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State Hazard Mitigation Plans & Climate Change: Rating the States 2019 Update

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**STATE HAZARD MITIGATION
PLANS & CLIMATE CHANGE:
RATING THE STATES 2019
UPDATE**

By Dena P. Adler & Emma Gosliner

September 2019

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The Sabin Center for Climate Change Law develops legal techniques to fight climate change, trains law students and lawyers in their use, and provides the legal profession and the public with up-to-date resources on key topics in climate law and regulation. It works closely with the scientists at Columbia University's Earth Institute and with a wide range of governmental, non-governmental and academic organizations.

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EXECUTIVE SUMMARY

Between 1980-2019, the U.S. endured 250 climate and weather disasters that each cost more than \$1 billion, resulting in a total cost exceeding \$1.7 trillion. Climate change contributes to a variety of hazards including extreme precipitation, drought, sea level rise, storm surge, heat waves, and flooding, and this effect will worsen over time. While the onset of natural disasters may be unavoidable, forgoing the opportunity to plan for changing conditions and increasing risks puts citizens in the path of preventable danger. Further investing in pre-disaster preparation or other resilience-building activities can save considerable money down the road—and many lives.

The Federal Emergency Management Agency (FEMA) provides technical assistance to states to develop State Hazard Mitigation Plans (SHMPs) which serve as “blueprints” for state efforts to prepare for natural and man-made hazards. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), the Disaster Mitigation Act of 2000, and other legislation set requirements for states to prepare these SHMPs as a condition for receiving certain federal grants to help communities prepare for and recover from future disasters. These plans offer an opportunity for states to integrate future climate projections and informed adaptation actions into their planning for hazard mitigation that can guide efforts across state agencies and applications for future funding. In 2016, FEMA put guidance into effect clarifying its interpretation that its regulations require SHMPs to consider changing future climate conditions (“2016 FEMA Climate Guidance”).

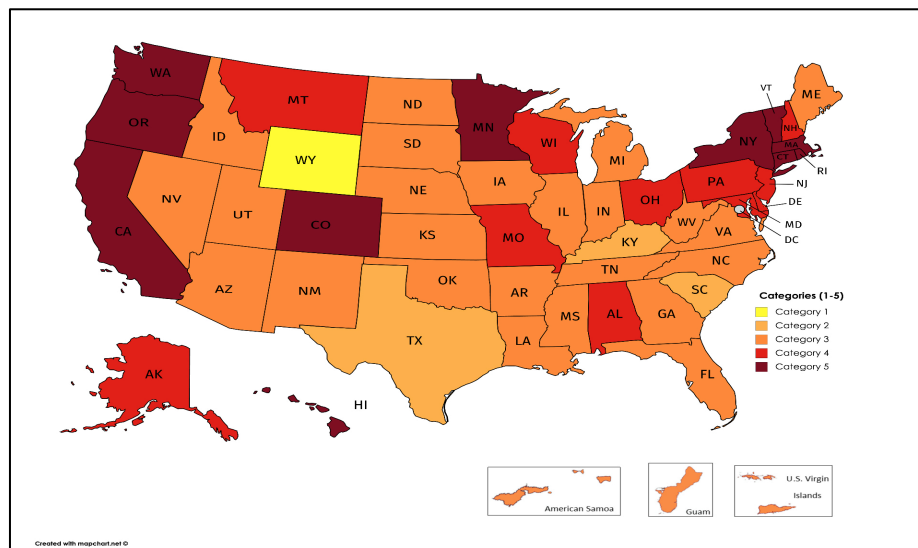
This report analyzes SHMPs issued since 2014 and assesses their compliance with the 2016 FEMA Climate Guidance. The report also ranks the SHMPs into 5 categories, with “1” indicating SHMPs that did not recognize climate change or did so inaccurately and “5” indicating plans with extensive consideration of how climate change will affect hazards, should be integrated across agencies and planning documents, and should be mitigated through adaptation actions. The report updates an earlier Sabin Center report, published in 2013, that ranked the states on their integration of climate change considerations in their then-current

SHMPs (“2013 SHMP Report”). Since 2013 all 50 states have issued new SHMPs. This report therefore analyzes recent SHMPs in all 50 states and three U.S. territories to assess how states have changed their consideration of climate change. This assessment can help track progress in SHMP development, identify states resisting integrating climate change into their risk assessments, and serve as an initial look at whether the 2016 FEMA Climate Guidance is being followed in practice.

Key Findings Include:

- **The Majority of States Now Recognize Climate Change Explicitly in Their SHMPs:** In the 2019 SHMP Report, 49/53 states and territories achieved a category 3 or higher ranking, which means they explicitly recognize and discuss climate change in their plans. In some cases, these discussions are brief and note a need for further development of the issue in future reports, but many consider climate change-related hazards in more detail.

Figure 1: Map of State Hazard Mitigation Plan (SHMP) Climate Change Ranking



The SHMPs are ranked into 5 categories, with “1” indicating SHMPs that did not recognize climate change or did so inaccurately and “5” indicating plans with extensive consideration of how climate change will affect hazards, is integrated into planning, and should be mitigated through adaptation actions.

- **The Majority of States Significantly Improved Their Discussion of Climate Change in Their SHMPs:** Among the 50 states reviewed in both analyses, 39 states improved their consideration of climate change significantly enough to move up the rankings by at least one category. Of the states that moved up the rankings, 18 state plans moved up 1 category, another 17 state plans moved up 2 categories, and 4 state plans moved up 3 categories. Even some states that did not advance to a higher category issued new SHMPs that showed improved consideration of climate change as compared to their previous reports. No states moved down in the rankings.
- **A Few States Still Do Not Recognize Climate Change in Their SHMPs:** Two states still do not use the term “climate change” in their plans: Kentucky (2018) and Texas (2018). Even though states may use other terminology such as “changing conditions” or describe worsening hazard risks without making the explicit link to climate change, it prevents optimal planning to sidestep explicit recognition of the underlying phenomenon which is causing a change in risk levels. Notably, these two plans were both released after the 2016 FEMA Climate Guidance went into effect. Four states ranked as a category 2 or lower with either no or minimal mention of climate change and its impacts (Kentucky, South Carolina, Texas, and Wyoming).
- **Leading States Improved Upon Their Record for Integrating Climate Change into Their SHMPs:** A new category 5 was created in the ranking system to recognize eleven states that had improved their coverage of climate risks, integration of their climate response across different state bodies, and proposals for adaptation actions significantly beyond the baseline category 4 criteria from the 2013 SHMP Report.
- **Improvement Among Landlocked States:** Many landlocked states improved their rankings by acknowledging climate change and its related hazards, contrasting with the 2013 SHMP Report’s observation that many landlocked states ranked as category 1.

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1. INTRODUCTION

Between 1980-2019, the U.S. endured 250 climate and weather disasters that each cost more than \$1 billion resulting in a total cost exceeding \$1.7 trillion.¹ Climate change contributes to a variety of hazards including extreme precipitation, drought, sea level rise, storm surge, heat waves, and flooding among others, and these effects will continue to worsen. While the onset of natural disasters may be unavoidable, forgoing the opportunity to plan for changing conditions and increasing risks puts citizens in the path of preventable danger. Further investing in pre-disaster preparation or other resilience-building activities can save considerable money down the road. The National Institute of Building Standards Multihazard Mitigation Council estimates that the government saves six dollars for every dollar it invests in federal mitigation grants.²

The Federal Emergency Management Agency (FEMA) provides technical assistance to states to develop State Hazard Mitigation Plans (SHMPs) which serve as “blueprints” for state efforts to prepare for natural and man-made hazards. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), the Disaster Mitigation Act of 2000, and other legislation set requirements for states to prepare these SHMPs as a condition for receiving certain federal grants to help communities recover from and prepare for future disasters. These plans offer an opportunity for states to integrate future climate projections and informed adaptation actions into their planning for hazard mitigation that can guide efforts across state agencies and applications for future funding. In 2016, FEMA put guidance into effect clarifying its interpretation that its regulations require SHMPs to consider changing future climate conditions (“2016 FEMA Climate Guidance”).

