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Socializing the CZMA:

How Redefining “Community Resilience” Is Changing Coastal Management

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Introduction

More than 50 percent of the American population lives or works in coastal counties.¹ As sea levels rise and catastrophic disasters become more frequent, coastal states are searching for ways to keep their communities safe and economies afloat. These strategies fall under the general umbrella term “resilience,” or the capacity of states to withstand, respond to, and bounce back from hazards. And as the science of resilience changes, so too do states’ coastal management strategies.

The notion of resilience has expanded over the last twenty years to not only address physical or “gray infrastructure,” but also “green infrastructure.” In the late 1990s and early 2000s, resilience practitioners began to quantify the value of protective services provided by coastal ecosystems.² The EPA’s website now provides resources for states interested in

adopting a “green infrastructure approach” that restores wetlands to mitigate disaster impacts, with the added co-benefits of improving water quality, providing aquatic habitat, and increasing carbon sequestration.³

Today, the science of resilience is expanding again to address a new frontier: “social infrastructure.” Resilience practitioners recognize that a community’s ability to prepare for and recover from disasters depends as much on social factors as physical barriers.⁴ One hallmark of this transition is the increased focus of states’ coastal management programs (CMPs) on improving “community resilience,” an umbrella term with no agreed-upon definition. However, a consensus definition is now emerging that focuses on discrete *social* indicators of vulnerability, including income inequality, unemployment, disability, and English language proficiency. This transition brings coastal managers into a new programmatic realm that could significantly expand the types of activities states include in their CMPs.

As states expand their coastal management activities to address “community resilience” concerns, the question remains whether such activities fit within coastal states’ mandate under the Coastal Zone Management Act (“CZMA”), and whether those

1 *Building Resilience in Coastal Communities*, CLIMATE.GOV (last modified Mar. 30, 2020), <https://toolkit.climate.gov/topics/coastal-flood-risk/building-resilience-coastal-communities>.

2 See, e.g., Janet Abramowitz, *Unnatural Disasters*, ed. Linda Starke 7 (Washington, D.C.: World Watch Institute, 2001) (finding coastal ecosystems including wetlands and marshes function as “shock absorbers,” mitigating the effects of environmental disasters).

3 *Green Infrastructure: Coastal Resiliency*, EPA (last visited Apr. 22, 2020), <https://www.epa.gov/green-infrastructure/coastal-resiliency>.

4 See, e.g., FED. EMERGENCY MGMT. AGENCY, A WHOLE COMMUNITY APPROACH TO EMERGENCY MANAGEMENT: PRINCIPLES, THEMES, AND PATHWAYS FOR ACTION 1 (Dec. 2011).



activities can qualify for federal CZMA funding. This article reviews to what extent the CZMA permits states to integrate community resilience activities into their CMPs, drawing on examples from state coastal management agencies already engaged in this field.

What does “community resilience” mean?

While there is no agreed-upon definition of “community resilience,” government, industry, and nonprofit organizations involved in disaster response increasingly use the term to refer to a range of *social* vulnerability indicators. These indicators include both individual and population-level variables that impact a community’s ability to withstand environmental hazards. In 2017, researchers conducted a systematic literature review analyzing how disaster practitioners used the term community resilience, finding nine common “core elements”: local knowledge, community networks and relationships, communication, health, governance and leadership, resources, economic investment, preparedness, and mental outlook.⁵

Federal agencies involved in coastal management

5 Sonny S. Patel, M. Brooke Rogers & Richard Amlôt, *What Do We Mean by ‘Community Resilience’? A Systematic Literature Review of How It Is Defined in the Literature*, 1 PLoS CURR. 9 (2017).

are also slowly adopting this exclusively social definition of “community resilience.” In 2015, NOAA’s Office for Coastal Management (“OCM”) issued a report to guide local planners in establishing resilience baselines and monitoring systems. In that report, OCM broadly defined a community’s level of “resilience” as “how well it is prepared for and can respond to a natural disaster,” encompassing everything from “supporting vulnerable populations” to “preserving historical landmarks.”⁶ Last year, FEMA narrowed that definition by commissioning a study of commonly used community resilience indicators.⁷ FEMA’s study acknowledged that while “there is no absolute measurement of resilience,” there are twenty social “Commonly Used Community Resilience Indicators,” shown in the table below.

6 NOAA OFFICE FOR COASTAL MANAGEMENT, COASTAL COMMUNITY RESILIENCE INDICATORS AND RATING SYSTEMS 1–2 (2015), <https://coast.noaa.gov/data/digitalcoast/pdf/resilience-indicators.pdf>.

