>143</sup> These programs are to be funded by the issuance and sale of bonds by the state treasurer which are payable until June 30, 2043.<sup>144</sup>

**Takeaway:** Massachusetts's SHMCAP is an excellent model for Virginia to study. Massachusetts's plan is similar to Resilient Rhody in that it does not create a separate authority to oversee its coastal resilience programs.<sup>145</sup> Instead, it allows existing state agencies to oversee the implementation and financing of coastal resilience projects.<sup>146</sup> The SHMCAP is 554 pages, and it

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implementation of this plan through increased education, awareness, and incentives for action for state agencies, local governments, private industry, non-profits, and the general public.

<sup>136</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

<sup>137</sup> *Id.*

<sup>138</sup> *Id.*

<sup>139</sup> *Id.*

<sup>140</sup> ST. OF MASS., EXEC. OFF. OF ENERGY & AFF., *supra* note 126. Some of the funding options include: state funding (capital budget), state funding (operating budget), state funding (operational and capital budget), FEMA HMA Grant, FEMA Emergency Management Performance Grant, State Management Cost, Earthquake Hazards Reduction State Assistance Program, USGS cooperative funding, NOAA, Fish and Wildlife Service, Natural Resources Conservation Service, the National Fish and Wildlife Foundation, EOEEA's Dam and Seawall Repair or Removal Program, Regional Greenhouse Gas Initiative, MVP action grants, revenue from the Executive Office of Energy and Environmental Affairs, FTA Grants, alternative compliance payments, trust funding, the ongoing regulatory structure, and other federal grants.

<sup>141</sup> *Id.*

<sup>142</sup> Press Release, Off. of the Mass. Governor, Governor Baker Signs Legislation Directing \$2.4 Billion to Climate Change Adaptation, Environmental Protection, and Community Investments (Aug. 21, 2018), <https://www.mass.gov/news/governor-baker-signs-legislation-directing-24-billion-to-climate-change-adaptation>.

<sup>143</sup> *Id.*

<sup>144</sup> *Id.*

<sup>145</sup> See ST. OF MASS., EXEC. OFF. OF ENERGY & AFF., *supra* note 126.

<sup>146</sup> *Id.*

extensively discusses Massachusetts' climate change and natural hazard vulnerabilities and specific projects the state would like to implement to improve its resiliency.<sup>147</sup> Most of the other plans are vague and less transparent.<sup>148</sup> Additionally, Massachusetts is unique because the state has managed to direct significant amounts of money to improve coastal resiliency.<sup>149</sup> Massachusetts is a great example of a state with a new resilience plan that is highly specific and financed through existing agencies and bond funding.<sup>150</sup>

## V. TEXAS

After Hurricane Ike and Hurricane Dolly, the Texas Land Commissioner, George P. Bush, directed the GLO to develop the Texas Coastal Resiliency Master Plan ("Master Plan") "to help coastal communities to become more resilient and less vulnerable to coastal storms and hazards."<sup>151</sup> Texas developed its initial Master Plan in March 2017,<sup>152</sup> and released an updated Master Plan in March 2019.<sup>153</sup> Texas did not create an authority, and it did not create a council composed of different state agency directors to oversee the creation and implementation of its Master Plan.<sup>154</sup> Rather, Texas's Master Plan was created by the Texas General Land Office (GLO), which was already in existence.<sup>155</sup> The Master Plan was developed by a Technical Advisory Committee (TAC).<sup>156</sup> The TAC is made up of more than 200 coastal experts from state and federal agencies, universities, local governments, non-profits, engineering firms, port representatives, and regional trusts, foundations, and partnerships.<sup>157</sup> Although Texas did not designate a new council to spearhead the development of the Master Plan, it still included agency heads in the TAC, which is consistent with the approach taken by most states.<sup>158</sup> The GLO acts in a capacity similar to a coastal resilience authority in that it is the single entity that municipalities look to for funding.<sup>159</sup>

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<sup>147</sup> *Id.*

<sup>148</sup> *See id.*

<sup>149</sup> *See* notes 142-144 and accompanying text, *supra*.

<sup>150</sup> ST. OF MASS., EXEC. OFF. OF ENERGY & AFF., *supra* note 126.

<sup>151</sup> TEX. GEN. LAND OFF., TEXAS COASTAL RESILIENCY MASTER PLAN, EXECUTIVE SUMMARY (2017), <http://www.glo.texas.gov/coastal-grants/projects/files/Executive-Summary.pdf> [hereinafter *Texas Plan 2017*].

<sup>152</sup> Texas received funding for its first Master Plan from the Community Development Block Grant Program (CDBG) and the Coastal Zone Management Program (CMP). The total budget for the project was \$1,690,096. GLO received \$1,031,426 from CDBG and \$309,979 from CMP. CDBG is administered by HUD. The CMP is another source of federal funding for the GLO. This program is funded by NOAA, and it gave Texas some of the federal Coastal Zone Management Act (CZMA) funds. The Coastal Impact Assistance Program (CIAP) also helps to fund the GLO. CIAP is funded by royalties from offshore oil and gas leases on federal property, and these funds were allocated to Texas through the U.S. Fish and Wildlife Service. However, Texas has not received any additional funds from CIAP since 2007.

<sup>153</sup> TEX. GEN. LAND OFF., TEXAS COASTAL RESILIENCY MASTER PLAN (2019) <https://coastalstudy.texas.gov/resources/files/2019-coastal-master-plan.pdf> [hereinafter *Texas Plan 2019*].

<sup>154</sup> *Texas Plan 2017*, *supra* note 151.

<sup>155</sup> *Id.*

<sup>156</sup> *Id.* at 4.

<sup>157</sup> *Id.*

<sup>158</sup> *See id.*

<sup>159</sup> *See id.*

However, this can create delays and frustration for agencies and localities because they have less control over the funding they receive.<sup>160</sup>

The 2019 Master Plan considered 4 coastal regions and 11 types of actions to increase long-term resiliency.<sup>161</sup> To achieve these 11 actions, the 2019 Master Plan identified 123 projects as “Tier 1” projects, which is the category for projects of the highest priority.<sup>162</sup> The Master Plan notes when a project has received partial funding from an identified source; however, many of the Tier 1 projects do not have an identified funding source.<sup>163</sup> The Master Plan also states that it hopes to receive legislative appropriations to help implement the projects listed.<sup>164</sup> Texas struggles to find funding to implement the projects in its Master Plan and has only completed 7 of the 63 Tier 1 projects from the 2017 Master Plan.<sup>165</sup> However, unlike in Louisiana, a project does not need to be set forth in the Master Plan in order to receive funding. Some additional projects that are not set forth in the Master Plan may be completed.<sup>166</sup>

Prior to the development of the Master Plan, the GLO collaborated with local and federal entities on a variety of other planning efforts that look at specific coastal regions or issues. The GLO worked with the Harte Research Institute at Texas A&M Corpus Christi on the Coastal Planning Study in 2012, which “laid the foundation for the development of the . . . Master Plan” by forming a team of coastal experts to identify priority issues facing the coast.<sup>167</sup> Additionally, beginning in 2013, the Gulf Coast Community Protection and Recovery District<sup>168</sup> and GLO conducted a phased Storm Surge Suppression Study for the upper six coastal counties on the coast to recommend flood damage reduction and storm suppression measures.<sup>169</sup> Phase 4 of the Storm Suppression Study, called the “optimization phase”, was completed in late 2018.<sup>170</sup> In 2016, the

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<sup>160</sup> See Rebecca Elliott, *Texas leaders ask that Harvey recovery aid be sent directly to Houston, Harris County*, CHRON (Apr. 12, 2018, 3:03 PM), <https://www.chron.com/news/politics/houston/article/Letter-Send-Harvey-recovery-aid-directly-to-12829015.php>.