¹ NOAA, “Billion-Dollar Weather and Climate Disasters: Overview,” available at <https://www.ncdc.noaa.gov/billions/>.

² National Institute of Building Sciences, *Natural Hazard Mitigation Saves: 2017 Interim Report* (2017), available at http://www.wbdg.org/files/pdfs/MS2_2017Interim%20Report.pdf.

In 2013, the Sabin Center issued a report ranking the states on their integration of climate change considerations in their SHMPs. Over the intervening years, all 50 states have issued new SHMPs. This report analyzes recent SHMPs to assess how they have changed their consideration of climate change since the previous report. This assessment can help track progress in SHMP development, identify states resisting integrating climate change into their risk assessments, and serve as an initial look at whether the 2016 FEMA Climate Guidance is being followed in practice.

1.1 State Hazard Mitigation Plans

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000, requires state, tribal, and local governments to develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance.³ These include Hazard Mitigation Grant Program project grants which help fund hazard mitigation measures following a Presidential major disaster declaration and Pre-Disaster Mitigation Grant Program project grants, which states, territories, federally-recognized tribes, and local communities can use to implement sustained natural hazard mitigation programs pre-disaster. Section 322 of the Disaster Mitigation Act of 2000 (42 U.S.C. §5165) additionally specifies that states with approved statewide hazard mitigation plan (SHMP) can receive an increased federal share for certain disaster mitigation funding.

SHMPs are designed to reduce the long-term risk to human life and property from natural hazards. FEMA provides technical assistance and guidance to states in preparing their plans and also reviews and approves all plans, which must be updated every five years. FEMA regulations specify that the SHMPs should demonstrate “the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources

³ 42 U.S.C. 5121 et seq.

to reducing the effects of natural hazards.”⁴ Plan requirements include a description of the planning process, a risk assessment, a mitigation strategy, a section on coordination of local mitigation planning, and a plan maintenance process. The risk assessment must include an “overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events... [and] probability of future hazard events;” an analysis of the State's vulnerability to the identified hazards, and an analysis of potential losses to the identified vulnerable structures.⁵ Additional regulations provide requirements for states wishing to develop an “Enhanced State Mitigation Plan” which at the time of a disaster declaration renders a state eligible to receive increased funds.⁶

A state’s mitigation strategy is intended to serve as its “blueprint” for minimizing the losses described in the risk assessment.⁷ As climate change worsens the extent, probability, and frequency of a variety of hazards facing states the integration of climate change considerations into SHMPs enables this blueprint to reflect states’ changing vulnerability, prepare with mitigation strategies that reflect changing conditions, and seek support from FEMA in addressing these challenges.

In October 2018, Congress passed and President Trump signed H.R. 302, the FAA Reauthorization Act of 2018, which contains the Disaster Recovery Reform Act (DRRA). The DRRA contains a provision renaming the “Predisaster Hazard Mitigation” program as the “National Public Infrastructure Predisaster Hazard Mitigation Grant Program” and enables the allocation of additional resources to predisaster federal grant spending.⁸ While this investment remains only a small fraction of the total resources spent on federal disaster-related grants and only permits that this additional allocation *may* be used for predisaster spending, it does

⁴ 44 C.F.R. § 201.4.

⁵ *Id.*

⁶ 44 CFR § 201.5.

⁷ 44 CFR § 201.4 .

⁸ FAA Reauthorization Act of 2018, H.R. 302, 116th Congress § 1234 “National Public Infrastructure Predisaster Hazard Mitigation” (2018).

authorize this funding to be additional to other disaster spending and represent a recognition of the increasing importance of funding efforts to increase resilience before a disaster strikes.⁹

1.2 FEMA Guidance on Considering Climate Change in SHMPs

In March 2016, FEMA put into effect a State Mitigation Plan Review Guide (“2016 FEMA SHMP Guide”) with information pertinent to how states must consider climate change in their SHMPs. Overall, the 2016 FEMA SHMP Guide provides FEMA’s official policy on and interpretation of the federal regulations for natural hazard mitigation planning.¹⁰ This includes FEMA’s interpretation on the extent to which States must consider how changing future conditions, development patterns, and population demographics will affect a state’s future risks and vulnerability. One of the document’s guiding principles is “reducing risks” and under this umbrella FEMA specifies that “State risk assessments must be current, relevant, and include new hazard data, such as recent events, current probability data, loss estimation models, or new flood studies...and *consideration of changing environmental or climate conditions that may affect and influence the long-term vulnerability from hazards in the state.*” (emphasis added).¹¹ FEMA interprets the regulations to require a consideration of future probability of future hazard events as part of the risk assessment and notes that climate change could “significantly alter the types and magnitudes of hazards impacting states in the future.”¹² This report refers to the climate-related content of the 2016 FEMA SHMP Guide as the “2016 FEMA Climate Guidance.”

⁹ Sierra Killian and Rebecca L. Kihlsinger, “Before Disaster Strikes: Pre-Disaster Mitigation Funding,” (Nov. 28, 2018), Environmental Law Institute Blog, available at <https://www.eli.org/vibrant-environment-blog/disaster-strikes-pre-disaster-mitigation-funding>.

¹⁰ FEMA, State Mitigation Plan Review Guide 1 (2015), FP 302-094-2, available at https://www.fema.gov/media-library-data/1425915308555-aba3a873bc5f1140f7320d1ebeb18c6/State_Mitigation_Plan_Review_Guide_2015.pdf. (Hereafter “2016 FEMA SHMP Guide.”)

¹¹ *Id.* at 3

¹² *Id.* at 13 (“The mitigation planning regulation (44 CFR Part 201) requires consideration of the probability of future hazard events as part of the risk assessment in order to reduce risks and potential damage...the challenges posed by climate change, such as more intense storms, frequent heavy

The 2016 FEMA SHMP Guide offers an important clarification of states' responsibility to issue forward-looking SHMPs that consider changing conditions, and do not simply estimate future hazard probabilities based on past events. The general nature of the guidance allows for a great deal of flexibility in how states interpret and implement the requirement (a fact made apparent in the post-2016 SHMPs reviewed for this report). The guidance does not specify any requirement to acknowledge "climate change" per se, allowing the possibility that states may describe changing conditions using other language—which some states have elected to do. However, it is difficult to understand how states could adequately consider future conditions without fully accounting for how climate change as a phenomenon will shift future probabilities of hazard occurrence and intensity. Several states—Alabama, Arizona, Georgia, Iowa, Mississippi, and Wisconsin—reference this new guidance in their updated plans and how they addressed the new policies. Even among these states, however, there exists a large degree of variation in the consideration of changing climate conditions and the quality, quantity, and currentness of the climate science underlying the plans.

FEMA further clarifies that the goals for a state's mitigation strategy "must be consistent with the hazards and vulnerabilities identified in the risk assessment" and the plan "must identify actions based on the current risk assessment to reduce the vulnerability of jurisdictions within the state as well as the vulnerability of state owned or operated buildings, infrastructure, and critical facilities."¹³ If states have identified climate change effects in their risk assessments—which, as discussed above, is required by the guidance—then this language indicates a further requirement to integrate climate change into mitigation strategies and adaptation actions. Thus, to be compliant with the guidance a state should integrate climate change into not only its risk assessment, but also its mitigation strategy and adaptation actions. However, there could be considerable variability in interpreting the degree to which that

precipitation, heat waves, drought, extreme flooding, and higher sea levels, could significantly alter the types and magnitudes of hazards impacting states in the future.").

