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Rising to the Level of Climate Science: Rhode Island, the National Flood Insurance Program, and Sea Level Rise Projections

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Rising to the Level of Climate Science: Rhode Island, the National Flood Insurance Program, and Sea Level Rise Projections

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I. INTRODUCTION

Rhode Island is the smallest state in the United States, but, with over one thousand people per square mile, it has the second highest population density.[1] Homes, businesses, tourism centers, and industrial hubs are primarily located along Rhode Island's over-four hundred miles of coastline, providing breath-taking views, easily accessible beaches, and convenient access to shipping channels; all of these vital economic sectors lie, at least in part, within flood-prone lands.[2] These low-lying areas, especially the coastal areas at an elevation less than 4.9 feet above sea level, are vulnerable to severe coastal storms and coastal flooding.[3] Homes

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1. U.S. Census Bureau, *Resident Population Data: Population Density*, U.S. CENSUS 2010, https://www.census.gov/2010census/data/apportionment-dens-text.php (last visited Mar. 14, 2017). Rhode Island has the fourth highest population density when U.S. territories are included with the states. *Id.*

2. HELEN MANNING, MICHELLE CARNEVALE & PAMELA RUBINOFF, RHODE ISLAND COASTAL PROPERTY GUIDE 2 (2014), http://seagrant.gso.uri.edu/wp-content/uploads/2014/04/Rhode-Island-Coastal-Property-Guide-2014.pdf.

3. *See* R.I. COASTAL RES. MGMT. COUNCIL, NATURAL HAZARDS: HURRICANES, FLOODS, AND SEA LEVEL RISE IN THE METRO BAY REGION SPECIAL AREA MANAGEMENT PLAN 14 (2009), http://sos.ri.gov/documents/archives/regdocs/released/pdf/CRMC/5766.pdf. ("[The] 4.9-foot contour roughly represents the area that would be inundated during spring high water with a 2.3-foot rise in sea level. It appears very probable that such a rise will occur

and businesses in these areas must protect themselves from damages related to flooding, and primarily have one insurance option available: coverage through the federal government's National Flood Insurance Program (NFIP).[4]

The NFIP is administered through the Department of Homeland Security's Federal Emergency Management Agency (FEMA).[5] Established by the National Flood Insurance Act of 1968, the NFIP was created to offer flood insurance to properties with significant flood risk and to reduce the risk of future flooding by incentivizing floodplain management strategies.[6] The NFIP is structured similarly to other risk-based insurance options (e.g., fire insurance, vehicle insurance, etc.) with one key difference: Congress has directed FEMA to heavily subsidize the program for structures that existed before the NFIP was implemented.[7] This is because risk-based premiums are cost-prohibitive to most property owners in the floodplain.[8] This has resulted in the subsidization of over twenty percent of NFIP policies, with an average premium rate of forty to forty-five percent of the actuarial risk-based cost; however, most of these subsidized policies are in the areas most prone to flooding, resulting in low-premium and high-loss claims that have plunged the program into a $23 billion debt to the United States Treasury.[9] As a result of Superstorm Sandy, there was nearly $40 million in claims paid out in Rhode Island;[10] that

within the next 120 years.").

4. *See* National Flood Insurance Act of 1968, 42 U.S.C.A. §§ 4001–4131(Westlaw through Pub. L. No. 114-327); *see generally* JARED T. BROWN, CONG. RESEARCH SERV., R44593, INTRODUCTION TO FEMA'S NATIONAL FLOOD INSURANCE PROGRAM (NFIP*)* (2016).

5. § 4004 (Westlaw).

6. *Id.* § 4001 (Westlaw); BROWN, *supra* note 4, at 1–2.

7. *Reauthorization of the National Flood Insurance Program, Part II: Hearing Before the S. Comm. on Banking, Housing, & Urban Affairs*, 112th Cong. 2 (2011) [hereinafter *Banking, Housing, and Urban Affairs Hearing*] (statement of Orice Williams Brown, Managing Director Financial Markets and Community Investment, Government Accountability Office).

8. *Id.*

9. *Id.*; BROWN, *supra* note 4, at 24.

10. Press Release, Fed. Emergency Mgmt. Agency, Federal Support for Rhode Island Sandy Recovery Exceeds $39.4 Million (June 11, 2013), https://www.fema.gov/news-release/2013/06/11/federal-support-rhode-island-sandy-recovery-exceeds-394-million [hereinafter Press Release, Fed. Emergency Mgmt. Agency R.I. Fed. Support]. Sandy formed on October 22, 2012, in the Atlantic Ocean and moved along Haiti, the Caribbean Islands, and the eastern seaboard of the United States before dissipating on October 31,

amount is a small portion of the over $8.1 billion paid out by the NFIP to all states affected by Sandy, including the two hardest hit states, New York and New Jersey.[11]

This complex interaction between high-risk flood zones and high-loss claims will be exacerbated in the coming decades by climate change.[12] For instance, rising air temperatures lead to warming sea surface temperatures, which, in turn, result in sea level rise and increased frequency of strong coastal storms.[13] Over the last fifty years, sea levels in the northeast have been increasing three to four times faster than the global average, and Rhode Island is preparing for an increase of nine feet above 1990 sea levels by 2100.[14] In addition to this higher base sea level, climate change will lead to stronger coastal storms with higher associated storm

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2012. *See Hurricane Sandy Fast Facts*, CNN, http://www.cnn.com/2013/07/13/world/americas/hurricane-sandy-fast-facts/ (last updated Nov. 2, 2016). During this time, it peaked in strength as a category two hurricane over Haiti then fluctuated between a category one hurricane and a post-tropical cyclone as it moved north, ultimately being referred to as Superstorm Sandy in New England as it weakened from a hurricane before making landfall in New Jersey. *See id.*

11. *The Flood Insurance Claims Process in Communities After Sandy: Lessons Learned and Potential Improvements: Hearing Before the Subcomm. on Housing, Transportation, & Community Development of the S. Comm. on Banking Housing, & Urban Affairs*, 113th Cong. 33 (2014) (statement of Craig Fugate, Admin., Federal Emergency Management Agency, Department of Homeland Security), https://www.gpo.gov/fdsys/pkg/CHRG-113shrg91460/pdf/CHRG-113shrg91460.pdf.

12. *See* Ernest B. Abbott, *Flood Insurance and Climate Change: Rising Sea Levels Challenge the NFIP*, 26 FORDHAM ENVTL. L. REV. 10, 19–20 (2014); AECOM, MICHAEL BAKER JR., INC. & DELOITTE CONSULTING, LLP, THE IMPACT OF CLIMATE CHANGE AND POPULATION GROWTH ON THE NATIONAL FLOOD INSURANCE PROGRAM THROUGH 2100, at 5-1 to -28 (2013), http://www.acclimatise.uk.com/login/uploaded/resources/FEMA_NFIP_report.pdf.

13. John A. Church et al., *Sea Level Change*, *in* CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS: WORKING GROUP I CONTRIBUTION TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 1137, 1150 (Thomas F. Stocker et al. eds., 2013), http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf; P.J. Webster et al., *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment*, 309 SCIENCE 1844, 1845 (2005), http://science.sciencemag.org/content/sci/309/5742/1844.full.pdf.