7 LESLEY EDGEMON ET AL., ARGONNE NAT’L LAB., COMMUNITY RESILIENCE INDICATOR ANALYSIS: COUNTY-LEVEL ANALYSIS OF COMMONLY USED INDICATORS FROM PEER-REVIEWED RESEARCH 7 (2019). Though FEMA does not play a direct role under the CZMA, state CMPs often align their activities with FEMA’s Community Rating System (CRS) under the National Flood Insurance Program (NFIP) in order to reduce local flood insurance premiums.



Table 1. Commonly Used Community Resilience Indicators

Population-Focused Indicators (11)	Number of Methodologies in Which the Indicator Is Used
Educational Attainment (lack of HS diploma)	7
Unemployment Rate	7
Disability	6
English Language Proficiency	6
Home Ownership	6
Mobility (lack of vehicle)	6
Age	5
Household Income	5
Income Inequality	4
Health Insurance	4
Single-Parent Households	3
Community-Focused Indicators (9)	Number of Methodologies in Which the Indicator Is Used
Connection to Civic and Social Organizations	6
Hospital Capacity	5
Medical Professional Capacity	5
Affiliation with a Religion	4
Presence of Mobile Homes	4
Public School Capacity	4
Population Change	4
Hotel/Motel Capacity	3
Rental Property Capacity	3

Source: Lesley Edgemon et al., Argonne Nat’l Lab., Community Resilience Indicator Analysis: County-Level Analysis of Commonly Used Indicators From Peer-Reviewed Research 7 (2019).

Several states are now using social indicators of vulnerability to assess which coastal counties are most at risk, and to design programs that address those protection gaps (described in Table 2 below). California has gone one step further and integrated broad principles of equity and environmental justice into every stage of their CMP, including retroactive analyses of how past programming might have entrenched or increased these vulnerabilities. However, the question remains whether these activities are valid components of a state’s CMP as delineated under the Coastal Zone Management

Act (CZMA). The following section reviews these requirements, and analyzes if and how states can integrate community resilience activities within the parameters of the CZMA.



Does the CZMA support states integrating community resilience activities into their CMPs?

While states do not have to seek federal approval for their CMPs, the CZMA creates two powerful incentives for states to do so: federal consistency, and grant funding. Federal consistency gives states the power to review federal activities that will affect a state's coastal uses or resources and ensure those activities are consistent "to the maximum extent practicable" with a state's approved CMP.⁸ States with approved CMPs can also access federal grants issued under the CZMA for general program administration, as well as supplemental grants for special projects and technical assistance.

The CZMA sets a floor, not a ceiling, for what must be included in a CMP. This structure provides states with ample flexibility to integrate community resilience activities on top of the CZMA's basic requirements. There are also several CZMA provisions that allow states to directly integrate community resilience activities. First, CMPs must include "an inventory and designation of areas of particular concern within the coastal zone."⁹ The CZMA does not tell states how to identify "areas of particular concern," giving states

leeway to include social vulnerability indicators in their analysis. Second, CMPs must include a planning process for the protection of, and access to "coastal areas of . . . esthetic, ecological, or cultural value," inviting states to engage in assessments and programs that explicitly address cultural, i.e. social, activities.¹⁰ Finally, the CZMA requires states to ensure "public participation in permitting processes, consistency determinations, and other similar decisions."¹¹ Meaningful public participation in and of itself can improve several "core elements" of community resilience, including improved access to information, preparedness, and community networks.¹² Strengthening public participation programs in state CMPs therefore satisfies both a central priority under the CZMA and can improve community resilience capacities.

Current CZMA regulations give states ample room to engage in community resilience activities. These regulations require state CMPs to provide for the management of areas "vulnerable to sea level rise,"¹³ including reducing "the impacts of floods on human safety, health and welfare."¹⁴ The regulations do not define "vulnerability," leaving it to the states to determine which indicators they rely on to identify areas in need of management. Furthermore, the

8 16 U.S.C. §1456(c)(1)(A).

9 16 U.S.C. §1455(d)(2)(C).

10 16 U.S.C. § 1455(d)(2)(G).

11 16 U.S.C. §1455(d)(14).

12 FED. EMERGENCY MGMT. AGENCY, NATIONAL MITIGATION FRAMEWORK 2, 8 (2d ed. 2016) ("Joint planning and participation by diverse populations are essential to increasing and sustaining community resilience.").

13 15 C.F.R. 923.3(b).

14 *Id.* at 923.3(c).



regulation's focus on human welfare suggests states should assess vulnerability from a social, or community resilience, perspective, as opposed to focusing on purely green or gray infrastructure. Finally, the regulations specifically urge states to take population data into account in "identifying who will be affected by the program and how."¹⁵ Using these regulations as a starting point, states can use these data to also identify and prioritize high-risk communities, not only to assess who "will be affected," but also whom to integrate as stakeholders in decision-making processes.