¹³ 2016 FEMA SHMP Guide at 18.

integration must occur. This guidance 2016 FEMA SHMP Guide will be referred to as the “2016 FEMA Climate Guidance.”

Since publication of the 2016 FEMA SHMP Guide, FEMA, under the Trump Administration, has removed all mention of climate change from its Strategic Plan.¹⁴ As of publication, the 2016 FEMA Climate Guidance remains in place and has not been removed from the FEMA website.

1.3 Purpose of this Survey

In 2013, the Sabin Center for Climate Change Law published a previous review of SHMPs and their consideration of climate change (“2013 SHMP Report”).¹⁵ At the time of publication of the 2013 SHMP Report, FEMA had not yet released guidance to states clarifying a requirement to include analysis of climate change in their State Hazard Mitigation Plans. The 2013 SHMP Report analyzed how state plans issued between 2010-2013 discussed, or failed to discuss, climate change or changing climate conditions more generally. The results of the 2013 SHMP survey indicated that coastal states were more likely to include discussion of climate change due to the immediate threat of sea level rise and coastal storms and hazards.

The purpose of this 2019 SHMP Report is to survey and determine the extent that climate change is incorporated into SHMPs since that earlier report and issuance of 2016 SHMP FEMA Guide, as well as begin to identify which states have adequately addressed climate change adaptation and mitigation. The 2013 SHMP report provides a baseline of comparison for this subsequent 2019 analysis of plans issued since 2013, particularly in light of the 2016 FEMA SHMP Guide.

¹⁴ See FEMA, Strategic Plan: 2018-2022, available at https://www.fema.gov/media-library-data/1533052524696-b5137201a4614ade5e0129ef01cbf661/strat_plan.pdf.

¹⁵ Matt Babcock, *State Hazard Mitigation Plans & Climate Change: Rating the States* (2013), The Sabin Center for Climate Change Law, available at <http://wordpress.ei.columbia.edu/climate-change-law/files/2016/06/Babcock-2013-11-State-Hazard-Mitigation-and-Climate-Change.pdf>.

2. METHODOLOGY

This report collected SHMPs from all 50 states and three U.S. territories (American Samoa, Guam, and U.S. Virgin Islands). Washington D.C. and other U.S. territories were not considered in this analysis. SHMPs were accessed on the relevant state agency’s website or otherwise obtained by contacting a representative of the state agency. This report analyzed the most recent plan available from each state ranging from 2014 (before the 2016 FEMA Climate Guidance) to 2019 (See Table 1). States with SHMPs from 2014 are expected to update their plans in 2019. In some cases, we were able to obtain updated 2019 plans prior to our cut-off date of June 1, 2019 and in those instances we utilized the 2019 plans. In some cases we reviewed “draft” plans for the analysis, but only under the circumstances in which these “draft” plans were final versions of the plan submitted by the state agency to FEMA for approval with no further changes expected. In these cases, the “draft” status was not reflective of the plan still being in progress, but of the plan’s status as not yet approved by FEMA. Once approved by FEMA and signed by the Governor, plans are officially considered finalized and posted online as an approved plan. Each state has different requirements, such as providing a period for public comment while others do not need to make the draft public until it is finalized and sent to FEMA for approval.

Table 1: Dates of Plans Reviewed for the Analysis

| Year | Number of Plans | States |
|------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014 | 4 | Guam, Nebraska, South Dakota, U.S. Virgin Islands |
| 2015 | 2 | American Samoa, Oregon |
| 2016 | 2 | Maryland, Wyoming |
| 2017 | 1 | Wisconsin* |
| 2018 | 34 | Alabama, Alaska, Arizona, Arkansas, California, Colorado, Delaware, Florida, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia |
| 2019 | 10 | Connecticut, Georgia, Indiana, Louisiana, New Jersey, New York, Ohio, Oklahoma, Rhode Island, Utah |

*Wisconsin released its plan in 2016, but amended the plan in 2017 in light of the 2016 FEMA Climate Guidance.

Information from the plans was organized into a spreadsheet following the format described in the 2013 SHMP Report. This spreadsheet includes administrative information including: plan date, authoring agency, and information on where the plan can be located (usually a weblink). More substantively, the spreadsheet includes a list of hazards addressed in the plan, indication of which hazards include information related to climate change and whether that information is quantitative or qualitative, description of the extent to which climate change is discussed in the plan in a manner that contributes to understanding of the risk, whether discussion explicitly or implicitly references “climate change,” and information on whether climate change is integrated into mitigation strategies or adaptation actions. To determine the extent to which climate change was discussed in a manner that contributes to an understanding of the risk, a key word search was conducted using relevant terms from the 2013 SHMP Report (e.g., climate change, global warming, sea level rise, changing hydrologic

conditions).¹⁶ The risk assessment sections related to hazards that may be affected by climate change were also reviewed in case the discussion used other terms.

The SHMPs were assigned into five broad categories based on how extensive a discussion of climate change was included in the plan. The ranking categories 1 through 4 are based on the original criteria from the 2013 SHMP Report with a few tweaks and clarifications to accommodate the overall upward trend in quality of the SHMPs while still differentiating between the quality of respective HMPs. Additional language used to clarify and distinguish these categories beyond what was identified in the original 2013 SHMP Report's table was extrapolated from further description of the rankings in the written analysis of the 2013 SHMP Report.

Categories 1 and 2 set a low baseline which was held constant so that states would not appear to backslide in their ranking when in fact their more recent reports were typically an improvement over their past reports. The bulk of plans fell into categories 3 and 4. While some SHMPs met only the minimal requirements of a category 3 identified in the 2013 SHMP Report, the recent body of plans ranged widely in how they covered climate change. Sometimes this coverage was quite extensive while still remaining primarily qualitative and falling short of integrating climate concerns into mitigation strategies and adaptation actions. Accordingly, the lower floor of a category 3 was held constant, but a category 3 came to encompass this wide range of SHMPs with primarily qualitative coverage of climate change risks.

A category 4 status was used to distinguish plans that involved a greater amount of quantitative climate hazard-related information, integration of climate change into mitigation strategies and adaptation actions, and/or description of how climate change concerns were coordinated across state agencies and other state or local plans. An additional ranking category 5 was created to help distinguish states that met the category 4 criteria and went beyond it in a significant way through the inclusion of more granular data, further reflection of coordination

¹⁶ Additional search terms used in this analysis were climate variability, change in climate, future climate conditions, severity, and exacerbate.

of climate concerns and actions across different organizations and assessments, reflection of climate change as a primary purpose or goal of the report, and/or more extensive integration of climate change into mitigation strategies and adaptation actions. (See Table 2 on page 12 in the Analysis Section for a short description of each category.)

This ranking system provides a useful quick assessment and jumping off point for further analysis of how climate change has been integrated into SHMPs since the 2016 FEMA Climate Guidance was issued. Given the large degree in variability in how states organize information for the SHMPs and what information they include, there were many gradations in climate coverage which were sorted as best as possible into the five broad categories. One particular instance where close calls had to be made included the differentiation between category 3 and 4. In some cases a category 3 might have an even more extensive coverage of climate change hazards than a category 4, but would remain a category 3 because it had limited quantitative information or poor integration into tangible mitigation strategies or adaptation actions. Conversely, to achieve a higher ranking states also needed to be explicit in identifying climate change as affecting hazards. A state that prepares a heat wave action plan may be preparing for higher global temperatures, but it is impossible to know unless the plan states so explicitly. States that included the multiple prongs of hazard discussion, quantitative data, and integration into mitigation strategies were most likely to be tipped into a higher rating even if the coverage of each of these individual factors might be less extensive. For an example of a more formalized ranking system applied to local hazard mitigation plans and description of several other systems for reviewing hazard mitigation plans see Berke, Lyles, and Smith, (2014).¹⁷

¹⁷ Lyles W, Berke P and Smith G, *A Comparison of Local Hazard Mitigation Plan Quality in Six States, USA*, 122 LANDSCAPE AND URBAN PLANNING 2014, at 89–99.