<sup>161</sup> *Texas Plan 2019*, *supra* note 153, at 44.

<sup>162</sup> *Id.* A multi-step process was used during the 2017 Master Plan to categorize potential projects. This process included a literature review and information gathering to identify a broad range of projects; a two-step screening process to refine the type of project; an evaluation of each project’s scope and merit; a technical analyses of factors such as the project’s costs, benefits, feasibility and environmental impact; and assigning each project to Tier 1 (high feasibility and approval ratings), Tier 2 (more moderate feasibility and approval ratings), an Tier 3 (required further research and development, or were already captured within another, larger project). *Texas Plan 2017*, *supra* note 151, at 5.

<sup>163</sup> *Texas Plan 2019*, *supra* note 153.

<sup>164</sup> *Id.*

<sup>165</sup> *Id.* at 8.

<sup>166</sup> “While the GLO coastal programs will continue to competitively evaluate project applications outside of the Texas Coastal Resiliency Master Plan process, this effort will be informed by the Resiliency Plan to assist with project funding prioritization.” *Id.* at 84.

<sup>167</sup> *Texas Plan 2017*, *supra* note 151, at 8.

<sup>168</sup> Following Hurricane Ike in 2008, and with the impacts of Hurricanes Katrina and Rita just a few years before that, the Gulf Coast Community Protection and Recovery District was created by the judges of six coastal counties. *About the GCCPRD*, Gulf Coast Community Protection and Recovery District, <https://www.gccprd.com/about-the-gccprd/> (last visited June 7, 2019).

<sup>169</sup> TEX. GEN. LAND OFF., STORM SURGE SUPPRESSION STUDY (2018), [http://box5735.temp.domains/~pgsqcemy/wp-content/uploads/2019/01/FORMATTED\\_GCCPRD-Phase-4-report-120718.pdf](http://box5735.temp.domains/~pgsqcemy/wp-content/uploads/2019/01/FORMATTED_GCCPRD-Phase-4-report-120718.pdf).

<sup>170</sup> *Id.* at 7.



GLO completed the Texas Coastal Infrastructure Study that “to help identify and prioritize critical infrastructure needs[.]”<sup>171</sup> Currently, the GLO is working with the United States Army Corps of Engineers to complete the Coastal Texas Protection and Restoration Feasibility Study.<sup>172</sup> This study, commonly known as the Coastal Texas Study, began in 2015 and expected to be complete in 2021. It is estimated to cost \$20 million, with a 50/50 federal to non-federal cost share split, and involves “engineering, economic, and environmental analyses on large-scale projects which could be considered by Congress for authorization and funding.”<sup>173</sup>

**Takeaway:** The Texas Master Plan is not particularly helpful to Virginia because Virginia no longer has a Land Office, and Texas is the only state that uses a General Land Office to oversee its coastal resilience efforts.<sup>174</sup> Also, Texas does not have a Chief Resilience Officer to oversee the implementation of its Master Plan.<sup>175</sup> Texas has also not yet explored innovative funding options for the projects set forth in its Master Plan.<sup>176</sup> Texas provides an example of a state with a single funding authority that has not yet found a way to leverage funding in the most effective way.<sup>177</sup>

However, the Texas Master Plan clearly sets forth specific projects that it would like to complete if it can find a way to finance them. And, having such projects identified has allowed Texas to “[p]rovide emergency appropriations requests to NOAA after Hurricane Harvey hit Texas [in 2017]”<sup>178</sup> and prioritize the administration of GOMESA funding to implement these projects.<sup>179</sup> Additionally, by organizing its Master Plan into different regions, it overcomes some of the challenges that come with parochial interests, which is a concern that has been noted by some in Virginia.<sup>180</sup> The Texas Master Plan is helpful to Virginia because it provides an example of an organized Master Plan with specific priorities, despite the fact that it has not yet acquired funding for many of the projects it describes.<sup>181</sup>

## VI. FLORIDA

Florida provides an interesting case study because its efforts to increase coastal resiliency at the state level have largely failed. However, Florida has been successful in increasing coastal resiliency through regional coordination.<sup>182</sup> There are two regional compacts in Florida. The

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<sup>171</sup> TEX. GEN. LAND OFF., TEXAS COASTAL RESILIENCY STUDY FINAL REPORT (2017),

<http://www.glo.texas.gov/coastal-grants/documents/grant-project/texas-coastal-resiliency-study-2017.pdf>;

<sup>172</sup> *Coastal Texas Protection & Restoration Feasibility Study*, TEXAS.GOV, <https://coastalstudy.texas.gov/> (last visited June, 7, 2019).

<sup>173</sup> *Id.* The GLO is the non-federal sponsor for the study.

<sup>174</sup> *See Texas Plan 2019*, *supra* note 153.

<sup>175</sup> *See id.*

<sup>176</sup> *See id.*

<sup>177</sup> *See id.*

<sup>178</sup> *Id.* at 8.

<sup>179</sup> *Id.* at 5.

<sup>180</sup> *See id.*

<sup>181</sup> *Id.*

<sup>182</sup> *Southeast Florida Regional Climate Change Compact*, SE. FLA. REG’L CLIMATE CHANGE COMPACT, <http://southeastfloridaclimatecompact.org/wp-content/uploads/2014/09/compact.pdf> (Last visited June 7, 2019).

Southeast Florida Regional Climate Change Compact (“the Compact”) is the most successful regional climate agreement in Florida.<sup>183</sup> In 2010, Broward, Miami-Dade, Monroe, and Palm Beach Counties united to form the Compact.<sup>184</sup> This regional Compact is unique in that it allows local governments to take the lead in adaptation measures while also uniting to create a cooperative plan.<sup>185</sup> In 2012, the Compact created the Regional Climate Action Plan, and in 2017, the Compact released the Regional Climate Action Plan 2.0, which has 12 primary goals.<sup>186</sup> The Climate Action Plan is an “effort to foster sustainability and climate resilience on the regional scale,” however, it address coastal issues specifically too.<sup>187</sup>

Initially, the Compact did not have a clear source of funding.<sup>188</sup> Although the Compact received some grant funding from the Kresge Foundation, it relied mainly on outside entities and volunteers for assistance.<sup>189</sup> Each county volunteered to dedicate staff to work on the Compact, and universities, non-profits, federal agencies, and other entities also provided in-kind donations.<sup>190</sup> The South Florida Water Management District (SFWMD), the Nature Conservancy (TNC), and the South Florida Regional Planning Center (SFRPC) are some of the entities that have been instrumental in leading the Compact from the beginning.<sup>191</sup> The Compact is not a formal legal entity, and it receives funding through its fiscal agent, the Institute for Sustainable Communities (ISC).<sup>192</sup> The ISC is a 501(c)(3) tax-exempt organization that can receive private, tax-exempt grants on behalf of the Compact.<sup>193</sup> ISC acts as a financing authority for the Compact, but ISC also supports additional sustainability projects around the world.<sup>194</sup>

Today the Compact receives funding from multiple sources. The Kresge Foundation continues to support the Compact.<sup>195</sup> The Compact also received a Community Development Block Grant (CDBG) from the U.S. Department of Housing and Urban Development.<sup>196</sup> This federal grant was used to fund “Seven50: Southeast Florida Prosperity Plan,” which recommends resilience measures in the region.<sup>197</sup> Other federal grants received by the Compact include a NOAA

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<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

<sup>185</sup> *Id.*

<sup>186</sup> These include: agriculture, compact coordination, energy and fuel, natural systems, public health, public outreach and engagement, public policy advocacy, regional economic resilience, risk reduction and energy management, social equity, sustainable communities and transportation, and water. *Regional Climate Action Plan 2.0 (Abridged Version)*, SE. FLA. REG’L CLIMATE CHANGE COMPACT (2017), <http://southeastfloridaclimatecompact.org/wp-content/uploads/2018/04/RCAP-2.0-Abridged-Version.pdf>.