14. *See* WILLIAM V. SWEET ET AL., GLOBAL AND REGIONAL SEA LEVEL RISE SCENARIOS FOR THE UNITED STATES 1, 9 (2017), https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf; Tim Faulkner, *Ocean State Sea Level-Rise Estimate Now Above 9 Feet*, ECORI NEWS (Feb. 12, 2017), http://www.ecori.org/climate-change/2017/2/12/sea-level-rise-estimate-now-above-9-feet.

surge battering properties from the seaward side and more rainfall flowing into properties from the landward side.[15] All of these factors combined paint a bleak future for the NFIP unless changes are made to fortify the program and better characterize future flood risk.

One of the major concerns in low-lying coastal areas is that the NFIP flood insurance risk maps (FIRMs) are based on historical flooding data and do not take into account sea level rise forecasts from climate-change modeling.[16] Rhode Island has been on the forefront of advocating for the consideration of sea level rise projections into the NFIP maps and policies, but, thus far, FEMA has taken only rudimentary steps to address this suggestion.[17] Rhode Island's Coastal Resources Management Council (CRMC) has spearheaded a large effort to create maps and tools to visualize future flooding risk under different sea level rise scenarios, and remains concerned that not taking these threats seriously could result in liability lawsuits against the state and federal governments;[18] however, options available to Rhode Island to spur federal change are limited.

This Comment explores the complex problem of insuring Rhode Island coastal property in a changing environment. First, it discusses climate change issues that will impact the Rhode Island coast in the coming century, including the resultant threats to coastal populations and infrastructure. Second, it provides an overview of the NFIP, including the creation of FIRMs, recent efforts by Congress to reform the NFIP, and the ineffectiveness of the current 2012 FEMA flood maps for Rhode Island. This Comment also explores suggested flood maps generated by CRMC, innovative ways those maps can be used, including STORMTOOLS,

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15. *See* LEANNA HEFFNER ET AL., CLIMATE CHANGE & RHODE ISLAND'S COASTS: PAST, PRESENT, AND FUTURE 6 (2012), http://seagrant.gso.uri.edu/wp-content/uploads/2014/05/climate_summary.pdf.

16. *See* TECHNICAL MAPPING ADVISORY COUNCIL, FUTURE CONDITIONS RISK ASSESSMENT AND MODELING 1 (2015) [hereinafter TMAC REPORT], https://www.fema.gov/media-library-data/1454954261186-c348aa9b1768298c9eb66f84366f836e/TMAC_2015_Future_Conditions_Risk_Assessment_and_Modeling_Report.pdf.

17. *See, e.g.*, *id.* at 1–27 (providing recommendations to counsel FEMA regarding implementation of sea level rise projections into mapping).

18. *See RI Shoreline Change Special Area Management Plan: STORMTOOLS*, BEACH SAMP [hereinafter STORMTOOLS], http://www.beachsamp.org/stormtools/ (last visited Apr. 7, 2017).

and explains how property owners currently can challenge the validity of FEMA flood maps. Third, this Comment analyzes whether Rhode Island can legally challenge the 2012 FEMA maps based on the argument that the maps do not consider sea level rise projections and, if the 2012 FEMA maps are not updated per Rhode Island's request, the government could be liable for future flood damage resulting from climate change. Fourth, this Comment briefly touches upon ways that Rhode Island could be held liable for permitting decisions based on FIRMs that the state knows are—and openly touts as—inaccurate. Finally, this Comment will conclude that the current legal options available to Rhode Island are limited, but FEMA has taken actions that indicate it is considering how best to maintain the solvency of the NFIP and how to incorporate growing concerns related to sea level rise.

II. BACKGROUND

A. *Climate Change Impacts in Rhode Island*

The verdict is in on climate change: climate change is real, it is occurring at rates that exceed projections, and it is exacerbated by human actions.[19] Greenhouse gases released from the burning of fossil fuels trap heat in our atmosphere, resulting in increasing air temperatures. Global atmospheric temperatures have increased by over 1.5 degrees Fahrenheit since the pre-Industrial era, with each of the last three decades being successively warmer than the last.[20] This increase in air temperature, in turn, has resulted in an increase of nearly 0.8 degrees Fahrenheit in global sea surface temperatures.[21] Air temperatures in New England are expected to increase an additional three to six degrees Fahrenheit by 2080,[22] with associated sea surface temperature increases that

19. *See e.g.,* Naomi Oreskes, *The verdict is in on climate change: When it comes to climate change, open-mindedness is the wrong approach*, L.A. TIMES (Jan. 22, 2012), http://articles.latimes.com/2012/jan/22/opinion/la-oe-oreskes-judging-climate-change-20120122.

20. *See* RAJENDRA K. PACHAURI ET AL., CLIMATE CHANGE 2014 SYNTHESIS REPORT: CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 40 (Keigo Akimoto et al. eds., 2015), http://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC_SynthesisReport.pdf.

21. *Id*. This temperature increase was measured in the upper 250 feet. *Id.*

22. Radley Horton et al., *Northeast*, *in* CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 374 (Jerry M.

will most strongly impact the Northern Hemisphere.[23] Warmer sea surface temperatures then impact Rhode Island in two ways: (1) warmer waters expand in a process called thermal expansion, contributing to sea level rise;[24] and (2) warmer waters serve as fuel for coastal storms, increasing the intensity of tropical storms and hurricanes.[25]

The global sea level has increased by an average rate of 0.7 inches per year in the twentieth century, and, since 1930, Rhode Island has experienced an average sea level rise increase of 0.1 inches per year with a six-inch rise since 1970.[26] The northeast—including Rhode Island—has experienced sea level rise rates three to four times higher than the global average;[27] levels are projected to increase by over nine feet by 2100.[28]

The relationship between warmer sea surface temperatures and tropical storms is more complex than the relationship between warmer sea surface temperatures and sea level rise, but projections have shown that hurricane wind speeds increase by about five percent per every 3.15 degree Fahrenheit increase in sea surface temperatures, resulting in increased storm surge on top of an already rising sea level[29] and up to twenty percent more rainfall

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Melillo et al. eds., 2014). This assumes that greenhouse gas emissions are substantially reduced; if greenhouse gas emissions are not reduced, then there could be an increase of over 4.5 to ten degrees Fahrenheit. *Id.*

23. *See* PACHAURI ET AL., *supra* note 20, at 60.

24. *See, e.g.*, Church et al., *supra* note 13, at 1150–51. Sea level rise is also impacted by the melting of land-based ice sheets and local magnitude of isostatic rebound, which are beyond the scope of this article. *See id.* at 1151–55.

25. *See* Webster et al., *supra* note 13, at 1845–46.

26. *See* HEFFNER ET AL., *supra* note 15, at 7; SEA LEVEL RISE IN RHODE ISLAND: TRENDS AND IMPACTS 2 (2013), http://www.beachsamp.org/wp-content/uploads/2016/09/climate_SLR_factsheet2013.pdf.

27. *See* Asbury H. Sallenger, Jr. et al., *Hotspot of Accelerated Sea-Level Rise on the Atlantic Coast of North America*, 2 NATURE CLIMATE CHANGE 1, 1 (2012), http://www.nature.com/nclimate/journal/v2/n12/full/nclimate1597.html.

28. *See* SWEET ET AL., *supra* note 14, at 23; Faulkner, *supra* note 14.