3. ANALYSIS

Since the 2013 SHMP Report, states have greatly improved their consideration of climate change in their SHMPs. No states moved down a ranking category and the majority of states moved up by at least one, and many by two or more, categories. Even some states which maintained the same ranking over time issued new plans with improved considerations of climate change—just insufficient improvements to bump them up to the next category. Further, several of the highest-ranking states in 2013 SHMP Report improved upon their previous reports significantly, prompting creation of an additional category 5. This analysis has two parts. First, this section provides an overview of trends by assessing the distribution of SHMPs across the categories, changes to that distribution since the previous report, and the nature of the SHMPs’ discussions of climate change, climate-affected hazards, and climate change-related mitigation activities. Second, this section discusses each category in greater detail to highlight the nature of the SHMPs within each category.

3.1 Updated Category Designations

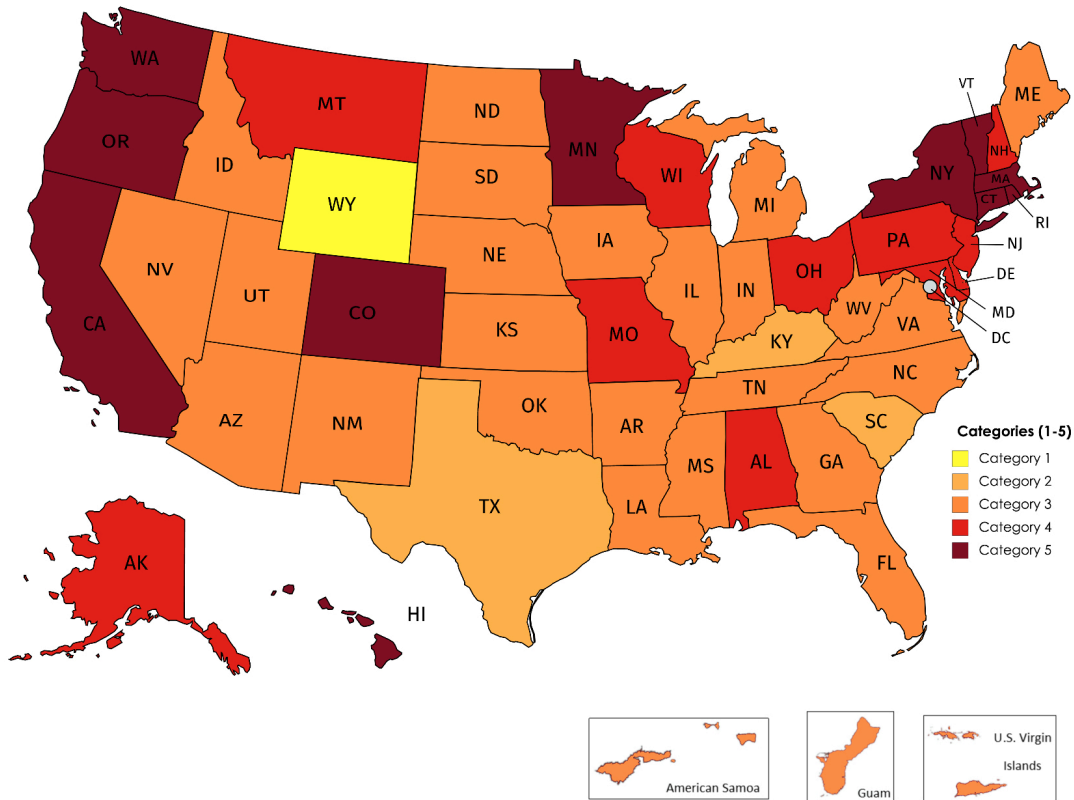
The majority of states achieved a category 3 or higher ranking for their SHMP, meaning that at a minimum, they discussed climate change explicitly as a hazard or factor influencing hazards and included a significant discussion of climate change or a briefer discussion with indication of the need to expand the discussion in a future report. Only four states ranked as a category two or lower in the 2019 SHMP Report. The inclusion of a new category 5 demonstrates that SHMPs for a number of states have improved beyond the best SHMPs from the 2013 SHMP Report. Many landlocked states improved their rankings by acknowledging climate change and its related hazards, contrasting with the observation from the 2013 SHMP that many category 1 states were landlocked.

Table 2 identifies the number of states ranked in each category and which states fell into each category. The year of the plan analyzed is included to help identify how the SHMPs are, or aren’t, improving over time as discussed in greater detail below.

Table 2: State Ranking of Hazard Mitigation Plans with Description of Ranking Categories

| Category | Ranking Description | Number of States in Category | States in Category (SHMP Year Designated) |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | No discussion of climate change or inaccurate discussion of climate change | 1 | 2016: WY |
| 2 | Minimal mention of climate change-related issues and may not discuss “climate change” by name | 4 | 2018: KY, SC, TX |
| 3 | Significant discussion of climate change but typically more qualitative in nature without significant integration into mitigation strategies or adaptation actions and/or briefer discussion with acknowledgement of need for future development | 27 | 2014: American Samoa, Guam, IN, NE, OK, SD, U.S. Virgin Islands 2018: AR, AZ, FL, ID, IL, IA, KS, ME, MS, NM, NV, NC, ND, VA, WV, TN 2019: GA, LA, MI, UT |
| 4 | Thorough discussion of climate change impacts on hazards with more inclusion of quantitative information and at least some integration into planning, mitigation strategies, and/or adaptation actions | 11 | 2015: MD 2017: WI 2018: AK, AL, DE, MO, MT, NH, PA 2019: OH, NJ |
| 5 | An additional category to reflect recent plans that have more extensively integrated climate change and/or climate adaptation into the purpose, strategy, or actions associated with the SHMPs; Some plans have lesser degree of integration, but it is combined with more localized or detailed data on climate change hazards | 11 | 2015: OR 2018: CA, CO, HI, MA, MN, VT, WA 2019: CT, NY, RI |

Figure 1: Map of State Hazard Mitigation Plan (SHMP) Climate Change Ranking



Created with mapchart.net ©

The SHMPs are ranked into 5 categories, with “1” indicating SHMPs that did not recognize climate change or did so inaccurately and “5” indicating plans with extensive consideration of how climate change will affect hazards, should be integrated across agencies and planning documents, and should be mitigated through adaptation actions.

3.2 Movement within the Rankings

The SHMPs display a clear upwards trend toward higher quality in their inclusion of climate change. Of the 50 plans analyzed in the 2013 SHMP Report, 39 state plans moved up the rankings, improving their inclusion of climate change, and three new plans were incorporated into the analysis (American Samoa, Guam, and U.S. Virgin Islands). Out of the 39 plans that moved up the ranking categories, 36 were released in 2017 or later—after the 2016 FEMA

Climate Guidance went into effect (though it was published in 2015). Three plans were updated in or prior to 2016.¹⁸ One of the most notable changes is the decline in category 1 SHMPs (which include either no or inaccurate discussion of climate change) from 18 to 1. Another large change is the increase in category 3 SHMPs from 10 to 27. Additionally, 11 states achieved the new category 5 ranking for a higher standard of climate change coverage and integration into the SHMP.

