



An INFOstructure solution to the socio-ecological hazards of coastal flood control infrastructure

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ISSUE OF CONCERN

- The use of engineering infrastructure for flood hazards in coastal areas often occurs in the absence of socio-ecological data about coastal ecosystems and communities and results in unforeseen and multi-faceted coastal disasters
- Design and authority to use historic flood control structures provides engineering solutions to protect people and property, but the hazards of discharging freshwater into coastal areas and impacts of climate change were never considered in design



OUR PURPOSE

Create an information structure
(INFOstructure)
to support decision-making
surrounding the use of engineering
infrastructure for flood hazards in
coastal areas

OUR SOLUTION

A multi-faceted INFOstructure framework to guide modern flood control to mitigate negative outcomes

- Social science
- Natural science
- Engineering
- Federal, state, regional, local government
- Non-governmental organizations
- Academia
- Public- private partnerships
- Global connections
- Blue economy



A new intellectual structure for conceiving solutions to challenging ocean sustainability decisions

ADDRESSING CHALLENGES

Consequences of flood control structures are realized globally in aquatic and marine ecosystems already experiencing multiple stressors spanning climate change, eutrophication, and loss of biodiversity. Human impacts not considered in decision-making are felt by fishing communities and connected economies, and data collection on natural and human systems is uncoordinated and lacking baseline. ***This concept will identify knowledge gaps and permit ability to understand, anticipate, and address multiple stressors while engaging government and non-government actors in community preparedness, awareness, and warning.***



UNDERSTANDING EFFECTS OF
STRESSORS AND DEVELOPING
SOLUTIONS



ENHANCING MULTI-HAZARD
EARLY WARNING SERVICES,
MAINSTREAM COMMUNITY
PREPAREDNESS AND
RESILIENCE



ENSURING THE MULTIPLE
OCEAN VALUES ARE
UNDERSTOOD AND OVERCOME
BARRIERS TO
BEHAVIOR CHANGE

An aerial night photograph of a coastal highway. The road curves along the shoreline, with light trails from cars creating streaks of white and yellow. A small lighthouse is visible on the coast. The ocean is dark, and the sky is a deep blue with some clouds. The text 'TRANSFORMATIVE IMPACT' is overlaid in white, bold, sans-serif font in the top left corner.

TRANSFORMATIVE IMPACT

- Our concept challenges policy and management legacies with current knowledge about present and impending environmental change
- The inclusion of natural and social science data in coastal flood control decision-making has potential for major impact on ecological and sociological outcomes



CONNECTING WITH EXISTING INFRASTRUCTURE, TECHNOLOGY, AND PARTNERSHIPS

- The concept will initially focus on case studies in the US where flood control decisions are made at the federal level but impact state, regional, and local governments, communities, economies, ecosystems, and individuals
- Understanding the challenges requires academic and private partnerships and expertise of natural and social scientists
- This concept is interdisciplinary in nature, with proponents having expertise in natural and social science, with opportunities for engagement spanning all sectors of the blue economy



ENGAGEMENT PARTICIPATION COLLABORATION

- Coastal flood control is a global challenge and will impact current and future generations in all coastal nations
- This work will create a new intellectual structure for conceiving solutions to challenging ocean sustainability decisions and provides opportunity to learn from and collaborate with global experts including those in The Netherlands with experience in flood control engineering design, public planning and engagement



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