29. Thomas R. Knutson & Robert E. Tuleya, *Tropical Cyclones and Climate Change: Revisiting Recent Studies at GFDL*, *in* CLIMATE EXTREMES AND SOCIETY 120, 121 (H. F. Diaz & R. J. Murnane eds., 2008) [hereinafter *Tropical Cyclones*]; *see generally* Thomas R. Knutson & Robert E. Tuleya, *Impact of CO^2-Induced Warming on Simulated Hurricane Intensity and Precipitation: Sensitivity to the Choice of Climate Model and Convective Parameterization*, 17 (No. 18) J. OF CLIMATE 3477 (2004) [hereinafter *Impact of CO^2-Induced Warming*].

within sixty miles of the storm center.[30]

All of these factors combine to threaten more Rhode Island infrastructure with more frequent flooding, more intense coastal storms, and heavier precipitation events. This will cause more damage to structures currently in the NFIP flood zone, and will threaten properties with flooding that have historically been beyond the reach of the encroaching waters.

B. *The National Flood Insurance Program*

Recognizing the need for flood insurance and the private insurance market's inability to provide coverage, Congress enacted the National Flood Insurance Act of 1968 (NFIA).[31] This Act authorizes FEMA to offer primary flood insurance to properties with significant flood risk, and to incentivize community action to reduce flood risk through adoption of floodplain management standards.[32] Communities that wish to participate in the NFIP must voluntarily take action to establish and work toward floodplain management standards.[33] At the time of the enactment of this Act and continuing through today, it is not economical for private insurance companies to provide flood insurance to the wide range of individuals in need of protection on affordable terms and conditions.[34] Congress agreed that the federal government would provide flood insurance to those in high-risk areas, and private insurance companies would direct the sale and management of the policies.[35] Currently, all thirty-nine municipalities and one Tribal Nation in Rhode Island participate in the NFIP.[36]

FEMA implements a Risk Mapping, Assessment, and Planning (MAP) process, which facilitates Flood Insurance Studies (FIS) to produce FIRMs.[37] One category in the FIRMs is Special Flood

30. *Tropical Cyclones*, *supra* note 29, at 120, 131.

31. 42 U.S.C.A. § 4001(b)–(c) (Westlaw through Pub. L. No. 114-327); BROWN, *supra* note 4, at 1.

32. *See* § 4001(d) (Westlaw).

33. *See id.* § 4001(e) (Westlaw).

34. *Id.* § 4001(b)(1) (Westlaw); BROWN, *supra* note 4, at 1.

35. *See* BROWN, *supra* note 4, at 11–12.

36. Michelle Burnett, Assistant Chief of Planning, R.I. Emergency Mgmt. Agency, Presentation at the Rhode Island League of Cities and Towns Convention: National Flood Insurance Program; What Changes Are Happening in Rhode Island? 5 (Jan. 30, 2014), http://www.rileague.org/DocumentCenter/View/158.

37. *See id.* at 6, 8.

Hazard Areas (SFHAs), which indicate that an area is exposed to at least a one-in-one-hundred year risk of annual flooding.[38] Within these SFHAs, property owners are required to purchase flood insurance as a condition of receiving a federally-backed mortgage,[39] and it has been estimated that at least seventy-seven percent of all mortgages in the SFHA are subject to the requirement to have flood insurance, whether it is through the NFIP or another provider.[40] In Rhode Island, there are approximately 16,000 structures in the SFHA, and about 9,600 of those have flood insurance covering over $3.8 billion in property; there are over 16,000 flood insurance policies statewide, both in and out of the SFHA.[41]

Congress intended for the NFIP to be actuarial-based, but it recognized that was not feasible given the challenges of implementing a new program on already existing structures in the

38. *See id.* at 4. A one-in-one-hundred year risk of flooding means that each year there is a one percent chance of the property flooding, and flooding in a specific year does not impact the independent chance of flooding in subsequent years. Robert R. Holmes, Jr., *The 100-Year Flood—It's All About Chance*, USGS, https://water.usgs.gov/edu/100yearflood-basic.html (last updated Dec. 9, 2016).

39. Burnett, *supra* note 36, at 9. Lenders that provide federally-backed mortgages includes federal agency lenders, such as the Department of Veterans' Affairs, Federal National Mortgage Associate and Federal Home Loan Mortgage Corporation (Fannie Mae and Freddie Mac, respectively), and federally insured lending institutions, such as all banks covered by the Federal Deposit Insurance Corporation (FDIC). *See Home Loans*, U.S. DEP'T VETERANS AFFAIRS, http://www.benefits.va.gov/homeloans/index.asp (last visited Mar. 17, 2017); *Fannie Mae and Freddie Mac*, FED. HOUS. FIN. AGENCY, https://www.fhfa.gov/SupervisionRegulation/FannieMaeandFreddie Mac/Pages/About-Fannie-Mae-Freddie-Mac.aspx (last visited Mar. 17, 2017); *Bank Data & Statistics*, FED. DEPOSIT INS. CORP., https://www.fdic.gov/bank/statistical/ (last visited Mar. 17, 2017).

40. RICHARD J. TOBIN & CORINNE CALFEE, THE NATIONAL FLOOD INSURANCE PROGRAM'S MANDATORY PURCHASE REQUIREMENT: POLICIES, PROCESSES, AND STAKEHOLDERS 31 (2005), https://www.fema.gov/media-library-data/20130726-1602-20490-9257/nfip_eval_mandatory_purchase_requirement.pdf.

41. R.I. COMM'N TO STUDY ECON. RISK DUE TO FLOODING & SEA RISE, SPECIAL HOUSE COMMISSION TO STUDY ECONOMIC RISK DUE TO FLOODING AND SEA LEVEL RISE: FINAL REPORT 6 (2016), http://www.rilin.state.ri.us/commissions/fsrcomm/commdocs/20160512%20Economic%20Risk%20Due%20to%20Flooding%20and%20Sea%20Level%20Rise%20-%20final.pdf; Burnett, *supra* note 36, at 5. Structures in the SFHA may not have flood insurance for a number of reasons including, but not limited to, not having a federally-backed mortgage either through obtaining private financing or having paid off the mortgage. *Id.* at 4. Structures outside of the SFHA can voluntarily purchase private flood insurance. *Id.*

newly designated SFHA. To that end, Congress directed FEMA not to charge actuarial-based rates for properties constructed before December 31, 1974, or before the date that FEMA published the first FIRM for the community, whichever came later.[42] Given that government-provided flood insurance is not actuarial-based, the NFIP is funded through a combination of premiums on flood insurance policies, annual appropriations from Congress, and by borrowing from the United States Treasury when the NFIP has insufficient funds to cover losses.[43] High rates of subsidy combined with recent natural disasters that resulted in catastrophic losses (i.e., Hurricanes Katrina and Rita on the Gulf Coast and Superstorm Sandy in the Northeast) have led to a $23 billion debt to the United States Treasury, which is perilously close to the $30.425 billion borrowing cap set by Congress.[44] FEMA reported to Congress that "it likely will not generate sufficient revenues to repay the billions of dollars borrowed from the [Treasury]" to cover NFIP claims from recent major storms including Hurricanes Katrina and Rita in 2005, and Superstorm Sandy in 2012, or "potential claims related to future catastrophic losses."[45] FEMA also states that this inability to repay NFIP debt stems from the intentional design of the program to not be actuarially sound, and a return to solvency will take a combination of committed FEMA leadership and congressional action.[46]