<sup>187</sup> *Id.* at 4, 21.

<sup>188</sup> *Lessons in Regional Resilience: The Southeast Florida Regional Climate Change Compact*, GEO. CLIMATE CTR., 13 (2017), [https://www.georgetownclimate.org/files/report/GCC-Lessons-in-Regional-Resilience-SE\\_FL\\_Compact-Jan\\_2017-v2.pdf](https://www.georgetownclimate.org/files/report/GCC-Lessons-in-Regional-Resilience-SE_FL_Compact-Jan_2017-v2.pdf).

<sup>189</sup> *Id.* at 13-14.

<sup>190</sup> *Id.*

<sup>191</sup> *Id.* at 1.

<sup>192</sup> *Id.* at 3.

<sup>193</sup> *Id.* at 6.

<sup>194</sup> *See id.*

<sup>195</sup> *Id.* at 14.

<sup>196</sup> *Id.*

<sup>197</sup> *Id.*

Special Merit Competition Grant and a Department of Transportation Climate Resilience Pilot Plot Grant.<sup>198</sup> The counties in the Compact have also committed to spend \$100,000 each over the course of two years to administer the Compact and engage in fundraising efforts to secure additional funding.<sup>199</sup> The Compact also works with local universities when applying for grants to ensure that the local universities are working on projects that will support their needs.<sup>200</sup>

The second regional group is the Northeast Florida Regional Council (the “Council”).<sup>201</sup> The Council is made up of seven counties (Baker, Clay, Duval, Flagler, Nassau, Putnam, and St. Johns).<sup>202</sup> The Council issued a “Summary and Regional Action Plan, A Report of the Emergency Preparedness Committee on Sea Level Rise in November of 2013.”<sup>203</sup> This is an unfunded program, and volunteers on the Emergency Preparedness Committee reviewed the work of the Southeast Florida Regional Climate Change Compact to determine that the northeast region is also vulnerable to climate change and should prepare for sea level rise.<sup>204</sup> Local experts aided the Emergency Preparedness Committee to develop the Plan, but the Council still has less funding than the Compact and has had less success.<sup>205</sup>

Additionally, in 2011, Florida enacted the Community Planning Act, which allows local governments to create Adaptation Action Areas (AAAs).<sup>206</sup> An AAA is a planning designation for a vulnerable area that will likely be affected by flooding, storm surge, and sea level rise.<sup>207</sup> Florida prioritizes funding for resilience measures in these areas, and in 2011, NOAA approved a project led by the Florida Department of Economic Opportunity (DEO) titled, “Community Resiliency: Planning for Sea Level Rise,” which was designed to help local governments create AAAs and improve other resiliency planning efforts.<sup>208</sup> Fort Lauderdale is an example of a community that has experienced success in creating AAAs. The city now has 17 AAAs, and 42 projects are either active or complete in the AAAs that were created there.<sup>209</sup>

The DEO also provides Community Planning Technical Assistance Grants to local governments, which assist local governments in creating economic development strategies and

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<sup>198</sup> *Id.*

<sup>199</sup> *Id.* at 15.

<sup>200</sup> *Id.*

<sup>201</sup> *Summary and Regional Action Plan, A Report of the Emergency Preparedness Committee on Sea Level Rise*, NE. FLA. REG’L COUNCIL, <https://www.nefrc.org/WiP/PDFs/Resource-Library/Regional-Action-Plan.pdf> (2013).

<sup>202</sup> *Id.*

<sup>203</sup> *Id.*

<sup>204</sup> *Id.*

<sup>205</sup> *Id.*

<sup>206</sup> H.B. 7207, 2011 Leg., Reg. Sess. (Fla. 2011).

<sup>207</sup> *Id.*

<sup>208</sup> *Florida’s Community Resilience Initiative – Planning for Sea Level Rise*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/florida-s-community-resilience-initiative-planning-for-sea-level-rise.html> (Last visited June 7, 2019).

<sup>209</sup> *Fiscal Years 2019-2023, Adopted Community Investment Plan*, CITY OF FORT LAUDERDALE, <https://www.fortlauderdale.gov/home/showdocument?id=34173> (last visited June 7, 2019).

comprehensive plans that consider the impacts of climate change.<sup>210</sup> Florida’s Department of Environmental Protection (DEP) provides funding to local governments through the Coastal Partnership Initiative (CPI), which is funded by NOAA through Florida’s Coastal Management Program.<sup>211</sup> There are four priority areas eligible for CPI funding, and one of them relates to resilient communities.<sup>212</sup> This funding helps “coastal communities prepare for and respond to the effects of climate change” through “vulnerability analysis and risk assessment, development redevelopment plans and strategies, restoring coastal wetlands, developing energy strategies, and improving resiliency to coastal hazards.”<sup>213</sup>

**Takeaway:** Florida’s regional efforts can help guide Virginia because the Compact demonstrates that coordination between localities can achieve effective results.<sup>214</sup> Also, good planning and coordination can increase coastal resilience before funding mechanisms are developed.<sup>215</sup> The Compact set forth feasible goals, and the Compact’s early successes gave investors confidence in the Compact, which resulted in greater funding.<sup>216</sup> The Compact implements projects primarily through grant funding, but it has still seen many successes.<sup>217</sup> The Compact continues to thrive due to the relationships it has fostered and the effective framework it set forth for coordination.<sup>218</sup> However, Virginia should keep in mind that Florida is a Home Rule, rather than a Dillon Rule, state.<sup>219</sup> This means that localities in Virginia likely have less authority to develop similar local partnerships.<sup>220</sup>

## VII. NEW YORK

Executive Order No. 24 created the New York State Climate Action Council (the “Council”) and directed the Council to create a climate action plan.<sup>221</sup> The Council “consisted of 15 state agency heads or representatives of the Executive Chamber.”<sup>222</sup> In 2010, the Council released an Interim Climate Action Plan (ICPA) with the assistance of the New York State Energy Research and Development Authority, the Department of Environmental Conservation, and the

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<sup>210</sup> *Technical Assistance*, FLA. DEP’T OF ECON. OPPORTUNITY, <http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/technical-assistance> (last visited June 6, 2019).

<sup>211</sup> *Florida Coastal Management Program*, FLA. DEP’T OF ENVTL. PROT. <https://floridadep.gov/rcp/fcmp> (last visited June 7, 2019).

<sup>212</sup> *Florida’s Coastal Partnership Initiative*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/florida-s-coastal-partnership-initiative.html>. (last visited June 7, 2019).

<sup>213</sup> *Id.*

<sup>214</sup> *See Regional Climate Action Plan 2.0 (Abridged Version)*, *supra* note 185.

<sup>215</sup> *See id.*

<sup>216</sup> *See id.*

<sup>217</sup> *See id.*

<sup>218</sup> *See id.*

<sup>219</sup> *Understanding Florida’s Home Rule Power*, FLA. LEAGUE OF CITIES (May 10, 2011), <http://www.floridaleagueofcities.com/docs/default-source/Civic-Education/historyofhomerule.pdf?sfvrsn=2>.

<sup>220</sup> *See id.*

<sup>221</sup> N.Y. Exec. Order No. 24 (2009), <http://www.dec.ny.gov/energy/71394.html>.

<sup>222</sup> *Climate Action Plan Interim Report*, DEP’T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/energy/80930.html> (last visited June 7, 2019).