NOAA's current Strategic Plan also encourages states to shift towards a community resilience approach by "integrating social and economic information into coastal management."¹⁶ The Plan emphasizes that "coastlines . . . are home to some of the most at risk populations, including children, the elderly, households where English is not the primary language, and those in poverty."¹⁷ In order to protect these populations, the Plan urges states to integrate "existing and emerging economic, social, cultural, ecological, stakeholder, and other relevant data" into decision-making processes.¹⁸ The Plan also emphasizes the flexibility states have under the CZMA "to design programs that best address local challenges and work within state and local laws and

regulations."¹⁹ Thus the Plan gives states ample room and encouragement to integrate social vulnerability indicators and community resilience activities into their CMPs.

How are states currently integrating community resilience into their CMPs?

Resilience activities are often planned in phases, feeding into each other to form a cycle. In the first phase, groups **assess risks and vulnerability**, establishing a baseline against which to measure future outcomes.²⁰ These assessments in turn help governments **plan programs** to address identified vulnerabilities and **prioritize** highest-risk areas. In 2018, New Jersey integrated community resilience

15 *Id.* at 932.3(e)(1).

16 *National Coastal Zone Management Program, Strategic Plan 2018–2023*, NOAA OFFICE FOR COASTAL MANAGEMENT 6 (last visited March 19, 2020), <https://coast.noaa.gov/data/docs/czm-strategic-plan.pdf>.

17 *Id.* at 1.

18 *Id.* at 7.

19 *Id.* at 2.

20 OCM offers state and local planners multiple tools with which to conduct such assessments, including the Community Resilience Index popularized through the 100 Resilient Cities Initiative (Arup, 2017); the Federal Emergency Management Agency's Draft Interagency Concept for Community Resilience Indicators and National Level Measures (FEMA, 2016); the University of South Carolina Hazards and Vulnerability Research Institute's Baseline Resilience Indicator for Communities (BRIC) (HVRI, 2018); and, the International Federation of the Red Cross and Red Crescent's Framework for Community Resilience (IFRC, 2014). See generally NOAA OFFICE FOR COASTAL MANAGEMENT, *supra* note 2.



principles into its assessment and planning activities through a new study called *A Seat at the Table*, which sought to “systematically integrate socially vulnerable and traditionally underrepresented populations into coastal management decision-making.”²¹ To accomplish this goal, the project prioritized improving planners’ access to social vulnerability data, which planners could then use to identify vulnerable populations; create outreach materials; and develop recommendations to improve integration of these groups into coastal resilience planning.

After completing the planning and prioritization phase, states move into the **implementation** phase. This may include piloting resilience programs in select communities before implementing a program state-wide. For example, the regional Gulf of Mexico Alliance received special Section 310 funding under the CZMA to implement a pilot project in ten communities, with each project addressing gaps identified through community resilience assessments. One project in Rockport, TX seeks to develop a county-wide Program for Public

Figure 1. The Resilience Cycle



Source: NOAA OFFICE FOR COASTAL MANAGEMENT, COASTAL COMMUNITY RESILIENCE INDICATORS AND RATING SYSTEMS 2 (2015).

21 *Equitable Community Resilience: Metrics and Methods for Coastal Hazards Planning*, NEW JERSEY COASTAL MANAGEMENT PROGRAM 1 (Oct. 12, 2018); Jeanne Herb et al., *A Seat at the Table: Integrating the Needs and Challenges of Underrepresented and Socially Vulnerable Populations into Coastal Hazards Planning in New Jersey* (Oct. 15, 2019), <http://eac.rutgers.edu/wp-content/uploads/PSM-Stakeholder-engagement-report-v.6-final.pdf>.



Information (PPI) to address the community's lack of informational access.²² Finally, after a program is implemented or after a disaster has struck, states **monitor** and **evaluate** the effectiveness of their programs, **adapting those programs** based on observed gaps or opportunities for improvement.

Most states are just beginning to integrate community resilience principles into their CMPs as part of the assessment, planning, and/or piloting phases. The table below, though not comprehensive, highlights some state and regional CMPs that currently include community resilience activities.

