



The Role of Social Capital In Coastal Communities' Resilience to Climate Change

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Photo by Heather Henkel, USGS

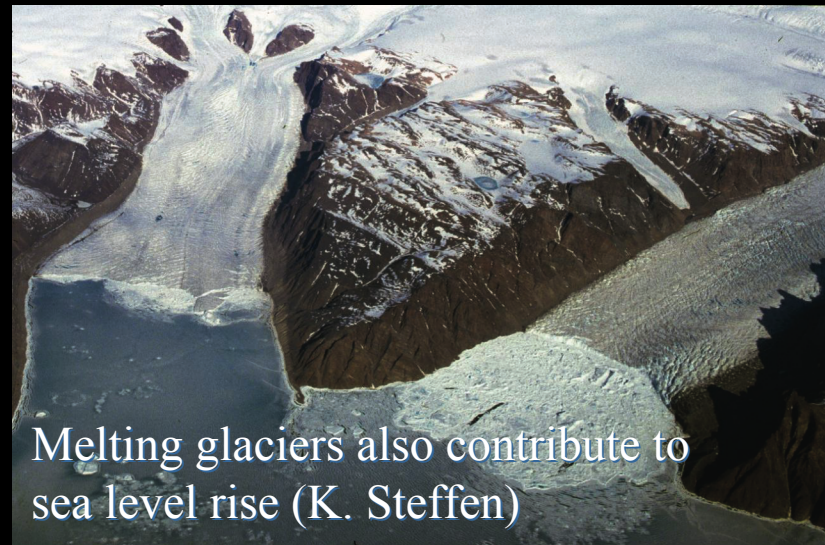
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Climate Change and Coastal Communities

- Coastal communities are major centers for sustaining the nation's economic, social, and environmental well being.
- Climate change poses numerous threats to coastal communities.
 - Rising Sea Levels driven by thermal expansion and melting glaciers (National Academy of Sciences, 2010)



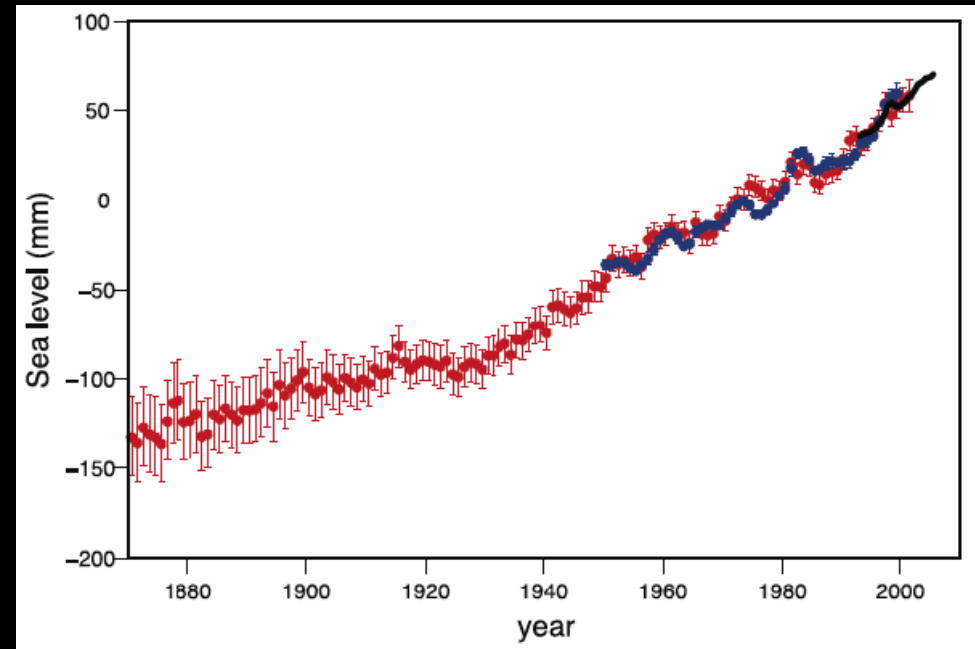
Thermal expansion leads to melting icebergs (www.thevarsity.ca)



Melting glaciers also contribute to sea level rise (K. Steffen)