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42. 42 U.S.C.A. § 4015(c)(1) (Westlaw through Pub. L. No. 114-327). These "pre-FIRM" structures would move to a full actuarial rate for flood insurance if they were substantially improved at any time after the community adopted FIRM maps, accounting for approximately seventeen percent of all NFIP policies. BROWN, *supra* note 4 at 14. In addition, FEMA allows "grandfathered" properties to maintain their flood insurance class rates even if their property is remapped into a new flood zone, but does not consider it a subsidy even though property owners pay less than actuarial rates. NAT'L RES. COUNCIL OF THE NAT'L ACAD., AFFORDABILITY OF NATIONAL FLOOD INSURANCE PROGRAM PREMIUMS: REPORT 1 43 (2015); NFIP GRANDFATHERING RULES FOR AGENTS 1 (2016), https://www.fema.gov/media-library-data/1488482596393-dcc52e6c120c9327dcd75f1c08e802e4/Grand fatheringForAgents_03_2016.pdf. Sea level rise and increasing storm surge will likely result in more properties being grandfathered, which would further increase the number of policy holders paying less-than-actuarial rates. *See* 44 C.F.R. § pt. 61, app. A(1) (2003), WL 44 CFR § pt.61, app. A(1) .

43. 42 U.S.C.A. § 4017(b) (Westlaw).

44. *Id.* § 4016(a) (Westlaw); BROWN, *supra* note 4, at 24.

45. U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-317, HIGH-RISK SERIES: PROGRESS ON MANY HIGH-RISK AREAS, WHILE SUBSTANTIAL EFFORTS NEEDED ON OTHERS 619 (2017) [hereinafter GAO 2017].

46. *See id.* at 619, 625.

In recent years, more fiscally conservative Congresses have recognized the need to move the NFIP to actuarial-based rates. To that end, the Biggert-Waters Act was passed in 2012.[47] Among other items, the Biggert-Waters Act required that FEMA move the highest-risk policies to actuarial rates in a phased approach, phase out grandfathered policy rates, prohibit subsidized rates on properties purchased after the enactment of the Act, and improve flood risk mapping.[48] Biggert-Waters also required FEMA to form a Technical Mapping Advisory Council (TMAC) that, among other mandates, was required to develop recommendations on how to ensure that FEMA uses the best available science when considering the impact of sea level rise.[49] TMAC released its report in December 2015, and outlined how FEMA should incorporate future conditions as a result of sea level rise into the FIS process, including collaborations with other federal agencies and local communities.[50] The report was submitted to the FEMA Administrator in July 2016 for his consideration, but there is no requirement that FEMA actually adopts the recommendations or includes sea level rise projections in future FISs and FIRMs.[51]

Following the enactment of the Biggert-Waters Act, there was an immediate and vocal outcry from the public as to what actuarial rates would mean for individual pocketbooks, and Congress responded with the Grimm-Waters Homeowner Flood Insurance Affordability Act of 2014 (HFIAA).[52] The HFIAA repealed many portions of Biggert-Waters, returned grandfathered policies to the NFIP, and greatly slowed the move toward actuarial rates.[53]

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47. Pub. L. No. 112-141, 126 Stat. 405 (codified as amended in scattered sections of 42 U.S.C.A. §§ 4001–4131).

48. *See id.* §§ 4012, 4014–4015, 4101a(c) (Westlaw); U.S. GOV'T ACCOUNTABILITY OFF., GAO-16-59, NATIONAL FLOOD INSURANCE PROGRAM: CONTINUED PROGRESS NEEDED TO FULLY ADDRESS PRIOR GAO RECOMMENDATIONS ON RATE-SETTING METHODS 6–7 (2016) [hereinafter GAO 2016].

49. *See* § 4101a. HFIAA did not repeal the TMAC provisions of Biggert-Waters. *See* GAO 2016, *supra* note 48, at 7.

50. *See* TMAC REPORT, *supra* note 16, at 1–27.

51. *Technical Mapping Advisory Council: TMAC Reports and Recommendations*, FEMA, https://www.fema.gov/technical-mapping-advisory-council (last visited Mar. 30, 2017).

52. Homeowner Flood Insurance Affordability Act of 2014, Pub. L. No. 113-89, 128 Stat. 1020 (2014) (codified as amended in scattered sections of 42 U.S.C.A. §§ 4001–4131).

53. *See* GAO 2016, *supra* note 48, at 7.

C. *FEMA Flood Insurance Rate Maps for Rhode Island*

In 2012, FEMA developed new FIRMs for Rhode Island. These maps, developed with community input, must be adopted by communities for its properties to qualify for NFIP-provided flood insurance.[54] Recognizing that errors can persist in FIRMs, FEMA allows individuals and communities to petition for maps to be amended.[55] For example, individuals may claim that they are not required to purchase flood insurance by requesting a Letter of Map Amendment (LOMA) stating that the FIRM did not account for the natural elevation of a property and, when properly taken into consideration, that the property is not in an SFHA.[56] Communities may request a Letter of Map Revision (LOMR) stating that the community has implemented a physical development that resulted in reduced flood risk to areas previously mapped in the floodplain.[57] For both LOMAs and LOMRs, the request to correct a map and FEMA's subsequent decision to do so must be based on scientific information that invalidates the current map; furthermore, in most cases, the cost to request a map change and correct the map is borne by the individual or the community.[58]

After the 2012 FIRMs were published, Rhode Island experts and regulators noticed inaccuracies: the maps miscategorized risk throughout Narragansett Bay by failing to properly account for natural elevation on individual properties or recent flood-reduction projects implemented by communities.[59] Rhode Island believes the

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54. *See* BROWN, *supra* note 4, at 4. After FEMA develops preliminary FIRMs, they present the maps to local officials at Consultation Coordinator Officer (CCO) meetings and to the general public at Open Houses. *The Risk MAP Flood Risk Project Lifestyle: Preliminary FIRM Issuance*, FEMA, https://www.fema.gov/risk-map-flood-risk-project-lifecycle (last visited Mar. 30, 2017). At these meetings, FEMA explains the maps and any changes in flood risk categorization, if applicable. *Id.* Local officials and the general public can provide feedback at this time, but there is no obligation to address the individual concerns. *See id.* After a public notification process, there is a ninety-day comment period for anyone to challenge that the maps are scientifically or technically incorrect, submitting data supporting their stance that will inform revision. *Id.*

55. BROWN, *supra* note 4, at 5.

56. *Id.*

57. *Id.*

58. *Id.*

59. Telephone Interview with Teresa Crean, Coastal Research Assoc., Community Planning and Coastal Resilience (Aug. 11, 2016) [hereinafter Crean Telephone Interview].

FIRMs overestimate flood risk in the Upper Bay and underestimate flood risk along the South Shore and in South County in light of detailed sea level rise projections.[60]

There is no mechanism within the NFIA for a state to challenge the full suite of FIRMs, but FEMA, responding to Rhode Island's concerns, stated that FIRMs are not scientifically or technically inaccurate since the maps must only be based on historical data.[61] Therefore, FIRMs cannot be appealed for failing to account for climate change.[62] Rhode Island looked for formal ways to challenge the FIRMs outside of the NFIA, and filed a request for determination of consistency under the Coastal Zone Management Act in August and October of 2012.[63] To date, the requests have gone unanswered.