Center for Climate Strategies.<sup>223</sup> The ICPA prioritizes the reduction of greenhouse gas emissions and projects that will lead to economic development.<sup>224</sup> Although the ICPA focuses on clean energy and the reduction of greenhouse gasses, it also discusses the dangers of coastal flooding and the need to become more resilient.<sup>225</sup> The ICPA also describes many examples of funding possibilities for climate related projects and encourages both public and private investment.<sup>226</sup> Perhaps because Hurricane Sandy hit New York two years after the ICPA was released, New York’s coastal resilience efforts shifted and the ICPA remains largely ignored.<sup>227</sup>

In 2014, Governor Cuomo signed the Community Risk and Resiliency Act (CRRRA), which directed the Department of Environmental Conservation (DEC) to “establish statewide sea-level-rise projections.”<sup>228</sup> The CRRRA requires that the established projections are considered in certain funding and permitting decisions.<sup>229</sup> The CRRRA implemented a number of the NYS 2100 Commission’s recommendations, which was the Commission created by Governor Cuomo in 2012 in response to Hurricane Sandy.<sup>230</sup>

Additionally, New York has several state agency programs that provide funds to improve resiliency efforts in the state. The DEC administers the New York State Climate Smart Communities Grant Program that “provides a matching grant to towns, villages, counties, and boroughs of New York City to implement projects related to climate change adaptation or mitigation.”<sup>231</sup> Approximately \$8 million was set aside for this program in 2018, and individual awards ranged from \$10,000 to \$2,000,000.<sup>232</sup> The DEC also awards grants through the Open Space Conservation Plan and the Environmental Protection Fund (EPF).<sup>233</sup> The EPF “is financed primarily through a dedicated portion of real estate transfer taxes,” and the EPF has provided \$2.7 billion to projects over 20 years.<sup>234</sup> EPF grants have been awarded to projects that improve resiliency, and two examples are (1) the Hudson River Estuary Program and (2) the Ocean and the Local Waterfront Revitalization Program.<sup>235</sup> The New York State Water Infrastructure Improvement Act Grant Program awards grants to local governments for wastewater infrastructure upgrades and gives preference to “projects that increase resiliency to sea level rise and extreme

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<sup>223</sup> *Id.*

<sup>224</sup> *Id.*

<sup>225</sup> *Id.*

<sup>226</sup> *Id.*

<sup>227</sup> *See id.*

<sup>228</sup> *New York Community Risk and Resiliency Act*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/new-york-community-risk-and-resiliency-act-s06617b.html> (last visited June 7, 2019).

<sup>229</sup> *Id.*

<sup>230</sup> *Id.*

<sup>231</sup> *New York State Climate Smart Communities Grant Program*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/new-york-state-climate-smart-communities-grant-program.html?preview=true> (last visited June 7, 2019).

<sup>232</sup> *Id.*

<sup>233</sup> *Environmental Protection Fund*, N.Y. ST. DEP’T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/about/92815.html> (last visited June 7, 2019).

<sup>234</sup> *Id.*

<sup>235</sup> *Summary of State Agency Action*, GEO. CLIMATE CTR., <https://www.georgetownclimate.org/adaptation/state-information/new-york/adaptation-plan-status.html> (Last visited May 2, 2019).

weather events.”<sup>236</sup> The money to fund the program was set aside by the New York legislature to address concerns about public health and the expenses associated with operating wastewater treatment facilities.<sup>237</sup> About \$200 million was set aside for this program.<sup>238</sup>

**Takeaway:** New York has not created a coastal resilience authority, and it has largely decided to ignore the ICAP that its Council developed.<sup>239</sup> This is interesting, as the structure of New York’s Council is very similar to coastal resilience councils created in other states.<sup>240</sup> Although New York has essentially ignored its plan, it has been working to improve coastal resilience through state legislation and other financing mechanisms.<sup>241</sup> The local programs in New York would likely be more helpful for Virginia to study than the ICAP.<sup>242</sup>

## VIII. NEW JERSEY

New Jersey has not yet developed a coastal resilience authority or a master plan. However, in October of 2018, the Department of Environmental Protection (DEP) held a summit to begin work on its Coastal Resilience Plan.<sup>243</sup> New Jersey’s Coastal Resilience Plan is the “first step for the DEP to evaluate how its policies and programs allow for local, regional, and state response to climate change in the coastal zone.”<sup>244</sup> In the meantime, the DEP has taken other measures to make the state more resilient.<sup>245</sup> In 2011, DEP partnered with the nonprofit Sustainable Jersey, and in 2014, Sustainable Jersey created the New Jersey Resiliency Network, which provides technical and financial assistance to local governments.<sup>246</sup> The New Jersey Resiliency Network has a Small Grants Program, which funds community sustainability projects.<sup>247</sup> The New Jersey Resiliency Network is funded by the New Jersey Recovery Fund<sup>248</sup> and the Surdna Foundation.<sup>249</sup> The Network’s website also provides a “database of financial and technical resources for New Jersey

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<sup>236</sup> *New York State Water Infrastructure Improvement Act Grant Program*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/new-york-state-water-infrastructure-improvement-act-grant-program.html> (last visited June 7, 2019).

<sup>237</sup> *Id.*

<sup>238</sup> *Id.*

<sup>239</sup> See *Climate Action Plan Interim Report*, *supra* notes 221-224.

<sup>240</sup> See *id.*

<sup>241</sup> See notes 227-237 and accompanying text, *supra*.

<sup>242</sup> See *id.*

<sup>243</sup> *New Jersey Coastal Resilience Plan*, ST. OF N.J. DEP’T OF ENVTL. PROT., <https://www.nj.gov/dep/coastalresilience/>, (last visited June 7, 2019).

<sup>244</sup> *Id.*

<sup>245</sup> *Id.*

<sup>246</sup> *New Jersey Resiliency Network*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/new-jersey-resiliency-network.html> (last visited June 7, 2019).

<sup>247</sup> *Id.*

<sup>248</sup> The New Jersey Recovery Fund “is a joint effort among local and national foundations, New Jersey Corporations, and individuals to support New Jersey’s communities and nonprofit organizations that are effected by or responding to Hurricane Sandy.” *New Jersey Recovery Fund*, CMTY. FOUND. OF N.J., <https://www.cfnj.org/new-jersey-recovery/> (last visited June 7, 2019).

<sup>249</sup> See *New Jersey Resiliency Network*, *supra* note 245.

communities.”<sup>250</sup> Some of the financial resources listed include: grants, incentives, tax credits, volunteer resources, scholarships, rebates, and loans.<sup>251</sup>

The Bureau of Flood Resilience, the Division of Coastal Engineering, and the Blue Acres program also work to increase coastal resilience in the state.<sup>252</sup> The Bureau of Flood Resilience is a part of the DEP and was funded by the U.S. Department of Housing and Urban Development (HUD) after Hurricane Sandy.<sup>253</sup> This Bureau uses federal grant money to construct risk reduction projects in high vulnerability areas.<sup>254</sup> The Division of Coastal Engineering uses the Shore Protection Program to develop projects that protect the shorelines from erosion, storm surge, and sea level rise.<sup>255</sup> Blue Acres program was created through the Green Acres, Farmland, Blue Acres, and Historic Preservation Bond Act of 2007, which set aside \$12,000,000 for the acquisition of land in certain floodways.<sup>256</sup> The Green Acres, Water Supply and Floodplain Protection, and Farmland and Historic Preservation Bond Act of 2009 set aside an additional \$24,000,000 for the program, and the land acquired is used for recreation or conservation purposes.<sup>257</sup> The program has been successful, and the state is acquiring “approximately 1,000 properties in tidal areas affected by Sandy and another 300 properties in other towns that have flooded repeatedly.”<sup>258</sup>

Additionally, the New Jersey Climate Adaptation Alliance (the “Alliance”) provides helpful information regarding funding options for resiliency measures.<sup>259</sup> The Alliance is composed of “more than 30 nonprofit, government, academic, and business organizations working to build climate change preparedness capacity in New Jersey.”<sup>260</sup> In 2014, the Alliance also published “Climate Change Preparedness and Resiliency: Funding and Financing Strategies for New Jersey,” which lists potential funding sources for the state.<sup>261</sup> Although New Jersey has not implemented many of the funding ideas discussed in the article, it provides a helpful overview of different funding ideas for resiliency efforts.<sup>262</sup>

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<sup>250</sup> *Id.*

<sup>251</sup> “The Hot List”, N.J. RESILIENCY NETWORK, <http://www.njresiliency.com/grants-portal/resource-database/> (last visited June 7, 2019).