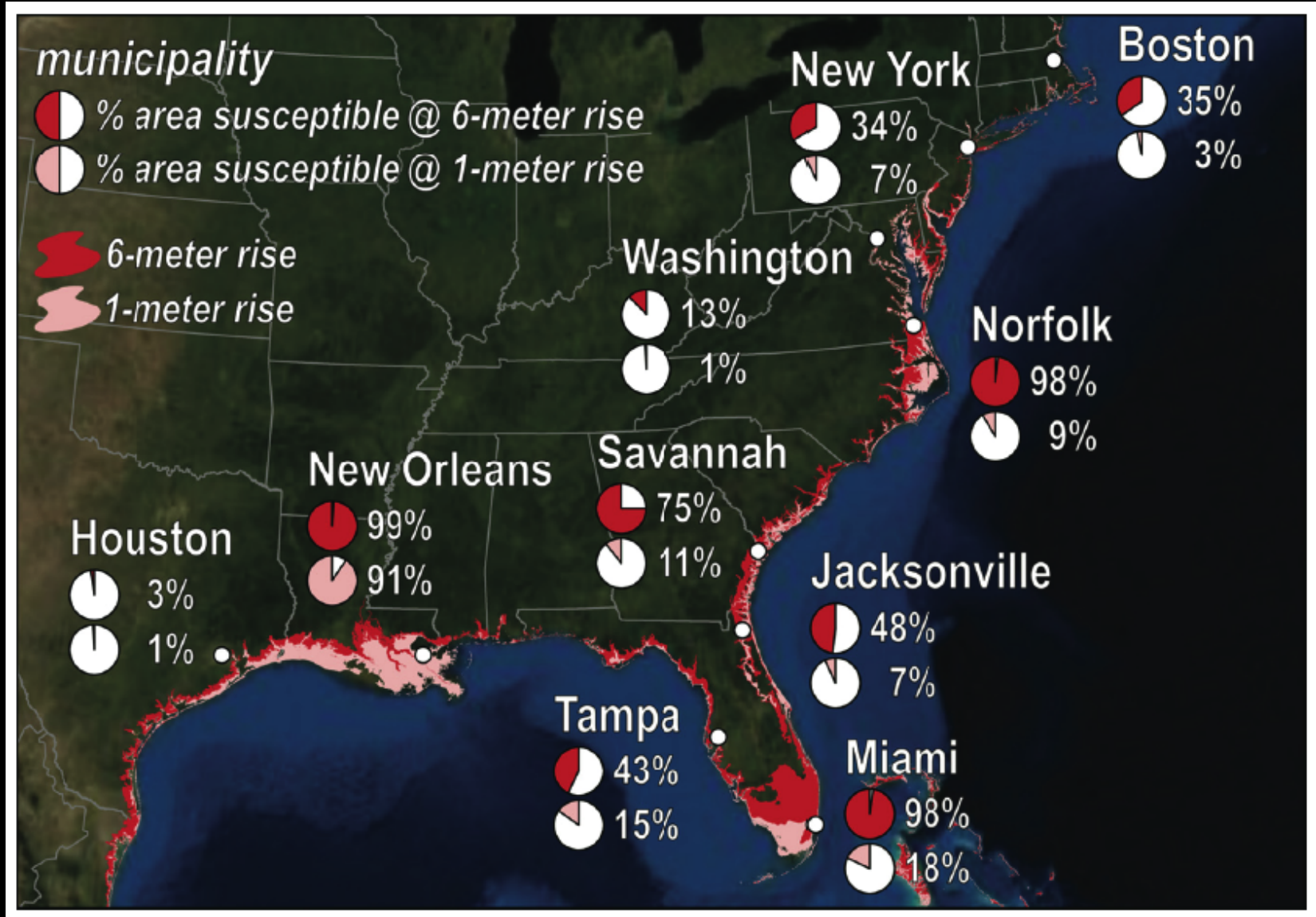
Climate Change and Coastal Communities

- Sea Level Rise
 - The rate of sea level rise has accelerated since the mid 19th century, with possible greater acceleration over the last two decades (Bindoff et al., 2007)
 - Recent projections estimate rises between 2.5 to 6.5 feet by the end of the century (Pfiffer et al., 2008)
- Coupled problems (Nicholls et al., 2007)
 - Increasing concentrations of environmental pollutants
 - Increased urban growth and development
 - Increased pressures on resource harvesting



Estimated sea levels from 1880 to 2010
(Bindoff et al., 2007)

Varied Impacts



Overpeck and Weiss, 2009

Options for Adaptation

- These future impacts suggest a highly uncertain future for coastal communities.
- To cope effectively, coastal communities will need to implement an array of adaptation options.