Table 3: Comparing the Number of Plans in Each Ranking Category in the 2013 SHMP Report and the 2019 Update Report

| Category | Number of Plans in Ranking Category (2013 SHMP Report) | Number of Plans in Ranking Category (2019 Update) |
|----------|--------------------------------------------------------|---------------------------------------------------|
| 1 | 18 | 1 |
| 2 | 11 | 3 |
| 3 | 10 | 27 |
| 4 | 11 | 11 |
| 5 | -- | 11 |

** It should be noted that the 2019 update analyzes 53 plans in contrast to the 50 plans analyzed in 2013, accounting for part of the increase in category 3 plans.*

Among the 39 states that moved up the rankings, 18 state plans moved up one category, another 17 state plans moved up two categories, and 4 state plans moved up three categories. The improvement of 20+ states by two categories indicates significant improvement for individual states, not only the body of plans as a whole. Even among states that remained at the same ranking, there were often improvements in inclusion of climate change between one plan and the next.

It is difficult to attribute the upward movement specifically to the 2016 FEMA Climate Guidance requirements as many states have grown more concerned about climate change over

¹⁸ A number of states released SHMPs in 2013-2014 between the plans reviewed for the 2013 SHMP Report and those reviewed for the 2019 SHMP Report. Reviewing those plans might help determine if the improved focus on climate change in SHMPs occurred before or after the 2016 FEMA Climate Guidance was issued.

recent years. However, many SHMPs noted the guidance requirement to consider changing and future climate considerations. While the influence of the guidance may vary from state to state, the guidance may serve at least two functions to motivate further consideration of a changing climate. First, it can motivate the prioritization of climate change coverage in an environment of scarce resources or competing issue areas. Second, the guidance could potentially motivate holdout states that do not prioritize climate change as an issue of concern. Additionally, in states where the issue of climate change has grown politicized to a degree that agencies are cautious in their coverage of the issue it may provide some degree of political cover.

Although 39 state plans moved up in category rankings, 11 state plans remained in the same category from 2013 SHMP Report. However, many of the states that did not move up the rankings still improved upon their incorporation of climate change into their SHMP above what was issued in previous plans. Additionally, some of the states that remained in the same category already had some substantive consideration of climate change earning a ranking of category 3 or higher (AK, FL, ME, MD, MI, NH, NJ, NC, WV). Notably, two states that did not move up the rankings, Texas and South Carolina, issued reports in 2018 that still ranked in only category 2 even though the 2016 FEMA Climate Guidance went into effect in 2016 (and was published in 2015). Wyoming did not move up the rankings and earned a ranking of category 1 even though it released its report in 2016.

3.3 Climate Change Coverage Across the SHMPs

Different states took different strategies to include climate change in their SHMPs. Some states address climate change within each relevant hazard profile, other states designate climate change as its own hazard profile, and some states put climate change into its own separate section rather than within the description of hazards. Some states, such as Alabama and Colorado, discuss the future probability of each hazard in relation to climate change and even identified regions of the state most vulnerable to each hazard. In 2019, New York issued an

interactive website version of its SHMP which integrates climate change data and actions across its many sections.

A large degree of variability continues to exist between states in the quality of their consideration of climate change in SHMPs and some states continue to have very low quality inclusion of climate change in their SHMPs. As discussed above, the majority of states have significant coverage of climate change in their SHMPs, but two states still do not use the term “climate change” anywhere in their plans: Kentucky (2018) and Texas (2018). The 2018 Texas plan does not have a dedicated section to “climate change,” but it does have a short section on “changing future conditions,” that notes climate change-related information, including expectations for more days of extreme heat, changes to sea level that will result in worse storm surge and greater damage, and a pattern of increasing average hurricane intensity combined with sea level changes that will contribute to worsening expected damage from hurricanes. While it is possible for an SHMP to prepare for climate impacts such as sea level rise and increased flooding without acknowledging that these phenomena are due to global climate change—at least to a certain extent—that omission reduces clarity that may cause an underestimation of risks and related hazards (e.g. an underestimation of the rate of sea level rise or the extent of future flooding). When the decision to not mention the words “climate change” explicitly in an SHMP is due to the political situation in a specific state rather than an absence of knowledge at the agency level, it is possible that the agency may be addressing the issue, but the lack of explicit discussion in the SHMP forecloses an important opportunity to work climate considerations into the state hazard “blueprint.”

Even some states that explicitly recognize climate change underplay its risks. For example, Mississippi ranked climate change as its hazard of lowest concern and priority among the 10 hazards profiled in its SHMP and indicated that climate change will have little to no impact on the state. In contrast, other states stress climate change as a high-level priority in their SHMPs. Massachusetts even restructured and retitled their plan as a “State Hazard Mitigation and Climate Adaptation Plan.” Other states have integrated new forward-looking concerns into

their SHMPs. For example, Vermont considers “climate refugees” in its plan. Other states discuss supporting localities in integrating climate change into their plans and specific actions to reduce and mitigate risk related to climate change.

3.4 Natural Hazards Affected by Climate Change

Climate change will affect each state in a variety of ways, exacerbating and changing risks associated with a wide array of natural and man-made hazards. Climate change is specifically mentioned and discussed in more than 50 hazard profiles, including:

Natural Hazards:

Algal Blooms, Air Pollution, Aquatic Invasive Species, Animal Disease, Avalanches, Climate Change, Coastal Erosion and Bluff Failure, Coastal Flooding, Crop Failure, Dam Failure, Drought, Earthquake, Erosion, Extreme Temperatures, Flooding, Fishing Failure, Fissure, Ground Failure, Hail, Heavy Precipitation, High Surf, High Winds, Hurricanes, Infectious Disease (Epidemic/Pandemic/Vector-Borne Disease), Invasive Species, Insect Pests and Disease, Levee Failure, Tornadoes, Windstorms, Landslides, Lightning, Sea Level Rise and Coastal Land Change, Nor'easter, Sinkholes, Land Subsidence, Tsunamis, Wildfires, Winter Storms, Soil Hazards/Geological Events (Expansion, Subsidence, Sinkholes/Karst), Seiche, Volcano, Community Fire Conflagration, Tropical Cyclone, Water Shortage, Tree Mortality, Wildlife-Vehicle Collision, and Urban/Structural Fire.

Non-Natural Hazards:

Energy Shortage, Power/Utility Failure, Transportation Infrastructure, Disruption of Life Lines, Cyber Disruption, Hazardous Materials, and Radiological.

It should be recognized that some states made a practice of analyzing climate change in regard to each hazard in the plan and in certain cases that resulted in hazard profiles mentioning climate change only to note it would not have a significant impact on that hazard.

3.5 Climate Mitigation Actions

One of the required components of SHMPs includes a mitigation strategy with goals to reduce and avoid long-term vulnerabilities from the identified hazards.¹⁹ Of the 53 plans reviewed, more than half contained specific mitigation actions and objectives related to climate change adaptation and resiliency. Below is a table showcasing the variety of strategy and mitigation actions states will use to address climate change.