<sup>252</sup> *New Jersey Coastal Resilience Plan*, *supra* note 242.

<sup>253</sup> *Id.*

<sup>254</sup> *Bureau of Flood Resilience*, ST. OF N.J. DEP’T OF ENVTL. PROT., <https://www.nj.gov/dep/floodresilience/> (last visited June 7, 2019).

<sup>255</sup> *Division of Coastal Engineering*, ST. OF N.J. DEP’T OF ENVTL. PROT., <https://www.nj.gov/dep/shoreprotection/> (last visited June 7, 2019).

<sup>256</sup> *Blue Acres Floodplain Acquisitions*, ST. OF N.J. DEP’T OF ENVTL. PROT., [https://www.nj.gov/dep/greenacres/blue\\_flood\\_ac.html](https://www.nj.gov/dep/greenacres/blue_flood_ac.html) (last visited June 7, 2019).

<sup>257</sup> *Id.*

<sup>258</sup> *Blue Acres Buyout Program*, ST. OF N.J., DEP’T OF CMTY. AFF., <https://www.renewjerseystronger.org/homeowners/blue-acres-buyout-program/> (last visited June 7, 2019).

<sup>259</sup> *Resilience. Preparing New Jersey for Climate Change: Policy Considerations from the NJ Climate Adaptation Alliance*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/resilience-preparing-new-jersey-for-climate-change-policy-considerations-from-the-nj-climate-adaptation-alliance.html> (last visited June 7, 2019).

<sup>260</sup> *Id.*

<sup>261</sup> N.J. Climate Adaptation All., *Climate Change Preparedness and Resiliency: Funding and Financing Strategies for New Jersey*, RUTGERS U. (2014), <https://njadapt.rutgers.edu/docman-lister/working-briefs/114-climate-additional-report/file>.

<sup>262</sup> *Id.*

**Takeaway:** Because New Jersey has not yet created an authority or a master plan, it may not be the most helpful state for Virginia to study. However, New Jersey is a good example of a state that has increased coastal resilience at the agency level, and it has also been successful in developing a program for acquiring land in high-risk areas.<sup>263</sup> Furthermore, New Jersey has several databases and secondary sources that discuss potential financing mechanisms that could be of use to Virginia, even if the mechanisms have not yet been utilized.<sup>264</sup> Finally, because New Jersey is in the process of developing a coastal resilience plan, it may develop more resources that would be helpful to Virginia in the near future.<sup>265</sup>

## IX. OTHER STATES

Other states have also taken actions to increase resilience efforts. This section will discuss some of the resilience measures taken in Alaska, California, Connecticut, Delaware, the District of Columbia, Hawaii, Maine, Maryland, New Hampshire, and Washington.

### A. Alaska

In 2017, Governor Walker issued Administrative Order No. 289, which created a Climate Action for Alaska Leadership Team.<sup>266</sup> The Executive Order directs the Leadership Team to develop an Alaska Climate Change Strategy, and a Climate Action Plan was released in September 2018.<sup>267</sup> The state also created a climate change website, but it was taken down after Governor Dunleavy took office.<sup>268</sup> Alaska's recent resilience measures have been archived, and the state is not moving forward with funding the recommendations sets forth in the Climate Action Plan.<sup>269</sup>

### B. California

The California Coastal Conservancy Climate Ready program provides grants to projects that improve coastal resiliency.<sup>270</sup> It "is focused on supporting planning, project implementation and multi-agency coordination to advance actions that will increase the resilience of coastal communities and ecosystems."<sup>271</sup> The program is funded by cap-and-trade proceeds from the

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<sup>263</sup> See *Blue Acres Floodplain Acquisitions*, *supra* note 255.

<sup>264</sup> See "The Hot List", *supra* note 250.

<sup>265</sup> See *New Jersey Coastal Resilience Plan*, *supra* note 242.

<sup>266</sup> *Alaska Order 289: Climate Change Strategy, Climate Action Leadership Team*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/alaska-order-289-climate-change-strategy-climate-action-leadership-team.html> (last visited June 7, 2019).

<sup>267</sup> *Id.*

<sup>268</sup> *Climate Change Report Removed from Alaska DEC Website*, COLUM. L. SCH., SABIN CTR. FOR CLIMATE CHANGE L. (Dec. 4, 2018), <http://columbiaclimatelaw.com/silencing-science-tracker/climate-change-report-removed-from-alaska-dec-website/> (last visited June 7, 2019).

<sup>269</sup> *Id.*

<sup>270</sup> *The Coastal Conservancy and Climate Change*, COASTAL CONSERVANCY ST. OF CAL., <http://scc.ca.gov/climate-change/> (last visited June 7, 2019).

<sup>271</sup> *Id.*



greenhouse gas reduction fund (GGRF).<sup>272</sup> Over \$9 billion “have been appropriated by the Legislature to State agencies implementing GHG emission reduction programs and projects.”<sup>273</sup> California’s Wildlife Conservation Board is also funded by the GGRF, and it provides grants to restoration projects that will improve resiliency.<sup>274</sup> It seeks to “protect and restore ecosystems on natural and working lands to provide climate change adaptation and resilience for wildlife.”<sup>275</sup>

### C. Connecticut

In June 2018, the Connecticut legislature passed Public Act 18-82, which requires state agencies and local governments to consider updated sea-level rise projections in their plans starting October 2019.<sup>276</sup> The sea-level rise projections are set by the Marine Sciences Division of the University of Connecticut.<sup>277</sup> Connecticut finances resiliency improvements for structures subject to flooding and extreme storms through the Shore Up Connecticut Loan Program, which is a loan program administered by the Housing Development Fund, a nonprofit organization.<sup>278</sup> The program provides loans to home and business owners and was funded by a \$25,000,000 bond authorized by the Connecticut legislature.<sup>279</sup> Connecticut also finances resiliency improvements through the Connecticut Green Bank, which supports homeowners and businesses.<sup>280</sup> The Connecticut Green Bank is more focused on clean energy than resilience, but it is still a helpful model of an entity that provides financial assistance to homeowners and businesses to complete projects.<sup>281</sup>

### D. Delaware

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<sup>272</sup> *California Coastal Conservancy Climate Ready Grant Program*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/california-coastal-conservancy-climate-ready-grant-program.html> (last visited June 7, 2019).

<sup>273</sup> *About California Climate Investments*, CAL. CLIMATE INVS., <http://www.caclimateinvestments.ca.gov/about-cci> (last visited June 7, 2019).

<sup>274</sup> *Climate Adaptation and Resiliency Program*, ST. OF CAL. WILDLIFE CONSERVATION BD., <https://wcb.ca.gov/Programs/Climate-Adaptation> (last visited June 7, 2019).