Technical mechanisms

- Retrofit public infrastructure
- Use “living” as opposed to “armored” shorelines

Policy mechanisms

- Eliminate public subsidies for high-risk (re)development
- Urban planning and development standards
- Adaptive plans/programs

Social mechanisms

- Increase social ties to external actors
- Increase connections to federal and private sectors
- Increase within community solidarity

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graph LR; A[Technical mechanisms] --> C((Coastal community climate change adaptation)); B[Policy mechanisms] --> C; D[Social mechanisms] --> C;
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Coastal community
climate change
adaptation

Dependency/Resiliency Framework

- A conceptual model of the determinants of coastal community climate change adaptation is proposed
- Emphasis is placed on the social and psychological processes which hasten or stall climate change resilience

Social Mechanisms

Dependencies

- Social-psychological
- Economic

Types and strength of community social capital

- Bonding
- Bridging



Resilience

- Resilient coastal communities are flexible, prepared for change and uncertainty, and are essential for societies to prosper in the face of unknown circumstances
- Community resilience is:
 - The amount of disturbance the community can absorb and still retain the same structure and function
 - The degree to which the community is capable of self-organization
 - The degree to which the community can build and increase its capacity for learning and adaptation

(Carpenter and Gunderson, 2001;
Folke et al., 2002; Holling, 1973)



New Orleans
September and November of 2005

Dependencies

- Resilience is determined by the exogenous social and economic forces which inhibit individuals' willingness or ability to adapt to changing environmental conditions.
- Economic dependencies
 - Occur through coastal communities' reliance upon specific natural resource based economic sectors (e.g., fishing, recreation, etc.) that are highly vulnerable to changing climatic variations.
- Social-psychological dependencies
 - Community members' cognitive and emotional attachments to occupations and geographic locations.
- These dependencies limit adaptive capacities.

Dependencies

Economic dependencies

- Couples individuals and communities with the health of the resource
- Forges occupational attachments (e.g., Becker and Carper, 1956; Carroll and Lee, 1990; Freudenburg, 1992)



Social-psychological dependencies

- Strong emotional bonds can limit willingness to adapt to changing conditions (e.g., Kaplan and Kaplan, 1982; Tuan, 1990).

Social Embeddedness

- Dependencies do not operate outside of social contexts.
- Rather, individuals' actions are embedded in, and influenced by, social contexts (Granovetter, 1985)
- The social contexts that define individuals' actions could either impede or hasten their willingness to adapt to climate change.
- Adaptation processes “involve the interdependence of agents through their relationships with each other, with the institutions in which they reside, and with the resource base on which they depend” (Adger 2003:388)

Social Capital

- “The information, trust, and norms of reciprocity inhering in one’s social networks” (Woolcock 1998:153)

Social Capital

Civic Approach

- Putnam
- Focuses on how social ties influence the effective functioning of modern democracies.

Resources Approach

- Bourdieu
- Coleman
- Social capital is an aggregate social resource, which influences individual behavior.

The Components of Social Capital

- Social capital involves objective associations between individuals
- These associations involve feelings of reciprocity, trust, and positive emotion (Paxton, 1999)

Social Capital

Trust

Objective Ties

1. Informal ties
2. Membership in voluntary associations

The Components of Social Capital

Trust

- “Socially learned and socially confirmed expectations that people have of each other” (Barber, 1983: 165).
- Enables individuals to engage in actions that otherwise would not have been possible had trust not been present.
- A community’s resilience to climate change is likely to be influenced by the extent to which individuals in those communities trust each other.

The Components of Social Capital

Objective Ties

1. Informal Ties

Individuals' informal friendships, whether they be with old schoolmates, fellow workers, or friends of friends, can create social capital through increased communication, information diffusion and social support (Paxton 1999)