Table 4: Specific Mitigation Actions and Objectives Relating to Climate Change in SHMPs

| State | Date | Climate Mitigation Actions/Objectives |
|----------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alaska | 2018 | <ul style="list-style-type: none"> Better define or determine future potential statewide climate change impacts |
| American Samoa | 2015 | <ul style="list-style-type: none"> Education programs to increase awareness and mitigation impacts of climate change on island environments Local monitoring and hazard mapping programs Continue to implement and expand actions in Executive Order 010A-207 which focuses on reducing climate change impacts |
| Arizona | 2018 | <ul style="list-style-type: none"> Of high priority to promote and disseminate climate change research and workshop information and data to state agencies, local, county, and tribal jurisdictions in order to enable all parties to prepare for the potential future conditions of the state |
| California | 2018 | <ul style="list-style-type: none"> Acknowledge, incorporate, and integrate recognized data on climate change impacts on hazards, risks, and vulnerabilities available from credible scientific sources into state, local, tribal, and private sector mitigation plans, strategies, and actions |

¹⁹ 2016 FEMA SHMP Guide at 18. *See also* 44 C.F.R. § 201.4(c)(3)(i) (“A description of State goals to guide the selection of activities to mitigate and reduce potential losses.”).

| | | |
|-------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Colorado | 2018 | <ul style="list-style-type: none"> Continued development of and improvements to hazards data relating to climate change Require integration of climate change considerations into local hazard mitigation plans Develop guidance for local jurisdictions to integrate climate change into local planning efforts |
| Connecticut | 2019 | <ul style="list-style-type: none"> Act as a clearinghouse for FEMA-produced educational materials in the area of natural hazards mitigation including flood management and planning; as well as climate change and adaptation approaches Mitigate effects of natural hazards and adapt to climate change Identify, develop and prioritize hazard mitigation projects including climate change and adaptation strategies and relocation for State-owned facilities considered at risk to natural hazards Investigate climate change adaptation strategies as they affect natural hazard mitigation and State investment policies, and link hazard mitigation activities with climate adaptation strategies when appropriate |
| Delaware | 2018 | <ul style="list-style-type: none"> Prioritize resiliency and flood risks for new infrastructure. Take future conditions in mind with measures to reduce vulnerability Executive order to prepare for climate change impacts and reduce GHG emissions |
| Florida | 2018 | <ul style="list-style-type: none"> Participate in climate change and sea level rise research that will further the state and local government's ability to plan for and mitigate the impacts of future vulnerability Assist in the integration of climate change and sea level rise research into state, local and regional planning efforts |
| Illinois | 2018 | <ul style="list-style-type: none"> Illinois Coastal Management Program will work with NOAA to offer technical support, coordination, data and monitoring, and funding to help mitigate coastal natural hazards |
| Maine | 2018 | <ul style="list-style-type: none"> Continue to monitor sea level rise and its implications for Maine |
| Maryland | 2016 | <ul style="list-style-type: none"> Education and outreach on historic properties and coastal hazards mitigation and climate change resiliency Provide financial and technical support to municipal and county governments to incorporate coastal hazard and |

| | | |
|----------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>climate change resiliency into local planning and policies</p> <ul style="list-style-type: none"> • Increase opportunities for formal and informal communication and adaptation planning, facilitate the exchange of ideas within the Chesapeake Bay watershed, and pilot green/grey infrastructure to prepare for and respond to climate impacts to vulnerable jurisdictions |
| Massachusetts | 2018 | <ul style="list-style-type: none"> • Enhance the Commonwealth’s resiliency to natural hazards and climate change by integrating programs and building institutional capacity • Reduce the impacts of natural hazards and climate change with forward-looking policies, plans, and regulations • Understand our vulnerabilities and risks and develop immediate and long-term risk reduction strategies for current and future conditions using the best available science |
| Michigan | 2014 | <ul style="list-style-type: none"> • Continue community-based climate adaptation planning |
| Mississippi | 2018 | <ul style="list-style-type: none"> • Continue education and outreach for Coastal Mississippi on impacts of sea level rise |
| Minnesota | 2019 | <ul style="list-style-type: none"> • Improve local planning and regulations such as by providing flexibility within the Minnesota Building Code for municipalities to adopt measures needed to increase resiliency for local climate conditions. • Improve structure and infrastructure projects by funding evaluation of cost/payback for incorporating climate resiliency into new and remodeled buildings, with an initial focus on high-risk facilities such as hospitals and schools. |
| Nebraska | 2014 | <ul style="list-style-type: none"> • Use data from Climate Assessment and Response Committee (CARC) to predict future areas of concern for drought & climate change ill-effects |
| New Hampshire | 2018 | <ul style="list-style-type: none"> • Address the challenges posed by climate change as they pertain to increasing the risk and impacts of the hazards identified within this plan |
| North Carolina | 2018 | <ul style="list-style-type: none"> • Enhance the NC ECO-Net through the State Climate Office to provide comprehensive weather and environmental monitoring in each of North Carolina's 100 counties |
| New York | 2019 | <ul style="list-style-type: none"> • Build capacity for communities to develop climate-adapted hazard mitigation plans • Provide training and technical assistance for communities |

| | | |
|---------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | to include climate adaptation and green infrastructure in risk assessment and mitigation strategies |
| Ohio | 2014 | <ul style="list-style-type: none"> • Develop greater built environment resilience • Offer several strategies for mitigation and adaptation |
| Oregon | 2015 | <ul style="list-style-type: none"> • Complete a Climate Change Vulnerability Assessment and Adaptation Pilot for north coast highways |
| Pennsylvania | 2018 | <ul style="list-style-type: none"> • Increase awareness about the impacts of climate change |
| Texas | 2018 | <ul style="list-style-type: none"> • Mitigation activities are designed to accomplish multiple objectives, including damage reduction, environmental enhancement, historic preservation, tourism/ recreation, economic recovery/development, and building community resilience to climate variance |
| U.S. Virgin Islands | 2014 | <ul style="list-style-type: none"> • Update the multi-hazard risk assessment to incorporate climate change models into the hazard and vulnerability analysis |
| Vermont | 2018 | <ul style="list-style-type: none"> • Ensure that hazard mitigation action accounts for-and helps us adapt to- climate change |
| Washington | 2018 | <ul style="list-style-type: none"> • Reduce the conversion of ecologically important lands for development, shoreline armoring implementation strategy, Puget Sound action agenda through the Interagency Climate Adaptation Network |
| West Virginia | 2018 | <ul style="list-style-type: none"> • Integrate Climate/Land Use change into planning • Examine how predicted weather patterns will affect likelihood of hazards and severity of the hazards (short-term and long-term) • Develop protective action recommendations related to land use changes and climate change |
| Wisconsin | 2017 | <ul style="list-style-type: none"> • Fund local health department pilot projects to increase the capacity to understand climate-related health impacts and incorporate climate adaptation strategies when planning. • Incorporate Climate Resilient Mitigation Activities (CRMAs) into WEM's scoring system for preapplications |

**Not an exhaustive list*

3.6 Further Discussion of SHMP Categories

Category 1

Only one SHMP met the criteria for category 1. Plans in this category either do not mention climate change related issues or make inaccurate statements regarding climate change. While the 2013 SHMP Report listed 10 states in this category, this update includes only Wyoming. Wyoming’s plan did not mention climate change, changing future conditions, or similar language in evaluating hazards.²⁰ This HMP was updated in 2016—the same year that the 2016 FEMA Climate Guidance went into effect—but appears to fail to meet the criteria in the guidance. Wyoming’s SHMP did make a few statements about the potential capability to model future climates or predict future trends, but fell short of suggesting undertaking this work and based their probability of future impacts on past events.²¹

2016 FEMA Climate Guidance and Movement within Category 1

Wyoming’s 2016 plan seems unlikely to meet the 2016 FEMA climate guidance.

Category 2

The SHMPs in this category touch on climate change accurately, but briefly and focus on more general qualitative observations. Some of these states recognize the importance of climate change but fail to expand beyond a list of natural hazards and a couple of sentences. Other states may summarize a particular impact of climate change such as sea level rise without explicitly linking it to “climate change.” For example, the 2018 Texas plan uses the term “changing future conditions” or will indirectly discuss the result of a combination of impacts

²⁰ Wyoming Office of Homeland Security, *Wyoming State Mitigation Plan 2016-2021* (2016). “Table 93. State Agency Capabilities and State Funding Sources” list a Department of Transportation strategy to incorporate climate change considerations into an asset management plan. This is the sole mention of “climate change” in the document and in isolation did not seem to constitute a consideration of climate change within the SHMP.