<sup>275</sup> *Id.*

<sup>276</sup> Conn. S. B. No. 7, Pub. Act 18-82 (2018), [https://www.cga.ct.gov/2018/ACT/pa/2018PA-00082-R00SB-00007-PA.htm?utm\\_source=Federal+State+Policy+Updates+June+2018&utm\\_campaign=State+and+Federal+Updates&utm\\_medium=email](https://www.cga.ct.gov/2018/ACT/pa/2018PA-00082-R00SB-00007-PA.htm?utm_source=Federal+State+Policy+Updates+June+2018&utm_campaign=State+and+Federal+Updates&utm_medium=email).

<sup>277</sup> *Id.*

<sup>278</sup> *Shore Up Connecticut Loan Program*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/shore-up-connecticut-loan-program.html> (last visited June 7, 2019).

<sup>279</sup> *Id.*

<sup>280</sup> *Changing Connecticut for the Greener*, CONN. GREEN BANK, <https://www.ctgreenbank.com/about-us/> (last visited June 7, 2019).

<sup>281</sup> *Id.*

Delaware established a Sea Level Rise Advisory Committee (SLRAC) in 2010.<sup>282</sup> SLRAC has released reports in 2012, 2013, and 2017, and the reports are largely funded through grants from the NOAA Office of Coastal Management.<sup>283</sup> Delaware also administers the Coastal Management Assistance Program, which awards grants to local communities to improve coastal resilience.<sup>284</sup> The program is funded by the NOAA Office of Coastal Management too.<sup>285</sup> Also, the Institute for Public Administration at the University of Delaware created a website that provides a database of funding options for local governments to improve resiliency, and this website covers funding sources that are broader than just coastal resilience.<sup>286</sup>

## E. District of Columbia

In July 2018, D.C. enacted the D.C. Green Finance Authority Establishment Act, which made D.C. the first city in the U.S. to create a Green Bank.<sup>287</sup> The Green Bank will finance homeowners and businesses through offering loans, leases, credit enhancements, and other financing services.<sup>288</sup> The “Bank will be capitalized with limited public funds to attract private capital investment.”<sup>289</sup> The Bank hopes to gain “private capital at a ratio of at least 5 private dollars to every 1 dollar of public investment,” and it will use bonds to increase its ability to finance projects.<sup>290</sup> The Bank is not particularly focused on coastal resilience issues, but it is still a helpful model of a funding authority.<sup>291</sup>

## F. Hawaii

In June 2014, Hawaii established an Interagency Climate Adaptation Committee, which was renamed the Hawaii Climate Change Mitigation and Adaptation Commission in 2017.<sup>292</sup> It

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<sup>282</sup> *Recommendation of Sea Level Rise Planning Scenarios for Delaware, Technical Report*, DEL. SEA LEVEL RISE TECH. COMM. (2017), [https://www.dgs.udel.edu/sites/default/files/projects-docs/DE%202017%20SLR%20Technical%20Report\\_Mar2018.pdf](https://www.dgs.udel.edu/sites/default/files/projects-docs/DE%202017%20SLR%20Technical%20Report_Mar2018.pdf).

<sup>283</sup> *Id.*

<sup>284</sup> *Delaware Coastal Management Assistance Program*, GEO. CLIMATE CTR., <https://www.adaptationclearinghouse.org/resources/delaware-coastal-management-assistance-program.html> (last visited June 7, 2019)

<sup>285</sup> *Id.*

<sup>286</sup> *Delaware Database for Funding Resilient Communities*, U. OF DEL., JOSEPH R. BIDEN, JR. SCH. OF PUB. POL’Y & ADMIN., <https://www.bidenschool.udel.edu/research-public-service/ddfrc> (last visited June 7, 2019).

<sup>287</sup> DC GREEN BANK, <https://dcgreenbank.org> (last visited June 7, 2019).

<sup>288</sup> *Id.*

<sup>289</sup> *DC Green Bank*, D.C. DEP’T OF ENERGY & ENV’T, <https://doee.dc.gov/greenbank> (last visited June 7, 2019).

<sup>290</sup> *Id.*

<sup>291</sup> *Id.*

<sup>292</sup> Haw. S. B. No. 559 (2017), <https://legiscan.com/HI/text/SB559/2017>.

released the Hawaii Sea Level Rise Vulnerability and Adaptation Report in December 2017.<sup>293</sup> The report recommends amending the State Legacy Lands Act to provide funding for coastal resilience projects and securing additional funding sources.<sup>294</sup> The report does not list many existing funding sources that could support its goals.<sup>295</sup> Hawaii’s report is particularly concerned with resiliency issues relating to sea level rise.<sup>296</sup>

## G. Maine

In November 2013, the Environmental and Energy Resources Working Group (EERWG) was created to assess Maine’s climate change vulnerabilities and to coordinate agencies’ responses.<sup>297</sup> In 2014, EERWG released “Monitoring, Mapping, Modeling, Mitigation, and Messaging: Maine Prepares for Climate Change.”<sup>298</sup> The projects set forth in the report are to be funded by the Federal Highway Administration, FEMA, a competitive grant from NOAA, and the State Revolving Fund.<sup>299</sup> The Maine Interagency Climate Adaptation (MICA) Work Group succeeded EERWG and released an update to the 2014 report in 2018.<sup>300</sup> The Department of Environmental Protection also created the Maine Climate Adaptation Toolkit, which is an online database that provides information about Maine’s resiliency efforts.<sup>301</sup> The state is still working to better coordinate resilience efforts in various agencies, and the majority of its resilience efforts are not focused on coastal resilience in particular.<sup>302</sup>

## H. Maryland

Maryland’s Community Resilience Program uses state and federal funds to encourage localities to improve resiliency.<sup>303</sup> NOAA provides most of the funding for the coastal portions of this program, but the state has expanded the program beyond that.<sup>304</sup> The Maryland Commission on Climate Change, which was expanded by an Executive Order in 2014, also works to coordinate

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<sup>293</sup> *Hawai’i Sea Level Rise Vulnerability and Adaptation Report*, HAW. CLIMATE COMM’N (2017), [https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report\\_Dec2017.pdf](https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf).

<sup>294</sup> *Id.*

<sup>295</sup> *Id.*

<sup>296</sup> *Id.*

<sup>297</sup> *Monitoring, Mapping, Modeling, Mitigation, and Messaging: Maine Prepares for Climate Change*, ME. DEP’T OF ENVTL. PROT. (2014), <https://www.maine.gov/dep/sustainability/climate/Working%20Group%20maine%20prepares.pdf>.

<sup>298</sup> *Id.*

<sup>299</sup> *Id.*

<sup>300</sup> *The Maine Interagency Climate Adaptation (MICA) Work Group*, ME. DEP’T OF ENVTL. PROT., <https://www.maine.gov/dep/sustainability/climate/mica.html> (Last visited June 6, 2019).

<sup>301</sup> *Id.*

<sup>302</sup> *Id.*

<sup>303</sup> *Community Resilience Program*, MD. DEP’T OF NAT. RES., <http://dnr.maryland.gov/ccs/coastsmart/Pages/grants.aspx> (Last visited June 6, 2019).