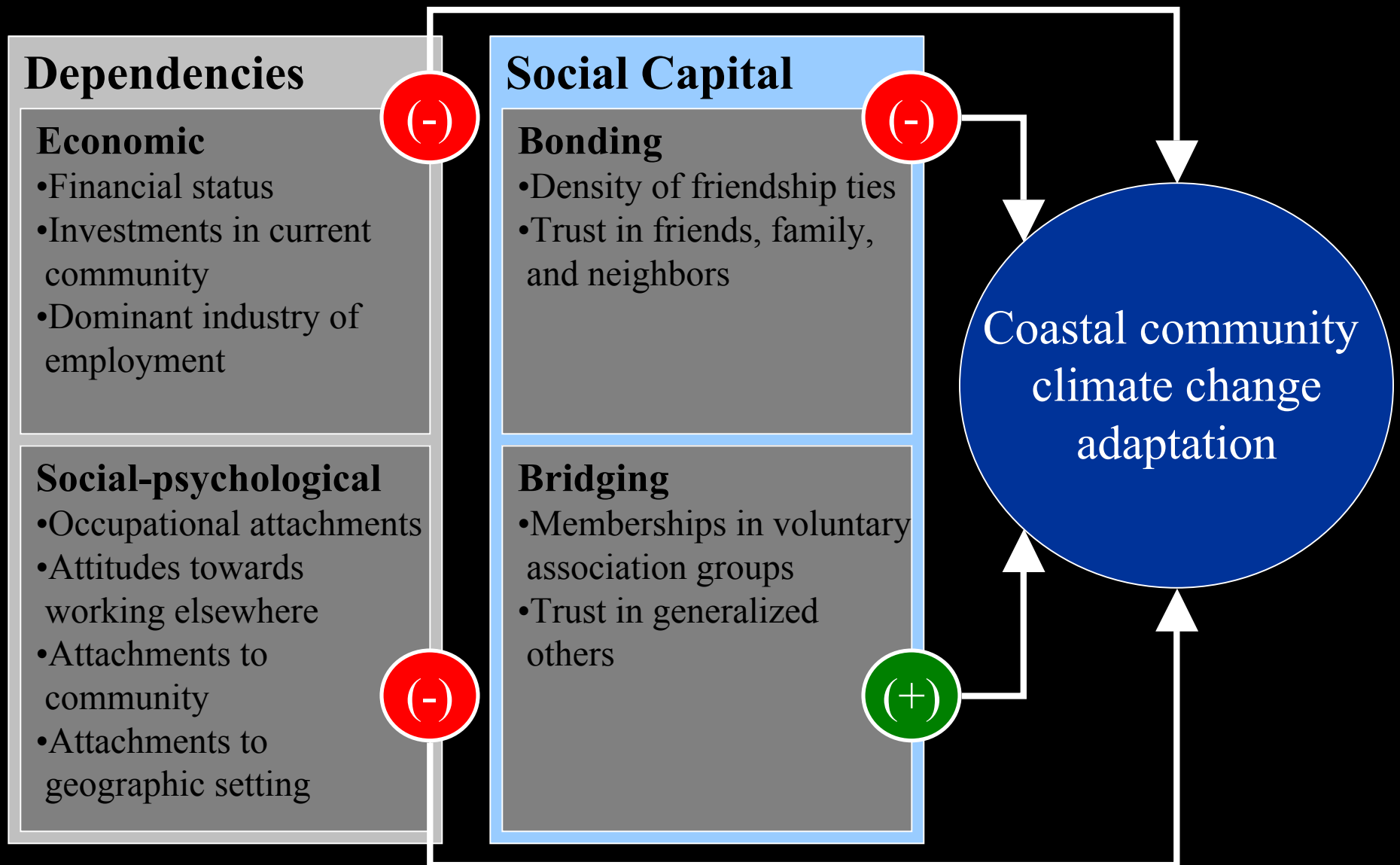
2. Voluntary Associations

Provides access to additional individuals that can provide the resources for individuals to solve collective problems.

Bonding and Bridging Social Ties

- Not all social capital is created equal; some forms of social capital may actually reduce a community's ability to adapt to climate change.
- **Bonding ties**
 - Between family members, friends, and neighbors in closed, tightly connected networks.
 - Dense network structures of strong, localized trust.
 - Can impose strict social norms that discourage change
- **Bridging ties**
 - Give access to resources and opportunities that exist in one network to a member in another network (Granovetter, 1973)
 - Allows individuals to access outside information and overcome social norms with support from outside the local network.

Theoretical Model of the Social Mechanisms Influencing Coastal Community Resilience



Summary

- Social capital theory has much to offer current research efforts aimed at understanding if and how coastal communities can collectively address the causes and consequences of climate change.
- In conclusion, if we, as scientists, accept that sustainability is “the capacity to create, test, and maintain adaptive capabilities” (Holling 2001:399), we should also, as social scientists, realize the huge potential that social theory can have on understanding how individuals, communities, and societies perceive and develop their adaptive capabilities.
- By gaining a clearer understanding of how social capital affects coastal communities’ perceived ability to adapt to changing environmental conditions, community leaders and policy makers at various levels of authority will be better equipped to help foster a sustainable ecological and social future.

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Photo by Heather Henkel, USGS

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