D. *FEMA Consideration of Sea Level Rise*

In December 2015, the FEMA TMAC recognized the need to include future conditions risk assessment and modeling in their floodplain mapping, shifting away from the current method of analyzing flood risk as a snapshot in time.[64] As part of this assessment, TMAC recommended providing policy options and information to coastal communities that would include the future effects of long-term erosion and sea level rise.[65] However, FEMA stopped short of requiring communities to adopt FIRMs incorporating sea level rise projections based on the best science available, stating instead that "it is necessary to examine a range of scenarios that reflect . . . plausible future states . . . .

60. *Id.*

61. *Id.*; Patrick Anderson, *CRMC: Federal Flood Maps Flawed*, PROVIDENCE BUS. NEWS (Dec. 9, 2013), http://pbn.com/CRMC-Federal-flood-maps-flawed,93644?print=1.

62. *See* Crean Telephone Interview, *supra* note 59; Anderson, *supra* note 61.

63. Anderson, *supra* note 61. Generally, federal consistency requires that federal actions, within and outside the coastal zone, which have reasonably foreseeable effects [on the coastal zone] be consistent with the enforceable policies of a state's federally-approved coastal management program. Federal actions include federal agency activities, federal license or permit activities, and federal financial assistance activities. *Federal Consistency*, NAT'L OCEANIC & ATMOSPHERIC ADMIN.: OFFICE FOR COASTAL MGMT., https://coast.noaa.gov/czm/consistency/ (last updated Nov. 21, 2016).

64. *See* TMAC REPORT, *supra* note 16, at 1. The TMAC assessment was conducted per the Biggert-Waters Act. *Id.* at 2.

65. *See id.* at 10–15.

Communities should be consulted to determine which scenarios and time horizons to map . . . ."[66] TMAC also recommended supporting demonstration projects to develop future conditions data, evaluating the costs and benefits of different flood risk mapping projections, and serving as informational examples to other communities across the United States.[67]

In October 2016, FEMA announced that it would work with New York City to revise its flood maps following the Mayor de Blasio administration's appeal of the 2015 preliminary FIRMs, which placed 35,000 more homes and buildings in the city into the highest flood risk areas.[68] As part of the agreement, FEMA will produce new preliminary FIRMs that account for climate change projections, including sea level rise and storm surge as guided by the New York City Panel on Climate Change.[69] While New York City has initiated a collaboration with FEMA to consider sea level rise in FIRMs, the path is less clear for the State of Rhode Island.

III. ANALYSIS

First, this Section describes current prohibitions on federal government liability for flood-related damage and provides a potential argument for government liability should that prohibition change. It then suggests an approach for Rhode Island to directly challenge inaccurate FIRMs to establish government liability even though there is an explicit mechanism for states to do so. This Comment then transitions to the potential liability that Rhode Island face for continuing to issue building permits in areas it

66. *Id.* at 14.

67. *Id.* at 22–23.

68. Press Release, Fed. Emergency Mgmt. Agency, Mayor de Blasio and FEMA Announce Plan to Revise NYC's Flood Maps (Oct. 17, 2016) [hereinafter Press Release, Fed. Emergency Mgmt. Agency, NYC Flood Map Revision], https://www.fema.gov/news-release/2016/10/17/mayor-de-blasio-and-fema-announce-plan-revise-nycs-flood-maps. Following Superstorm Sandy, FEMA reevaluated and issued new preliminary FIRMs that increased the number of properties required to purchase flood insurance under the NFIP by enlarging the SFHAs. *See* Evan Lehmann, *New York City, a Climate Change Leader, Challenges Enlarged Flood Maps*, E&E NEWS (Sept. 8, 2015), http://www.eenews.net/stories/1060024322. This led to New York challenging the preliminary FIRMs; as a community, New York City is better positioned to challenge FEMA preliminary FIRMs than the State of Rhode Island. *See id.* (noting New York City's "infinitely valuable" real estate).

69. *See* Press Release, Fed. Emergency Mgmt. Agency, NYC Flood Map Revision, *supra* note 68.

knows to be in SFHA if FIRMs were based on sea level rise projections, and concludes by addressing the ever-present state concern of its action being deemed a government taking.

A. *Federal Government Liability*

Government actions are shielded from liability claims due to sovereign immunity and the discretionary function, as well as acts of God. However, sea level rise may be eroding these protections as scientific sea level rise projections become more sophisticated and accurate. Sea level rise is more accurately described as a projectable environmental change than an act of God, and it is becoming less reasonable to disregard. In absence of these broad protections, FEMA may be susceptible to a negligence claim that FIRMs failed to incorporate sea level rise projects.[70]

1. Liability for Flood Damage Statutorily Prohibited

Federal statutory law categorically states, "[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place . . . ."[71] However, "decisions which impose liability on the United States for damages from flooding [involve] . . . government conduct 'wholly unrelated to any [A]ct of Congress authorizing expenditures of federal funds for flood control, or any act [under]taken pursuant to [any] such authorization.'"[72] This has been interpreted as limiting liability for damages from flooding and constitutes "negligence of the United States unconnected with any congressionally-mandated flood control initiative."[73] Thus, FEMA is not liable for damages from inaccurate FIRMs, since FIRMs are an integral part of a congressionally-mandated flood control initiative.[74]

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70. *See, e.g.*, Jennifer Klein, *Potential Liability of Governments for Failure to Prepare for Climate Change*, COLUM. L. SCH.: SABIN CTR. FOR CLIMATE CHANGE L., Aug. 2015, at 1, 6–14, http://wordpress. ei.columbia.edu/climate-change-law/files/2016/06/Klein-2015-08-Liability-US-Gov-Failure-to-Prep-Climate-Change.pdf (describing elements of a negligence claim needed to hold government liable for refusing to prepare for climate change).

71. 33 U.S.C.A. § 702c (Westlaw through Pub. L. No. 114-316).

72. Fla. E. Coast Ry. Co. v. United States, 519 F.2d 1184, 1191 (5th Cir. 1975) (quoting Peterson v. United States, 367 F.2d 271, 275 (9th Cir. 1966)).

73. Britt v. United States, 515 F. Supp. 1159, 1161 (M.D. Ala. 1981).

74. *See id.*; *see also* Kmart Corp. v. Kroger Co., 963 F. Supp. 2d 605, 622–23 (N.D. Miss. 2013) (city was immune from suit after operating ten-acre landfill for dirt in floodplain adjacent to Kmart store because decision involved

2. Exhibiting Due Care Requires Consideration of Sea Level Rise

Even if there were no statutory prohibition on liability for damages from flooding, or if FIRMs were deemed an exception to this prohibition, sovereign immunity provides a second barrier of protection for federal government actions; however, under the Federal Tort Claims Act (FTCA),[75] sovereign immunity can be waived.[76] One of the broadest exceptions to the FTCA that continues to shield government actions from tort claims is the discretionary immunity function, which states that the FTCA shall not apply to:

> Any claim based upon an act or omission of an employee of the Government, *exercising due care*, in the execution of a statute or regulation, whether or not such statute or regulation be valid, or based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the Government, whether or not the discretion involved be abused.[77]

Commentators have argued that the primary counter to an FTCA argument for discretionary immunity function is that FEMA did not exercise due care when issuing FIRMs based solely on historical data and not incorporating sea level rise projections.[78] For this claim to be successful, the risk of flooding must be so foreseeable as to establish that FEMA owed a duty to the property owner, and that FEMA breached that duty by not including sea level rise projections where a reasonable agency in FEMA's position

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social, economic, or political policy).