<sup>304</sup> *Id.*

agencies' resilience programs.<sup>305</sup> Maryland's approach is consistent with that taken in many states because agency coordination has led to effective results.<sup>306</sup> Maryland's resiliency efforts are focused both on coastal resiliency and other climate adaptation efforts."<sup>307</sup>

## I. New Hampshire

The New Hampshire Legislature created the Coastal Risk and Hazards Commission in 2013, which expired in 2016.<sup>308</sup> However, the state passed another bill in 2016, which directs the Department of Environmental Services (DES) to convene and supervise a multi-agency team to summarize coastal flooding issues.<sup>309</sup> The Team is set to meet every five years beginning in July of 2019.<sup>310</sup> In 2017, New Hampshire enacted legislation that allows municipalities to create a tax incentive program that will encourage coastal resilience.<sup>311</sup> Localities can establish "Coastal Resilience Incentive Zones," which provide homeowners with tax relief when they undertake resilience measures within those zones.<sup>312</sup> There is a lot of discretion in determining what counts as a "resilience measure."<sup>313</sup> Virginia recently took similar steps to provide localities with the authority to adopt an ordinance which "provide[s] a partial tax exemption for improved real estate that is subject to recurrent flooding and upon which qualifying flood improvements have been made."<sup>314</sup>

## J. Washington

In 2013, Washington established the Coastal Hazards Resilience Network (CHRN).<sup>315</sup> The Project is an attempt "to rapidly increase the state's capacity to prepare for natural events that threaten the coast."<sup>316</sup> It was funded by NOAA and is managed by the Washington Department of

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<sup>305</sup> Md. Exec. Order 01.01.2014.14 (2014), <https://mde.state.md.us/programs/Marylander/Documents/MCCC/Publications/ExecutiveOrders/EOStrengClimateAction.pdf>.

<sup>306</sup> See *Community Resilience Program*, *supra* note 302.

<sup>307</sup> *Id.*

<sup>308</sup> N.H. S. B. No. 374 (2016), <https://legiscan.com/NH/text/SB374/2016>.

<sup>309</sup> *Id.*

<sup>310</sup> *Id.*

<sup>311</sup> N.H. REV. STAT. ANN. § 79-E:4-a (LexisNexis 2017).

<sup>312</sup> *Id.*

<sup>313</sup> "The municipality implementing a [coastal resilience incentive zone] shall determine the resilience measures it deems qualifying, such as, but not limited to, elevation and free-board renovations, elevation of mechanicals, construction of resilient natural features, enhancement or creation of tidal marshes, elevation of private driveways and sidewalks, construction or enlargement of private culverts and other structures to enable increased water flow and storm-surge, and movement of property to higher elevation on the property or to a newly acquired property at a higher elevation within the municipality." *Id.* § 79-E:4-a(II).

<sup>314</sup> VA. CODE ANN. § 58.1-3228.1 (2019). This authority became effective on July 1, 2019 and, as of the time of the publication of this student white paper, no locality had taken steps to enact such an ordinance.

<sup>315</sup> *Washington Coastal Resilience Project: Bolstering resilience to coastal hazards*, WASH. COASTAL HAZARDS RESILIENCE NETWORK, <http://www.wacoastalnetwork.com/washington-coastal-resilience-project.html> (last visited June 10, 2019).

<sup>316</sup> *Id.*

Ecology and Washington Sea Grant.<sup>317</sup> It is made up of over 100 stakeholder members and works to coordinate agency efforts and share resources.<sup>318</sup> Washington could provide a useful model to Virginia because it has had success in coordinating efforts between many stakeholders and agencies.<sup>319</sup>

## X. VIRGINIA

If Virginia does not choose to create a Coastal Resilience Development Authority, it could expand the role of existing entities and programs to finance resilience projects. Although Virginia has existing options that could provide financing for local governments, homeowners, commercial businesses, and public projects, none of these were initially designed to fund resilience efforts. However, some of these entities and options, discussed in more detail below, could be expanded or used in creative ways to do so.

### A. Virginia Resources Authority

The Virginia Resources Authority (VRA) is one potential source for financing within the Commonwealth.<sup>320</sup> The VRA was established by the General Assembly in 1984, and it “provides innovative, cost-effective and sustainable financial solutions to build vibrant and healthy Virginia communities.”<sup>321</sup> The VRA mostly provides loans to local governments in Virginia.<sup>322</sup> However, it also administers some grants.<sup>323</sup> Most of its programs are attached to agency partners, and the VRA and corresponding agency co-manage the program together.<sup>324</sup> The agency will set the priorities for the program, and the VRA will handle the financial aspects of the program such as underwriting the loans.<sup>325</sup> Each program that the VRA administers has its own separate account from which to disperse funds.<sup>326</sup>

The VRA’s current policies and processes are geared for local government lending, rather than loans to homeowners or commercial businesses.<sup>327</sup> Homeowners and businesses are different from localities from a credit standpoint, and the VRA is not set up to administer such loans.<sup>328</sup> However, the structure of the VRA also possesses certain advantages.<sup>329</sup> The VRA ensures that

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<sup>317</sup> *Id.*

<sup>318</sup> *Washington Coastal Hazards Resilience Network, About Us*, WASH. COASTAL HAZARDS RESILIENCE NETWORK, <http://www.wacoastalnetwork.com/about-us.html> (last visited June 10, 2019).

<sup>319</sup> *See id.*

<sup>320</sup> *About VRA*, VA. RES. AUTH., <https://www.virginiaresources.gov/page/about-vra/> (last visited June 10, 2019).

<sup>321</sup> *Id.*

<sup>322</sup> Telephone Interview with Shawn Crumlish, *supra* note 58.

<sup>323</sup> *Id.*

<sup>324</sup> *Id.*

<sup>325</sup> *Id.*

<sup>326</sup> *Id.*

<sup>327</sup> *Id.*

<sup>328</sup> *Id.*

<sup>329</sup> *Id.*

programs will continue because it ensures that loans will get repaid.<sup>330</sup> The VRA provides a check on agencies because sometimes an agency will really want a locality to develop a project, but the locality cannot afford to do so.<sup>331</sup> The VRA is efficient because it allows everyone to focus on their area of expertise, and it allows the VRA to become familiar with certain borrowers.<sup>332</sup> To finance resiliency projects, the authority of the VRA could be expanded to issue general obligation bonds; however, this would require that the VRA has taxing authority, which it does not currently have.

## B. Virginia Housing Development Authority

Similarly, the Virginia Housing Development Authority (VHDA) provides an example of a financing authority that could be used as a model to finance coastal resilience efforts.<sup>333</sup> However, this authority is currently limited to financing homeowners.<sup>334</sup> With the VHDA, the state receives capital, disperses the funds to homeowners, and then those who receive funds eventually pay the state back.<sup>335</sup> An advantage of the VHDA is that the VHDA is equipped to issue loans to individual homeowners.<sup>336</sup> To improve resiliency, the VDHA could finance single-family homes through home improvement loans with a resiliency component or through multi-family rehab loans with a resiliency component.<sup>337</sup>

## C. Virginia Small Business Financing Authority

The Virginia Small Business Financing Authority (VSBFA) would likely be the entity that is the best equipped to finance resiliency projects for commercial businesses.<sup>338</sup> To finance resilience projects for commercial businesses, the VSBFA could provide rehab loans with a major resiliency component to businesses.<sup>339</sup> The VSBFA could also issue business loans to resiliency-focused businesses.<sup>340</sup> Local Economic Development Authority bonds would be another possibility for financing resilience projects for commercial businesses in Virginia.<sup>341</sup>

## D. Public Sector Projects

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<sup>330</sup> *Id.*

<sup>331</sup> *Id.*

<sup>332</sup> *Id.*

<sup>333</sup> *About Us*, VA. HOUS. DEV. AUTH., <https://www.vhda.com/about/Pages/AboutUs.aspx#.XP5uMihKiUk> (last visited June 10, 2019).

<sup>334</sup> *Id.*

<sup>335</sup> Telephone Interview with Neal Barber, President, Cmty. Futures (Mar. 1, 2019).

<sup>336</sup> *Id.*

<sup>337</sup> Interview with Neal Barber, President, Cmty. Futures, in Williamsburg, Va. (April 3, 2019).

<sup>338</sup> *Virginia Small Business Financing Authority*, VA. DEP'T OF SMALL BUS. & SUPPLIER DIVERSITY, <https://www.sbsd.virginia.gov/virginia-small-business-financing-authority/> (last visited June 10, 2019).

