Supporting Climate Adaptation Planning with Robust Decision Making

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Credit to: Jordan Fischbach and David Groves

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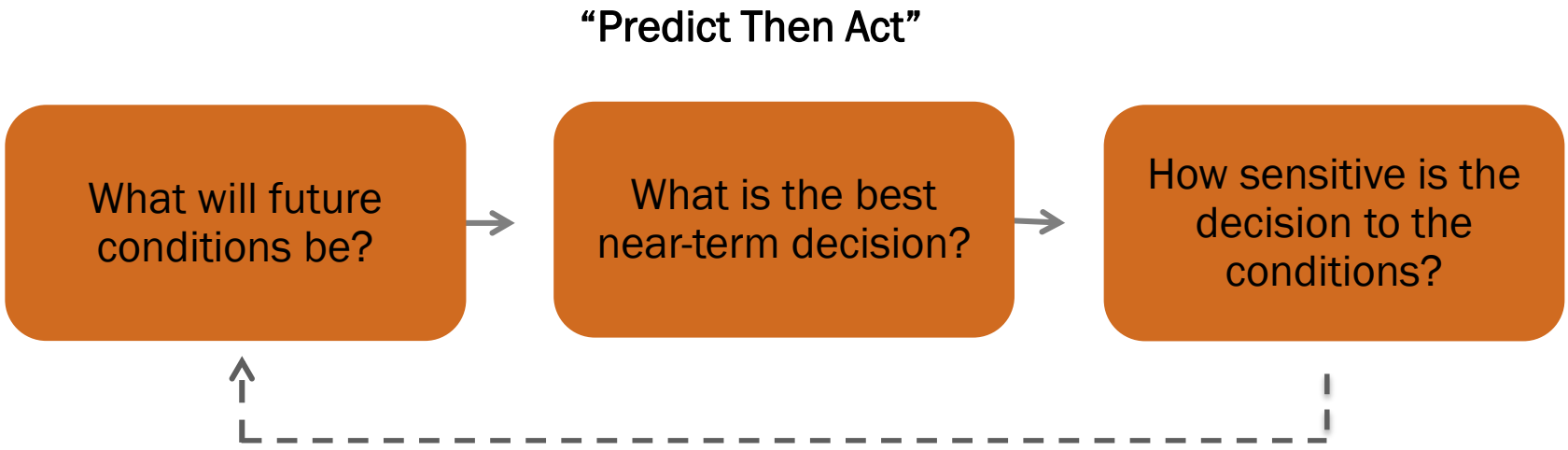
Uncertainty underlies almost every aspect of climate adaptation planning

- How might the **climate change**?
- How will **infrastructures** be affected?
- How might climate change **interact with other uncertainties** such as population shifts?
- How can we handle **large amounts of data** objectively?
- How do we know **which adaptation responses** are optimal?

Traditional decision methods are fine if we don't face much uncertainty



This traditional method provides a powerful approach for managing risk when the future:

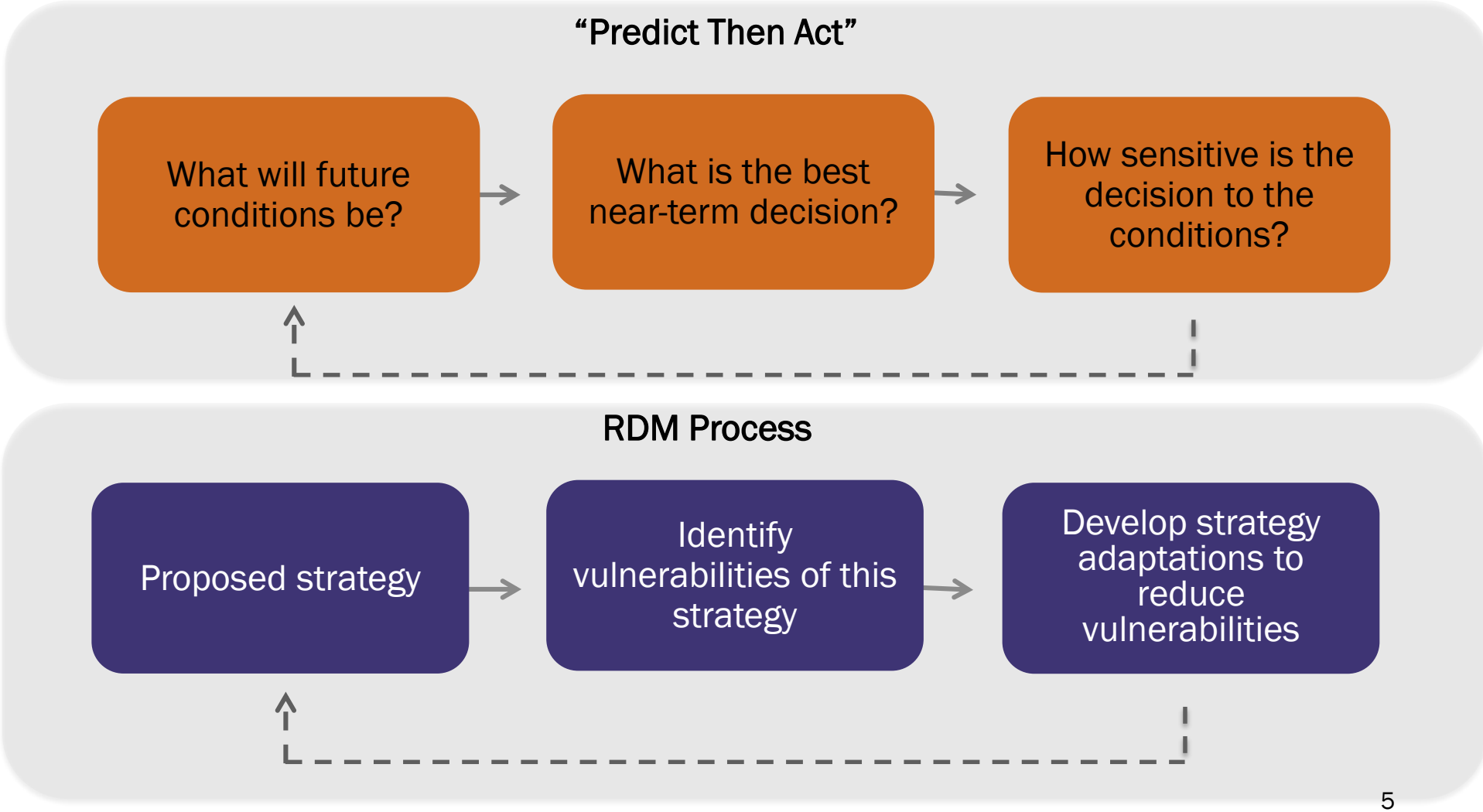
- Isn't changing fast
- Isn't hard to predict
- Doesn't generate much disagreement