75. 28 U.S.C.A. §§ 1346(b), 2671–2680 (Westlaw through Pub. L. No. 113-4).

76. Millbrook v. United States, 133 S. Ct. 1441, 1443 (2013) (quoting Levin v. United States, 133 S. Ct. 1224, 1228 (2013)) ("The FTCA 'was designated primarily to remove the sovereign immunity of the United States from suits in tort.'").

77. § 2680(a) (Westlaw) (emphasis added).

78. *See, e.g.*, James Wilkins, *Is Sea Level Rise "Foreseeable"? Does it Matter?*, 26 J. LAND USE & ENVTL. L. 437, 486–87, 495–96 (2011); *see also* JON KUSLER, FLOOD RISK IN THE COURTS: REDUCING GOVERNMENT LIABILITY WHILE ENCOURAGING GOVERNMENT RESPONSIBILITY v (Sam Riley Medlock ed., 2011) (noting how 100-year flood's failure to consider future conditions and high-risk factors such as high velocity water and erosion contribute to increase in successful common law suits against government).

would have done so to protect against the risk.[79]

This Comment contends that sea level rise *is* foreseeable and related coastal flooding is a hazard that the federal government owes a duty to protect against in the limited context of NFIP-provided flood insurance by incorporating scientifically-sound sea level rise projects in its FIRMs.[80] In recent decades, climate change projections have sufficiently improved to accurately project sea level rise, and each model produces a suite of potential sea level rise scenarios ranging from more likely to occur to least likely to occur. As climate researchers have observed actual sea level rise and compared it to model projections, they see not only that the projections are reasonably accurate, but often observe more sea level rise than anticipated.[81]

To determine whether FEMA breached its duty by not including sea level rise projections in FIRMs and is thereby liable for subsequent damages, consideration of whether FEMA knew or should have known the extent of projected sea level rise in that area and the cost-benefit of taking action should be included.[82] In Rhode Island, it would be nearly impossible for FEMA to claim it did not know and should not have known about the risks that sea level rise poses for coastal properties. This is largely due to Rhode Island's extensive efforts to map sea level rise through STORMTOOLS.[83] STORMTOOLS is an online, interactive mapping tool that allows the user to look at coastal storms of various strengths in combination with two, three, and five feet of sea level rise, allowing visualization of the extent of flooding under different scenarios to the entire Rhode Island coastline down to individual properties.[84] FEMA is aware of this extensive effort, of the diverging risk

79. *See* Maxine Burkett, *Duty and Breach in an Era of Uncertainty: Local Government Liability for Failure to Adapt to Climate Change*, 20 GEO. MASON L. REV. 775, 785–87 (2013) (applying duty and reasonable care analysis against local governments for failing to adequately recognize climate change).

80. *See id.* at 786.

81. *See* Stefan Rahmstorf et al., *Recent Climate Observations Compared to Projections*, 316 SCI. 709, 709 (2007), http://science.sciencemag.org/content/316/5825/709.

82. *See* Burkett, *supra* note 79, at 786–87.

83. STORMTOOLS, *supra* note 18.

84. STORMTOOLS, *supra* note 18; Alex Kuffner, *With online tool, you can see where R.I. would flood*, PROVIDENCE J. (Jan. 1, 2015), http://www.providencejournal.com/news/environment/20150101-unique-online-tool-shows-potential-for-catastrophic-flooding-in-rhode-island-interactive.ece.

assessment between STORMTOOLS and the 2012 FIRMs, and of Rhode Island's goal that future FIRMs will be informed by this model.[85] Given the level of dialogue between the state and federal agencies, it would be unlikely that a court would find that FEMA was not aware of the impact of sea level rise on Rhode Island coasts.

B. *Special Standing for Rhode Island to Challenge FIRMs*

Should the statutory provision prohibiting federal liability for damages caused by flooding fall by the wayside and Rhode Island decide to challenge the agency decision to not include sea level rise projections in FIRMs, then a subsequent obstacle could be Rhode Island establishing standing.[86] Because sea level rise is occurring at a relatively slow rate with noticeable changes only becoming apparent decades in the future, Rhode Island could face obstacles when showing that it suffered a concrete and particularized injury that is either actual or imminent.[87] However, in the landmark decision *Massachusetts v. EPA*, the Supreme Court of the United States held that Massachusetts had standing to challenge an EPA decision not to regulate carbon dioxide as a greenhouse gas, providing potential guidance for a Rhode Island challenge to FIRMs.[88] In *Massachusetts v. EPA*, the Court held that climate change is a concrete injury that is already injuring the local, national, and global environments.[89] Furthermore, Massachusetts had a particularized injury as the landowner of a "substantial portion of the state's coastal property" and that injury did not have to cease completely due to EPA action, but that the slowing of the injury was enough.[90]

Here, the connection between FEMA not considering sea level rise projections when developing and implementing FIRMs is not as straight forward an injury as loss of land due to sea level rise found in *Massachusetts v. EPA*.[91] Nonetheless, this does not mean

85. Crean Telephone Interview, *supra* note 59.

86. *See* Lujan v. Defenders of Wildlife, 504 U.S. 555, 560–61 (1992) (holding that plaintiff must show that it suffered a concrete and particularized injury that is either actual or imminent, the injury is reasonably related to the defendant, and the injury is likely to be redressed by a decision favorable to plaintiff).

87. *Id.*

88. 549 U.S. 497, 525–26 (2007).

89. *Id.* at 517, 521–22.

90. *Id.* at 522, 525–26.

91. *Id.* at 522–23.

that there is not an injury. Rather, by not including sea level rise projections, mandating that communities implement FIRMs could result in municipalities and state permitting agencies making decisions with regard to coastal development that result in increased uninsured losses, and subsequent negative implications for the state economy.[92] Rhode Island, as the only entity that has the authority to issue permits, could be in a unique position with regard to standing, similar to Massachusetts as a substantial landowner in the state.[93] Unlike in *Massachusetts v. EPA*, the injury here is more clearly redressed by FEMA action because it would eliminate the misalignment between FIRMs and scientific information known to Rhode Island, as well as better guide permit decisions, which would reduce future injury.[94]

C. *State and Local Government Liability*

In addition to Rhode Island seeking legal avenues to challenge FEMA regarding FIRMs, the state also could be exposed to liability for permitting construction in SHFAs when it openly contends that the FIRMs are inaccurate. The FTCA only applies to actions taken by the federal government and does not apply to actions taken by the State of Rhode Island, or any of its municipalities.[95] Many states have enacted legislation to protect state government actions from liability in a manner similar to the exclusions to the FTCA; however, Rhode Island is not such a state. In contrast, Rhode Island explicitly waives sovereign immunity for the state and all political subdivisions, making itself liable in tort actions in the same manner as a private individual or corporation.[96] While on its

92. Note that this is an example that has not yet been raised within the courts and is provided as a purely hypothetical illustration as to how an argument may form.