<sup>339</sup> Interview with Neal Barber, *supra* note 336.

<sup>340</sup> *Id.*

<sup>341</sup> *Id.*

Additionally, financing would need to be secured for public sector projects.<sup>342</sup> The Virginia Department of Transportation (VDOT) is equipped to handle financing through the Virginia Commonwealth Transportation Board.<sup>343</sup> The Board recently authorized funding for the Hampton Roads Bridge-Tunnel (HRBT), which will be “[t]he largest project in VDOT history.”<sup>344</sup> The Board could finance transportation projects through funding sources such as general obligation bonds, trust fund bonds, public-private partnership projects, tolls, and dedicated taxes.<sup>345</sup> Locality owned transportation systems may also be able to fund resilience projects through municipal bonds and public-private partnership projects.<sup>346</sup> Also, transportation districts and authorities may be able to fund resilience projects through revenue bonds and public-private partnerships.<sup>347</sup> Finally, water and sewer, storm water, gas, and solid waste utilities could be used to finance resiliency projects through revenue bonds and general obligation funds.<sup>348</sup> And, public improvements could be funded by local governments through special taxing districts, tax increment financing, general obligation bonds, and revenue bonds from a dedicated revenue source.<sup>349</sup>

## E. Other Options

It is possible that existing revitalization and land conservation focused programs could be implemented in a manner that would also further the Commonwealth’s goals to become more resilient. For example, although the Opportunity Zone Program<sup>350</sup> is meant to help economically distressed communities, it might be able to be used to bolster resilience within the communities it seeks to help in funding resiliency projects.<sup>351</sup> Because this program has already secured some funding, it may be a good source for high priority projects in low-income communities.<sup>352</sup>

Additionally, existing options related to land conservation could be utilized in a manner to facilitate the relocation of homes and businesses out of areas that are at higher risk of flooding. Potential options include voluntary conveyances that provide the property owner with tax benefits, such as conveyances to the Middle Peninsula Chesapeake Bay Public Access Authority;<sup>353</sup>

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<sup>342</sup> *Id.*

<sup>343</sup> Virginia Commonwealth Transportation Board, *Revolutionizing Transportation*, VA. COMMONWEALTH TRANSP. BD., <http://www.ctb.virginia.gov> (last visited June 10, 2019).

<sup>344</sup> Press Release, Off. of the Va. Governor, Governor Northam Announces Comprehensive and Financial Agreements for Hampton Roads Bridge-Tunnel Expansion Project (Apr. 25, 2019), <https://www.governor.virginia.gov/newsroom/all-releases/2019/april/headline-840258-en.html>.

<sup>345</sup> Interview with Neal Barber, *supra* note 336.

<sup>346</sup> *Id.*

<sup>347</sup> *Id.*

<sup>348</sup> *Id.*

<sup>349</sup> *Id.*

<sup>350</sup> The Opportunity Zone Program was “created through the federal *Tax Cuts and Jobs Act* in 2017.” Governor Northam Announces Initiative to Encourage Economic Growth in Virginia’s Opportunity Zones, VA. DEPT. OF HOUS. & DEV. (Apr. 11, 2019), <https://www.dhcd.virginia.gov/governor-northam-announces-initiative-encourage-economic-growth-virginias-opportunity-zones>.

<sup>351</sup> *Id.*

<sup>352</sup> *Id.*

<sup>353</sup> See VA. CODE ANN. § 15.2-6601 (2018).

traditional property acquisition via fee simple purchase or eminent domain;<sup>354</sup> conservation easements;<sup>355</sup> creation of land bank authorities;<sup>356</sup> and implementation of purchase or transfer of development rights programs.<sup>357</sup> The Commonwealth might chose to restructure or expand existing state financing entities or programs to support relocation efforts, or might chose to create a new state authority to undertake that role.<sup>358</sup>

## XI. CONCLUSION

Although the creation of a Coastal Resilience Development Authority may lead to better coordination and serve to house all financing programs under one roof, these benefits can be achieved through less costly means.

First, improving coordination efforts between existing agencies could have the same positive networking effects as a Coastal Resilience Development Authority.<sup>359</sup> Virginia could follow Rhode Island's lead, and the Chief Resiliency Officer could have a designated point person in each agency that coordinates its resilience efforts.<sup>360</sup> The Chief Resiliency Officer could ensure that different agency policies consider resilience as a factor, without creating a central authority.<sup>361</sup>

This setup could be significantly less costly than the development of a Coastal Resilience Development Authority because it would not require hiring new staff members, and it would allow experienced staff members to continue to oversee resilience efforts in areas in which they already have expertise.<sup>362</sup> The state could add resiliency responsibilities to existing duties, and it may not require a lot of additional funding to support the new duties.<sup>363</sup> Massachusetts provides another example of a state that has had success with this setup.<sup>364</sup> Virginia could follow Massachusetts's lead and set forth in its Master Plan different projects which would be controlled by different agencies.<sup>365</sup> This type of organization provides clarity and results in fewer delays because the agencies are already equipped to oversee a project's implementation.<sup>366</sup>

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<sup>354</sup> See *id.* § 55-79.44; *id.* § 55-341.

<sup>355</sup> *Id.* § 64.2-108.

<sup>356</sup> *Id.* § 15.2-7501.

<sup>357</sup> *Id.* § 15.2-2316.2.

<sup>358</sup> See *e.g.*, *How We Work*, VA. OUTDOORS FOUND., <http://www.virginiaoutdoorsfoundation.org/protect/> (last visited June 10, 2019).

<sup>359</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

<sup>360</sup> *Id.*

<sup>361</sup> A local planning department has expressed concern that some funding sources are not set up to consider resilience as a factor. The Chief Resiliency Officer should try to coordinate between funding authorities to ensure that resilience is a factor in projects, even if different authorities are providing the funding. The local planning department also expressed concern about the fact that there is not a requirement to consider inter-jurisdictional flooding in project proposals. A coastal resilience authority could create such a requirement or the Chief Resilience Officer could coordinate between existing agencies to make sure that this occurs.

<sup>362</sup> *Id.*

<sup>363</sup> *Id.*

<sup>364</sup> ST. OF MASS., EXEC. OFF. OF ENERGY & ENVTL. AFF., *supra* note 126.

<sup>365</sup> *Id.*

<sup>366</sup> *Id.*



Second, it might not make the most sense to designate a single entity to be in charge of financing resilience projects.<sup>367</sup> Financial entities often prefer to specialize in providing credit to certain clients, and there would likely be pushback if authorities were asked to fund new types of projects.<sup>368</sup> Virginia could create a Green Bank that would be an entirely new entity that focuses on financing resilience efforts, or it could expand existing programs within existing financing authorities.<sup>369</sup> Either structure could work, but the development of a Green Bank may be the best way for Virginia to get a fresh start on financing resilience efforts.<sup>370</sup>

Virginia has many options for ways in which it can structure financing for its resilience efforts. However, the state may wish to prioritize specific projects in its Master Plan first so that the Commonwealth has a better idea of the type of funding it needs.<sup>371</sup> Then, the state could assess which entities would be best prepared to finance those projects. In addition, this might be helpful to Virginia because local governments have found that it is difficult to get regional agreement in funding individual locality's projects. The key to successful resilience efforts is a holistic approach, and improved coordination and financing options will help the Commonwealth achieve its goals.<sup>372</sup>

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<sup>367</sup> Telephone Interview with Shawn Crumlish, *supra* note 58.

<sup>368</sup> *Id.*

<sup>369</sup> Telephone Interview with Shaun O'Rourke, *supra* note 104.

<sup>370</sup> *Id.*

<sup>371</sup> *Id.*

<sup>372</sup> Telephone Interview with Charles Sutcliffe, *supra* note 21.