Traditional decision methods can backfire in deeply uncertain conditions

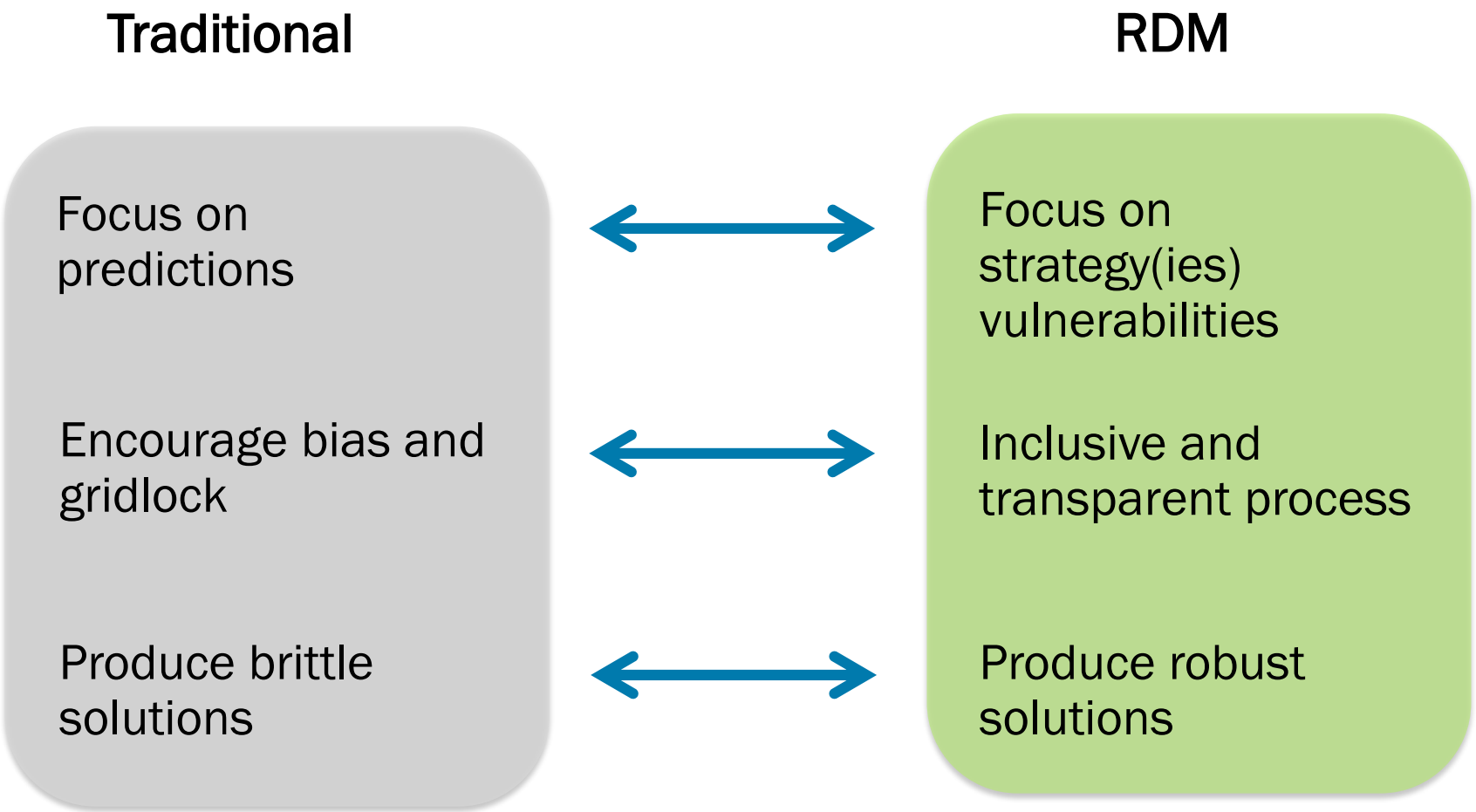
- Uncertainties are underestimated
- Competing analyses can contribute to gridlock
- Misplaced concreteness can blind decisionmakers to surprise

Source: momcat14c via Flickr C.C.