93. *See Massachusetts v. EPA*, 549 U.S. at 522–23; *but see* Pennsylvania v. Nat'l Ass'n of Flood Insurers, 520 F.2d 11, 21–22 (3d Cir. 1975) (holding that the right of a state to sue encompasses suits either brought to protect its proprietary interest or brought to protect "quasi-sovereign" interests, such as the general economy of the state. Furthermore, for such a claim the state must show a direct interest of its own and not merely seek remedies for injury to private parties, who could themselves have prosecuted their own particular claims).

94. *See Massachusetts v. EPA*, 549 U.S. at 521–23.

95. 28 U.S.C.A. §§ 2671–2680 (Westlaw through Pub. L. No. 114-327); *see* Amy M. Hackman, *The Discretionary Function Exception to the Federal Tort Claims Act: How Much is Enough?*, 19 CAMPBELL L. REV. 411, 411–12 (1997).

96. 9 R.I. GEN. LAWS § 9-31-1 (West, Westlaw through 2016 Legis. Sess.)

face this seems to be a liberal policy that opens the state and local governments to a broad range of tort actions, the Rhode Island Supreme Court has not applied such a broad interpretation, but instead has interpreted it in combination with the public duty doctrine to continue to bar many actions against the State.[97]

Over the last several decades, the Rhode Island Supreme Court has applied three significant exceptions to the public duty doctrine, once again opening state and local governments to tort lawsuits:[98] (1) when the duty arose from an activity "that a private person or corporation would be likely to carry out,"[99] (2) "when the state has knowledge that it has created a circumstance that forces an individual into a position of peril and subsequently chooses not to remedy the situation,"[100] and (3) when a plaintiff is owed a duty in his individual capacity.[101]

A lawsuit against the State of Rhode Island for permitting certain activities in an area that is not listed on FEMA's FIRM as a SFHA, but Rhode Island has knowledge is subject to flooding due to sea level rise that would otherwise qualify it as an SFHA, may be allowed under the egregious conduct by the state exception. State courts have not answered this question, but it would be analyzed according to the three-part test described in *Haley*:

> "(1) Did the state create circumstances that forced a reasonably prudent person into a position of extreme peril?
>
> (2) Did the state have actual or constructive knowledge of the perilous circumstances?
>
> (3) Did the state having been afforded a reasonable amount of time to eliminate the dangerous condition, fail to do so?"[102]

(there is a $100,000 cap on recovery under § 9-31-2).

97. *See* Ryan v. R.I. Dep't. of Transp., 420 A.2d 841, 843 (R.I. 1980); Calhoun v. City of Providence, 390 A.2d 350, 356–57 (R.I. 1978).

98. *See generally* Roger Nathaniel LeBoeuf, *The Public Duty Doctrine and the Rhode Island Tort Claims Act*, 43 R.I. B. J. 11 (1995).

99. *See* Delong v. Prudential Prop. & Cas., 583 A.2d 75, 76 (R.I. 1990); O'Brien v. State, 555 A.2d 334, 338 (R.I. 1989); Catone v. Medberry, 555 A.2d 328, 333 (R.I. 1989).

100. *See* Haley v. Town of Lincoln, 611 A.2d 845, 849 (R.I. 1992) (quoting Verity v. Danti, 585 A.2d 65, 67 (R.I. 1991)); Bierman v. Shookster, 590 A.2d 402, 404 (R.I. 1991) (quoting *Verity*, 585 A.2d at 67).

101. *See* Gagnon v. State, 570 A.2d 656, 658–59 (R.I. 1990).

102. LeBoeuf, *supra* note 98, at 16 (citing *Haley*, 611 A.2d at 489).

Under this framework, a state permit for an activity in an area that is not included in a FIRM's SFHA but would have been if FEMA considered sea level rise as suggested by Rhode Island could be subject to liability if flood damage occurs without the option for the property owner to purchase flood insurance through the NFIP.[103] By permitting the action, the reasonably prudent person who sought out a permit is now in a position of peril, the state has actual knowledge of the perilous circumstances, and the state could have eliminated the dangerous condition by not issuing the permit; however, Florida courts have considered a similar argument where a city furnished incorrect FIRMs, resulting in a house that was later declared ineligible for the NFIP.[104] There, the court held that a waiver of sovereign immunity did apply, but that the public duty doctrine precluded the city from liability because the city did not owe a special duty to the individuals who applied for the building permit for their home.[105] However, one commentator has noted that the discretionary decision of the city was whether or not to participate in the NFIP; but once that decision was made, complying with the NFIP requirements was mandatory as there are substantial penalties for non-enforcement, including not being able to continue participation in the primary flood insurance option available to individuals.[106]

D. *Federal Consistency Requirement of the Coastal Zone Management Act*

Even if Rhode Island is not able to directly challenge the methodology FEMA uses to develop FIRMs, it has a powerful legal tool in the Coastal Zone Management Act (CZMA): federal consistency.[107] Under federal consistency requirements, federal agencies issuing federal permits and licenses that are reasonably likely to affect any land or water use, or natural resources of the coastal zone are required to do so in a manner consistent, to the maximum extent practicable, with the state's coastal management program developed and implemented under the CZMA.[108]

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103. *C.f.* Martinelli v. Hopkins, 787 A.2d 1158, 1170 (R.I. 2001).
104. *See e.g.,* City of Tarpon Springs v. Garrigan, 510 So. 2d 1198, 1199–1200 (Fla. Dist. Ct. App. 1987).
105. *Id.* at 1199.
106. *See* Wilkins, *supra* note 78, at 458.
107. 16 U.S.C.A. §§ 1451–1464 (Westlaw through Pub. L. No. 114-327).
108. *Id.* § 1456(c)(3)(A) (Westlaw); R.I. COASTAL RES. MGMT. COUNCIL,

Rhode Island is a CZMA state; the CRMC implements the state's coastal management program, which is colloquially known as the Red Book.[109] The Red Book extensively highlights planning for sea level rise as a state priority; and the CRMC has statutory authority "to develop and adopt policies and regulations necessary to manage the coastal resources of the state and protect life and property from coastal hazards resulting from projected sea level rise and probable increased frequency and intensity of coastal storms due to climate change."[110] Furthermore, a stated CRMC policy is to "review its policies, plans and regulations to proactively plan for and adapt to climate change and sea level rise," and to "integrate climate change and sea level rise scenarios into its programs to prepare Rhode Island for these new, evolving conditions and make our coastal areas more resilient."[111] CRMC's *Federal Consistency Manual* includes a list of activities that are subject to the federal consistency requirement, including, "[r]evisions to Flood Insurance Study and National Flood Insurance maps."[112]

CRMC, through its executive director, expressed in writing to FEMA a request for determination of federal consistency of the 2012 FIRMs with the CRMC Red Book.[113] FEMA's response will dictate the next steps taken by Rhode Island's CRMC.

E. *Takings*

Assuming that Rhode Island is able to successfully challenge FEMA's decision to not include sea level rise projections in FIRMs, or FEMA voluntarily adopts the TMAC recommendations and incorporates sea level rise—neither of which are on the immediate horizon—then Rhode Island and the federal government could face yet another legal hurdle from property owners: violations of the

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COASTAL RESOURCES MANAGEMENT PROGRAM § 400, pp. 1–2 (2012), http://sos.ri.gov/documents/archives/regdocs/released/pdf/CRMC/7823.pdf [hereinafter The Red Book].