²¹ *E.g., id.* at 222 (“Future impacts can be determined by weather analysis and prediction with drought and precipitation, and continuing studies with this relationship can be pursued further.”); *id.* at 81 (“Such scenarios may be derived from long-term proxies of climate variability such as those provided by tree-rings, but might also be obtained from model simulations of past and future climates.”).

such as how “sea level rise paired with increasing intensity and frequency of hurricanes” can impact coastal erosion.²² Kentucky similarly alludes to climate change indirectly without applying climate change specifically to hazard profiles.

2016 FEMA Climate Guidance and Movement within Category 2

All three of the states in this ranking category have published approved plans since the guidance went into effect but still do not discuss the need for future adaptation to climate change. Discussions of climate change in these plans seem unlikely to meet the criteria of the 2016 FEMA Climate Guidance though this is subject to interpretation of what constitutes minimal compliance.

Category 3

SHMPs in this category include accurate discussion of climate change, typically of at least a few paragraphs, but in some cases more extensively. These descriptions tend to acknowledge future impacts, changing future conditions, and areas of vulnerability. Climate change is explicitly addressed in all category 3 SHMPs. Most often the discussion is primarily qualitative, but with different levels of integration of quantitative data across states. Sporadic use of quantitative climate data might place a state in category 3 whereas sustained use quantitative climate data across hazards could tip the state into category 4. There is a wider range of variability within this category to reflect states with improved reports since the 2013 SHMP Report, but which could go further to integrate planning, increase quantitative data, and add mitigation strategies to achieve the more robust climate change discussion in category 4 plans. Sometimes states that begin to include these additional types of information remain in category 3 because their discussion of climate change is overall relatively brief and qualitative

²² Texas Department of Public Safety Emergency Management, *State of Texas Hazard Mitigation Plan* (October 2018) at 221.

as compared to the more involved coverage in category 4 or the actions in category 3 may be more oriented around future data collection than implementing solutions.

Some category 3 plans, such as Utah, provide an overview of historical and projected climate change trends as its own chapter or a separate hazard. In the case of Nebraska, climate change is its own subsection in the risk assessment section, discussed at the top-level over several pages, but including acknowledgement of at least some climate trends, impacts, and related state actions. Other states include climate change subsections within profiles for hazards that are affected by climate change or combine this coverage with a climate change section. States varied in how narrowly they defined hazards linked to climate change. Many states focused primarily on climate impacts for a few of the hazards most vulnerable to climate change. For example, coastal states such as Guam, Maine, and Virginia focused on sea level rise. Sometimes states in this category showed some striking shortcomings. For example, despite being a coastal state, North Carolina barely mentioned sea level rise as a state hazard of concern in regard to climate change. Another striking shortcoming could be inclusion of suboptimal data. For example, Iowa focused on changing climate conditions related to drought, flooding, and winter storms, but largely used 2010 climate assessment data even though the plan was prepared in 2018.

In some cases, SHMPs that otherwise might appear to have some of the category 4 criteria, such as more quantitative coverage of climate change to rank in category 4 were put in category 3 because their discussion included statements that underplayed or cast doubt on the role of climate change in a hazard in a way inconsistent with the scientific consensus. For example, the SHMP for American Samoa listed climate change as its own hazard because climate change, “directly impacts American Samoa by increasing the impacts of hazard events such as flooding, drought and tsunamis. In addition, climate change *may be a possible cause* of sea

level rise.”²³ These doubt-casting statements in combination with accurate statements, quantitative data, and/or integration of climate change into the SHMPs strategic goals were found to be distinguishable from the brief mentions of changing climate conditions in category 2.

Louisiana was a particularly difficult state to rank as it included forward-looking quantitative climate-related projections for a variety of hazards, emphasized these changing conditions and their expected costs upfront in their analysis, and included extensive information on their integration and development of efforts to address the impacts of climate change. Louisiana was given a rank of category 3 because it had incomplete quantitative information on floods, minimized the discussion of sea level rise (even though it was integrated into projections pulled from another report), and minimized risk of levee failure.²⁴

On the other end of the spectrum, several category 3 SHMPs included several pages of accurate, up-to-date qualitative climate information with sporadic use of quantitative data, but simply fell short of the more extensive use of quantitative data and an integration of climate change into the purpose or mitigation strategies of the report. Idaho provides a good example of one of these more robust category 3 SHMPs. The Virgin Islands also displayed a good example of qualitative summaries with some integration of quantitative information and recognition for need to further expand quantitative information that put it close to a category 4.²⁵

2016 FEMA Climate Guidance and Movement within Category 3

²³ Prepared by Jamie Caplan Consulting LLC, for the American Samoa Governor’s Office and American Samoa Territorial Hazard Mitigation Council, *Samoa Territory of American Samoa Multi-Hazard Mitigation Plan* (2015) at 71.

²⁴ For discussion of risk to Louisiana levee infrastructure in *see e.g.*, Thomas Frank, *After a \$14-Billion Upgrade, New Orleans’ Levees Are Sinking* (April 11, 2019), E&E NEWS, available at <https://www.scientificamerican.com/article/after-a-14-billion-upgrade-new-orleans-levees-are-sinking/>.

²⁵ A 2019 Plan Update is expected from the Virgin Islands and would take little improvement to bump up their SHMP to a category 4.

Nineteen out of 27 states in this ranking category published approved plans since the new guidance went into effect. Many states in this category noted the 2016 FEMA Climate Guidance. Some states even issued amended reports following the release of the 2016 FEMA Climate Guidance. For example, South Dakota released a 2016 addendum including further discussion of climate change for each hazard profile. South Dakota's 2014 plan update included a survey sent to 107 agencies in which 61% of all survey respondents did not cite climate change as a concern to the state²⁶ so it is possible that the guidance played a role in motivating further climate analysis. However, the six states that remained in this category from the Babcock 2013 SHMP Report (FL, IL, ME, MI, NC, and WV) all published reports in 2018 or 2019 so the guidance proved insufficient to motivate those states to extend beyond a category 3 level of climate analysis.

Eighteen states in this category showed an improvement in their ranking. Six of these states moved up one ranking and 12 states moved up two rankings.

Category 4

The SHMPs in category 4 include thorough and in-depth discussions of climate change and at least some integration of climate concerns in future impact adaptation and mitigation planning. These states include even more quantitative assessment of hazard risks than category 3, as well as explicit targets and mitigation goals directed towards climate adaptation.

Category 4 SHMPs discuss climate change more robustly and identify it as an urgent issue explicitly or by including mitigation strategies and adaptation actions that begin to mitigate the problem. For example, Pennsylvania introduces its plan with a discussion of how disasters are increasing across the United States and are "projected to increase due to the impacts of climate change, therefore adding data, analysis, and action related to climate change was an important component of this plan update." It includes quantitative information on climate risks and links to a toolkit with climate mitigation strategies. Alaska featured

²⁶ South Dakota Hazard Mitigation Team, *Hazard Mitigation Plan* (2014) at 2-12.

appendices dedicated to climate change factors such as public health and projections of injuries and illnesses due to climate change, as well as separate climate change influences and climate change factors subsections within the main plan. New Jersey identified quite extensive information on climate-related and exacerbated hazards, such as flooding and sea level rise, and the adaptation actions being undertaken to mitigate these hazards. The extent of coverage of climate-related risks and actions; particularly in regard to flooding, sea level rise and severe repetitive loss properties; put it under strong consideration for a Category 5, but the limited explicit discussion of climate change itself across relevant hazards made it seem less than an optimal model because it was difficult to determine if all significant impacts of climate change were receiving adequate attention. For example, there was relatively little discussion of planning for health impacts of heat waves and a greater number of days when citizens would experience extreme heat.