22 See *infra* Table 2.



Table 2. Examples of State CMPs Integrating Community Resilience-Related Activities

State/Region	Year	Activity	Description	Program/ Funding Source
California, San Francisco Bay	2019	Program-Wide (defines and centers social equity and environmental justice as guiding principles for all actions executed pursuant to the Plan).	The Plan includes an “Environmental Justice and Social Equity” section, recognizing how the Commission’s past actions have contributed to environmental injustices, and outlines guiding principles to integrate environmental justice and social equity into the Commission’s mission and activities. ²⁴	CMP
California, Coastal Commission	2020–2025	Note: These programs are bolstered by California’s Coastal Act, which gives the Commission authority to consider environmental justice when making permitting decisions. ²³	The Plan’s “Environmental Justice, Diversity and Tribal Relations” section emphasizes reducing barriers to public participation, and “promot[ing] equity and inclusion” in its activities. ²⁵	
Louisiana	2017	Assessment, Project Planning and Prioritization	The state’s 2017 Master Plan relies on seven “community metrics,” including “social vulnerability,” to identify projects that meet the Plan’s objectives. The “social vulnerability” metric considers the presence and location of “socially vulnerable groups” and how projects will impact those groups. ²⁶	CMP

23 Cal. Pub. Res. Code § 30013.

24 San Francisco Bay Conservation & Development Commission, *San Francisco Bay Plan* (last visited Apr. 4, 2020), https://bcdc.ca.gov/plans/sfbay_plan#40.

25 California Coastal Commission, *Public Review Draft, California Coastal Commission Strategic Plan 2020–2025* 23–26 (Dec. 6, 2019), https://documents.coastal.ca.gov/assets/strategicplan/2020-2025_Strategic_Plan_Public_Review_Draft_12.6.19.pdf.

26 Coastal Protection and Restoration Authority of Louisiana, *Louisiana’s Comprehensive Master Plan for a Sustainable Coast* 83 (June 2, 2017), http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan_Web-Book_CFinal-with-Effective-Date-06092017.pdf.



New Jersey	2018	Program-Wide	A new study, <i>A Seat at the Table</i> , seeks to improve planners' access to data to improve identification of socially vulnerable populations, and improve guidance and training to engage those populations in resilience planning. ²⁷	Section 309 Project of Special Merit
	2015	Assessment	Developed a Coastal Vulnerability Assessment and Mapping Protocol (CCVAMP) tool to assist local decision-makers in the identification of communities' vulnerability to coastal hazards. ²⁸	Section 309 Supplemental Grant
Gulf of Mexico Alliance	2016	Assessment, Community-Based Pilot Projects	Identified 10 community pilot projects to address resilience needs or gaps identified through community resilience assessments. Rockport, TX is developing a county-wide Program for Public Information (PPI) to address communities' lack of informational access. ²⁹	NOAA Regional Coastal Resilience Grant, Section 310 ³⁰
Mission-Aransas Reserve, Texas	2015	Assessment (Technical Assistance)	The Reserve's Coastal Training Program supports community trainings in Coastal Community Resilience Index assessments to help identify vulnerabilities to coastal hazards. ³¹	Texas Sea Grant (part of NOAA's National Sea Grant College Program)

27 Jeanne Herb et al., *A Seat at the Table: Integrating the Needs and Challenges of Underrepresented and Socially Vulnerable Populations into Coastal Hazards Planning in New Jersey* (Oct. 15, 2019), <http://eac.rutgers.edu/wp-content/uploads/PSM-Stakeholder-engagement-report-v.6-final.pdf>.

28 *New Jersey Coastal Management Program, Section 309 Assessment & Strategy 2016 – 2020*, NJDEP (Aug. 31, 2015), <https://www.nj.gov/dep/cmp/docs/new-309-strategy-assessment-%202016-2020.pdf>.

29 The Gulf of Mexico Alliance is a 501(c)(3) non-profit led by the five Gulf States (Texas, Louisiana, Mississippi, Alabama, and Florida) and includes a partner network of federal agencies, academic organizations, businesses, and other non-profits in the region.

30 Congress appropriated funds to the Regional Coastal Resilience Grant program from FY2015 to FY2017. EVA LIPIEC, Cong. Research Service, R45460, COASTAL ZONE MANAGEMENT ACT (CZMA): OVERVIEW AND ISSUES FOR CONGRESS 14 n. 59 (2019).

31 University of Texas Marine Science Institute, *Mission-Aransas National Estuarine Research Reserve Management Plan 2015-2020* 143 (Dec. 2015), https://missionaransas.org/sites/default/files/manerr/files/final_2015-2020_mission-aransas_nerr_management_plan_dec_2015_v3.pdf.