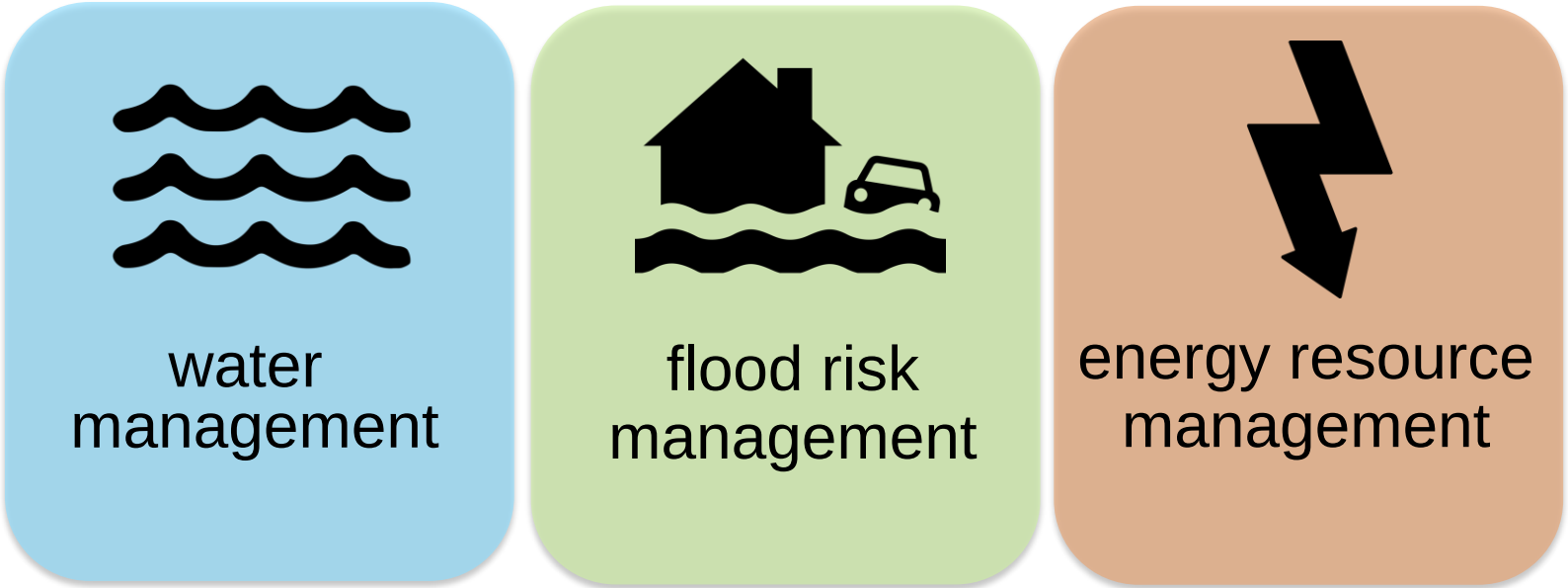
Robust Decisionmaking (RDM) works better under deeply uncertain conditions by running the analysis backwards