2016 FEMA Climate Guidance and Movement within Category 4

Given that states in this category include more robust integration of climate change into their risk assessments and inclusion of climate change in mitigation actions, they are likely candidates to be compliant with the 2016 climate guidance. At times this compliance may be responsive to the issuance of the guidance. For example, Wisconsin amended its 2016 pre-climate guidance plan in 2017 to address and further incorporate the 2016 climate guidance and their 2017 moved up a category in the rankings.

Overall, 9 out of 11 states in this ranking category have published approved plans since the new guidance went into effect. Category 4 is an improvement for 8 of the 11 states from the 2013 SHMP Report: states moved up one category ranking, 2 state moved up two category rankings, and 4 states moved three category rankings.

Of particular note is the impressive leap made by four states from a category 1 ranking in the 2013 SHMP Report to a category 4: Alabama, Delaware, Missouri, and Montana. These states initially included no or inaccurate climate change discussion in the 2013 SHMP Report,

but by 2019 have considerable analysis across hazard profiles providing both quantitative and qualitative information. These states took some further additional steps. Alabama mapped and located areas or regions in the state most vulnerable to each hazard. Delaware emphasized the impacts, intensity, and frequency of its state hazards and prioritized resiliency in its plan. Other climate solution tactics included an executive order to prepare for climate change impacts and greenhouse gas emissions reductions. Finally, Montana’s updated 2018 plan featured a table that summarized the projected changes for each hazard due to climate change impacts as well as a probability ranking of each hazard ranging from unlikely to highly likely.

Three states remained in this category from the 2013 SHMP Report (AK, MD, NH), but that does not mean they did not improve since the 2013 SHMP Reports—rather they did not improve dramatically enough to enter the new category 5.

Category 5

This category was added to help designate states which received a category 4 rating in 2013, but have made significant improvements in climate change considerations since then. All states in this newly created category released updated plans in 2018 or 2019. Efforts from these states fulfill the criteria of a category 4 and build upon it in one or more of the following ways: climate change is designated as a priority in these plans as part of the overall vision or plan mission, expanded and more granular coverage of quantitative climate data, further development of mitigation and adaptation actions, and support for local and regional plans and actions to integrate climate change. Typically, a category 5 state did several or all of these measures. States which did not previously receive a ranking of 4, but met this criteria were also eligible for category 5 status.

Vermont provides an example of how these SHMPs might make climate change a guiding principle. Vermont’s SHMP states a mission “to protect life, property, natural resources and quality of life in Vermont by reducing our vulnerability to climate change and natural

disasters.”²⁷ Vermont’s SHMP also reviews global and regional changes in climate, climate change trends, and discusses “climate refugees,” people who will become displaced due to climate change impacts. Massachusetts also prioritized climate change in its update 2018 plan by retitling its plan to “Massachusetts State Hazard Mitigation and Climate Adaptation Plan.” This new plan completely integrates climate change mitigation into its natural hazards assessment with each hazard discussed thoroughly (quantitatively and qualitatively) within the context of climate change. The plan has five goals that emphasize climate change considerations:

- Enhance the Commonwealth’s resiliency to natural hazards and climate change by integrating programs and building institutional capacity.
- Reduce the impacts of natural hazards and climate change with forward-looking policies, plans, and regulations.
- Understand our vulnerabilities and risks and develop immediate and long-term risk reduction strategies for current and future conditions using the best available science.
- Increase the resilience of State and local government, people, natural systems, the built environment, and the economy by investing in performance-based solutions.
- Support 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.²⁸

Moreover, Massachusetts included information on its own state specific climate projections and highlighted its plans, policies, and tools--such as an online gateway for policymakers, local planners, and the public to identify and access climate data, maps, websites, tools, and documents on climate change adaptation and mitigation.

²⁷ Vermont Emergency Management, *2018 Vermont State Hazard Mitigation Plan* (2018) at ii.

²⁸ Massachusetts Emergency Management Agency, *2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan* (September 2018).

States could also address climate change through their own hazard vulnerability rankings. For example, Hawaii ranked climate change as its hazard of highest concern “due to the fact that the State is currently experiencing the impacts of the changing climate today.”²⁹ In addition, each hazard contained subsections on potential changes and future probability resulting in climate change as well as future changes that may impact state vulnerability. Hawaii also offered detailed quantitative projects of sea level rise that went above and beyond some of the more overarching figures used in other plans.³⁰

States in this category also often supported inclusion of climate change discussion within local mitigation plans. Colorado is spearheading efforts to require integration of climate change considerations into local hazard mitigation plans. Colorado’s SHMP includes discussion of each hazard with a table that included location, extent and intensity, frequency and duration throughout the state to support this process. Sometimes this effort was accomplished through goal setting. California’s State Strategy includes a goal to “incorporate climate change into local, regional, and statewide hazard profiles, risk assessments and mitigation plans.”³¹ For a number of hazards, a lesser degree of quantitative projections were integrated into the report itself, but other supporting planning documents corroborated the integration of climate impacts into the state’s planning.

California expanded its overview of climate change risks and adaptation actions to go above and beyond its already extensive coverage in its previous report. California provides a model of some of the most extensive coverage of climate change in an SHMP so far and includes both adaptation and mitigation actions and coverage of how these activities are integrated across policies, agencies, and plans. Like Colorado, part of its expansion focuses on setting a mitigation objective is to “acknowledge, incorporate, and integrate recognized data on climate

²⁹ Hawaii Emergency Management Agency, *State of Hawaii 2018 Hazard Mitigation Plan* (August 2018, prepared by Tetra Tech), at 4-13.

³⁰ *Id.* at Section 4.2.

³¹ California Governor’s Office of Emergency Services, *2018 State of California Multi-hazard Mitigation Plan* (2018) at 79.

change impacts on hazards, risks, and vulnerabilities available from credible scientific sources into state, local, tribal, and private sector mitigation plans, strategies, and actions.”³²

As one of the older plans in this category, Oregon’s SHMP still fully integrated climate change, with 237 mentions of climate change in the document, quantitative future projections of climate change’s effects across hazards, and explanations of how climate risk assessments and adaptation plans are being undertaken in the state. It also includes a discussion of how the 2020 SHMP will build upon these efforts and that plan is expected to cover climate change even more extensively.

2016 FEMA Climate Guidance and Movement within Category 5

All states in this category were previously ranked as either category 3 or 4 in the 2013 SHMP Report. Thus, all of these states discussed climate change in some detail prior to the issuance of the 2016 FEMA Climate Guidance. Their improvement is probably tied to prioritization of addressing climate change at the state level. All but one of the plans in this category were released in 2018 or 2019 indicating a recent upward trend in quality among states that prioritize addressing climate change.

³² California Governor’s Office of Emergency Services, *2018 State of California Multi-hazard Mitigation Plan* (2018) at 65.

4. CONCLUSION

The 2019 SHMP Report indicates a wide variability in how well states address climate change in their SHMPs. A small number of states fail to even mention the term “climate change.” Other states have reframed their plans to focus on climate change, devoted many pages to analysis of climate-related hazards, integrated climate change into adaptation actions and planning, collected detailed climate projections to inform their efforts, and offered support for local plans seeking to include climate change considerations. Nevertheless, the majority of states have improved their discussion of climate change in their SHMPs since the 2013 SHMP Report and now contain at least a minimal discussion of climate change risks. Twenty-two states achieved a ranking of category 4 or 5 indicating more extensive and quantitative assessment of climate-related risks and integration into mitigation strategies and adaptation actions. While the FEMA climate guidance may not be the primary factor driving the most ambitious SHMPs, it may still prove useful as a floor for some of the states that are still holding out against integrating climate change considerations into their SHMPs.