Though many other states reference “community resilience” activities in their CMPs, these activities do not explicitly address social resilience indicators. For example, Florida’s Coastal Partnership Initiative (CPI) allocates between \$10,000 and \$60,000 in grants for local projects to help build “Resilient Communities,” among other goals.³² Resilient Communities projects, however, do not focus on social indicators of vulnerability, but rather address a wide range of projects from developing energy efficiency to climate change adaptation strategies.³³ Similarly Alabama created a new “Community Resilience Initiative” in 2015 designed to improve Mobile and Baldwin counties’ scores in the National Flood Insurance Program’s Community Rating System in order to reduce homeowners’ insurance premiums.³⁴ These programs reflect a broader understanding of “community resilience” than the narrower definition explicitly referring to activities that evaluate and improve social resiliency indicators.

Can CZMA funding be used to support community resilience activities?

While states can use general program funds received under the CZMA to support community resilience activities, most states currently rely on CZMA supplemental funds issued under Sections 309 and 310, and other NOAA grants to fund community resilience projects in discrete phases.

Section 309 grants include Projects of Special Merit, though funding is subject to appropriations and thus varies significantly from year to year, rarely exceeding \$1.5 million annually.³⁵ Section 309 funds are very flexible and have been used to support novel community resilience programs. For example, New Jersey funded its study, *A Seat at the Table*, with a one-time \$226,080 Project of Special Merit grant.³⁶

In addition to Section 309 grants, states and regional organizations have used Section 310 Technical Assistance grants to conduct community resilience assessments and engage in community outreach. However, Section 310 grants receive appropriations on a haphazard basis and are by far the most underfunded of the CZMA grant funds, with

32 Florida Department of Environmental Protection, Office of Resilience and Coastal Protection, *Florida Coastal Management Program Guide 92* (May 23, 2019), <https://floridadep.gov/sites/default/files/FCMP-Program-Guide-2019.pdf>.

33 *Id.* at 92.

34 *Final Evaluation Findings, Alabama Coastal Management Program*, NOAA Office for Coastal Management (May 2017), <https://coast.noaa.gov/data/czm/media/alabamacmp.pdf>.

35 *Projects of Special Merit Selected for Funding: Fiscal Years 2012 to 2018*, NOAA OFFICE OF COASTAL MANAGEMENT (last visited March 18, 2020), <https://coast.noaa.gov/data/czm/enhancement/media/special-merit-funding.pdf>.

36 See NEW JERSEY COASTAL MANAGEMENT PROGRAM, *supra* note 15.



only \$4,570,000 disbursed between FY1972 and FY2017.³⁷ Most of these funds supported NOAA's Regional Coastal Resilience grant program between FY2015 and FY2017, which provided discrete funding for coastal resilience assessments and pilot projects, including for regional groups like the Gulf of Mexico Alliance discussed in the table above.

Several states have also received funding for community resilience assessments from NOAA's Sea Grant program, which provides technical assistance to states and communities through university partnerships. The Sea Grant program is implemented pursuant to the National Sea Grant College and Program Act of 1966.³⁸ The Sea Grant program prioritizes "resilient communities" programming largely through citizen-conducted assessments and hazard monitoring.³⁹

Conclusion

Coastal communities' resilience to environmental hazards can depend as much on social infrastructure as physical or green infrastructure. This understanding is now being incorporated into a

refined definition of "community resilience," a term once broadly used but quickly narrowing to refer to a range of *social* vulnerability indicators.⁴⁰

States enjoy ample flexibility under the Coastal Zone Management Act to incorporate community resilience activities into their Coastal Management Programs. They now also have explicit encouragement from NOAA to "integrat[e] social and economic information" into these programs. Already several states, including California and New Jersey, are modeling how to integrate community resilience activities into their CMPs, either as discrete activities or as overarching guiding principles.

As state coastal agencies expand into this social realm, it remains to be seen how community resilience activities affect federal consistency determinations, and of course, resiliency outcomes. California has gone further than any state by integrating principles of equity and environmental justice into all aspects of its CMP. It is unclear, however, whether California could reject a federal consistency determination for failing to comply with these principles. It is also unclear whether other states will adopt this new definition of community resilience, or continue to limit their CMP activities to green and gray infrastructure. Nevertheless, states enjoy significant flexibility under the CZMA to pursue community resilience activities as part of their CMPs, so long as they can find the funding to do so.

37 Lipiec, *supra* note 6 at 6.

38 33 U.S.C. § 1121 et seq.

39 *Helping community plan, adapt and recover*, NOAA (Fall 2019), https://www.seagrant.noaa.gov/Portals/0/Community-Resilience-FactSheet-Dec2019_accessible_1.pdf.

40 Sonny S. Patel, M. Brooke Rogers & Richard Amlôt, *What Do We Mean by 'Community Resilience'? A Systematic Literature Review of How It Is Defined in the Literature*, 1 PLoS CURR. 9 (2017).