109. 46 R.I. GEN. LAWS § 46-23-6(1)(v)(B) (Westlaw through 2016 Legis. Sess.); The Red Book, *supra* note 108, at § 145, p. 5.

110. § 46-23-6(2) (Westlaw).

111. The Red Book, *supra* note 108, at § 145, p. 6.

112. *Id.* § 400, p. 1; R.I. COASTAL RES. MGMT. COUNCIL, FEDERAL CONSISTENCY MANUAL: DIRECT FEDERAL ACTIVITIES 27, http://sos.ri.gov/documents/archives/regdocs/released/pdf/CRMC/CRMC _1059_.pdf.

113. Crean Telephone Interview, *supra* note 59; Anderson, *supra* note 61.

Takings Clause under the Fifth Amendment.[114] The Takings Clause states that the government may not take private property for public use without just compensation.[115] Some have suggested that the elimination of flood insurance subsidies under the NFIP could be a regulatory taking should it result in reduced property value;[116] however, courts have been hesitant to award compensation to private property owners based on the expectation that a subsidy continue.[117]

The Ninth Circuit Court of Appeals, which has authority over complicated and often contentious agreements between private landowners and the federal government as to water allocation rights and water purchase prices, has held that the government's changes to pricing provisions, which reduced the level of subsidy at the time of contract renewal, are permissible even when the policy shift was drastic and likely caused business disruptions that were based on an expectation that the subsidy would continue.[118] Furthermore, the expectation that a subsidy will continue

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114. U.S. CONST. amend. V.

115. *Id.*

116. Sean B. Hecht, *Insurance*, *in* THE LAW OF ADAPTATION TO CLIMATE CHANGE: U.S. AND INTERNATIONAL ASPECTS 511, 518 (Michael B. Gerrard & Katrina Fischer Kuh eds., 2012) ("[A] government requirement for risk-based pricing might conceivably also open up the possibility of takings claims against the government if the requirement were to deprive the land of all economic value to the owner, even though such a requirement would be aimed at restoring the functioning of the insurance market."); John D. Echeverria, *Making Sense of Penn Central*, 23 UCLA J. ENVTL. L. & POL'Y 171, 187 (2005) (noting that the court did, however, highlight several important factors for assessing an alleged regulatory taking: 1) the "economic impact of the government action;" 2) "the extent to which the regulation 'interferes with distinct investment-backed expectations;'" and 3) "the 'character' of the action." Additionally, a "taking" may be found "when the interference with property can be characterized as a physical invasion by government" or, "when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good."); *see also* Benjamin Houston & Noah D. Hall, *Managing Demand for Water*, *in* THE LAW OF ADAPTATION TO CLIMATE CHANGE: U.S. AND INTERNATIONAL ASPECTS 95, 98, 109–11 (Michael B. Gerrard & Katrina Fischer Kuh, eds., 2012) (mentioning increased flooding as one of the attendant problems with water in western states connected with global climate change).

117. *See* Sarah Fox*, This is Adaptation: The Elimination of Subsidies Under the National Flood Insurance Program*, 39 COLUM. J. ENVTL. L. 205, 238 (2014).

118. *See* Madera Irrigation Dist. v. Hancock, 985 F.2d 1397, 1403 (9th Cir. 1993).

indefinitely is not a protected property interest.[119] Therefore, the elimination of flood insurance subsidies through the NFIP that result in a decrease in private property value would not likely be a regulatory taking.[120]

The courts could find that there was a government regulatory taking should the reduction or elimination of flood insurance subsidies result in a total diminution of property value.[121] As regulations that result in total diminution in value are considered per se takings, no balancing of the factors considered in the *Penn Central* analysis is necessary.[122] This is not an unfathomable result of drastic changes to the NFIP's FIRM development process. Homeowners could argue that implementation of actuarial-based rates resulted in not being able to pay flood insurance premiums, which led to subsequent cancellation of their flood insurance policies. Without flood insurance, the homeowners would fail to meet the requirements of their federally-backed mortgage, and thus, would be forced to sell their homes. This in itself may not be enough to constitute a taking, but if the actuarial-based flood insurance essentially drives all potential buyers from the market, then the homeowners could argue that their property has no market value; however, the analysis does not end there. The homeowner would have to go one step further than merely presenting evidence that the market value of the home is completely diminished; the homeowner would have to show that the property has no economic value of any kind for a regulatory taking to have occurred, a showing of which only a few homeowners have been successful.[123] In addition to a high bar to show a complete diminution of all economic value, the state and federal government have no obligation to subsidize flood insurance, so an elimination of the subsidy is unlikely to constitute a taking.[124]

Despite the low likelihood of a court determining that the elimination or reduction of flood insurance subsidies would be a taking in violation of the Fifth Amendment, governments at all

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119. *See* United States v. 42.13 Acres of Land, 73 F.3d 953, 955 (9th Cir. 1996).

120. *See* Fox, *supra* note 117, at 239.

121. *Id.*

122. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1027–32 (1992); *see also* Fox, *supra* note 117, at 239.

123. *See* Richard J. Lazarus, *Lucas Unspun*, 16 SE. ENVTL. L.J. 13, 28 (2007).

124. *See* Fox, *supra* note 117, at 240–41.

levels, particularly state and local governments, are overly cautious when implementing regulatory changes that may raise the specter of takings.[125]

IV. CONCLUSION

Realistically, there are limited legal avenues for the State of Rhode Island to pursue in order to challenge the full suite of FIRMs for state coastal areas that do not incorporate sea level rise projections; there are also limitations on Rhode Island's liability for complying with the FIRMs even when Rhode Island has scientific information that the FIRMS are not accurate. Challenges at both the federal and state levels are prevented by statutory prohibitions on government liability for damages caused by flooding, sovereign immunity, and public policy doctrine, in addition to an aversion to running crosswise with the takings doctrine. There may be a path forward through requiring FIRMs that are consistent with state regulations under the federal consistency clause of the CZMA, which expressly states that preparation for and adaptation to sea level rise is a priority in Rhode Island. There are recent indications from FEMA that it plans to more seriously consider incorporating sea level rise projections into FIRMs, and it recently agreed to work with New York City to do so following Superstorm Sandy.[126]

Rhode Island has compiled and assessed vast data to develop STORMTOOLS to interactively illustrate the impact of sea level rise down to the individual parcel level along the state's coasts. Rhode Island is cutting-edge in regards to embracing climate change projections, particularly sea level rise, due to the relatively large impact on the small state; but there are indications that other states are catching up in their planning strategies. If sea level rise continues to impact coastal communities and strong coastal storms continue to cause substantial damage, Rhode Island is well situated to be the first state to work with FEMA to develop comprehensive FIRMs that incorporate sea level rise.

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125. Justin R. Pidot, *Fees, Expenditures, and the Takings Clause*, 41 ECOLOGY L. Q. 131, 133 n.6 (2014).

126. Joyce Hanson, *Fema to Revise High-Risk Flood Maps After NYC Appeal*, LAW360 (Oct. 18, 2016), https://www.law360.com/articles/852873/fema-to-revise-high-risk-flood-maps-after-nyc-appeal.