RDM works better than traditional decision methods under deep uncertainty

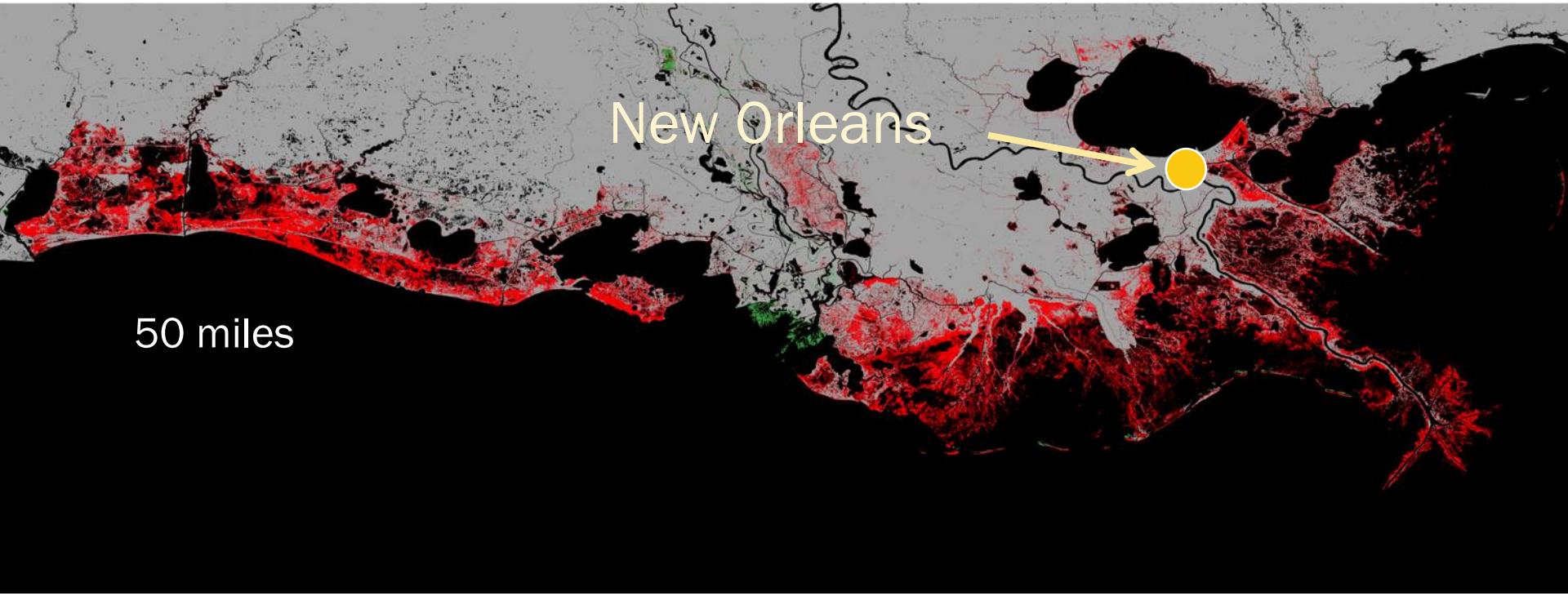


RDM has been used to improve decisionmaking in a number of different applied settings



Hurricanes Katrina and Rita spurred Louisiana into action in 2005

Unless Louisiana takes action, up to 1,800 square miles of land may be lost by 2061



Estimated land change over next 50 years without additional restoration or revised river management

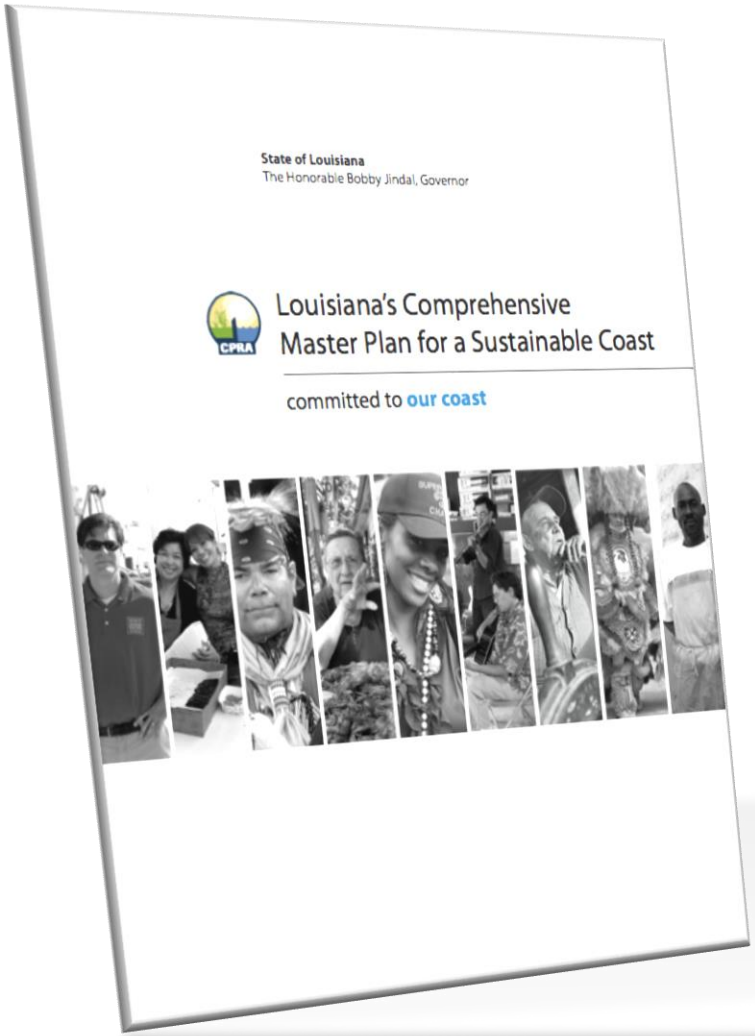
Land loss

Land gain

Louisiana exemplified coastal adaptation planning challenges

- Hundreds of costly projects proposed
- Diverse and conflicting goals in the region
- Significant uncertainty about the future
- Lack of science about future coastal change

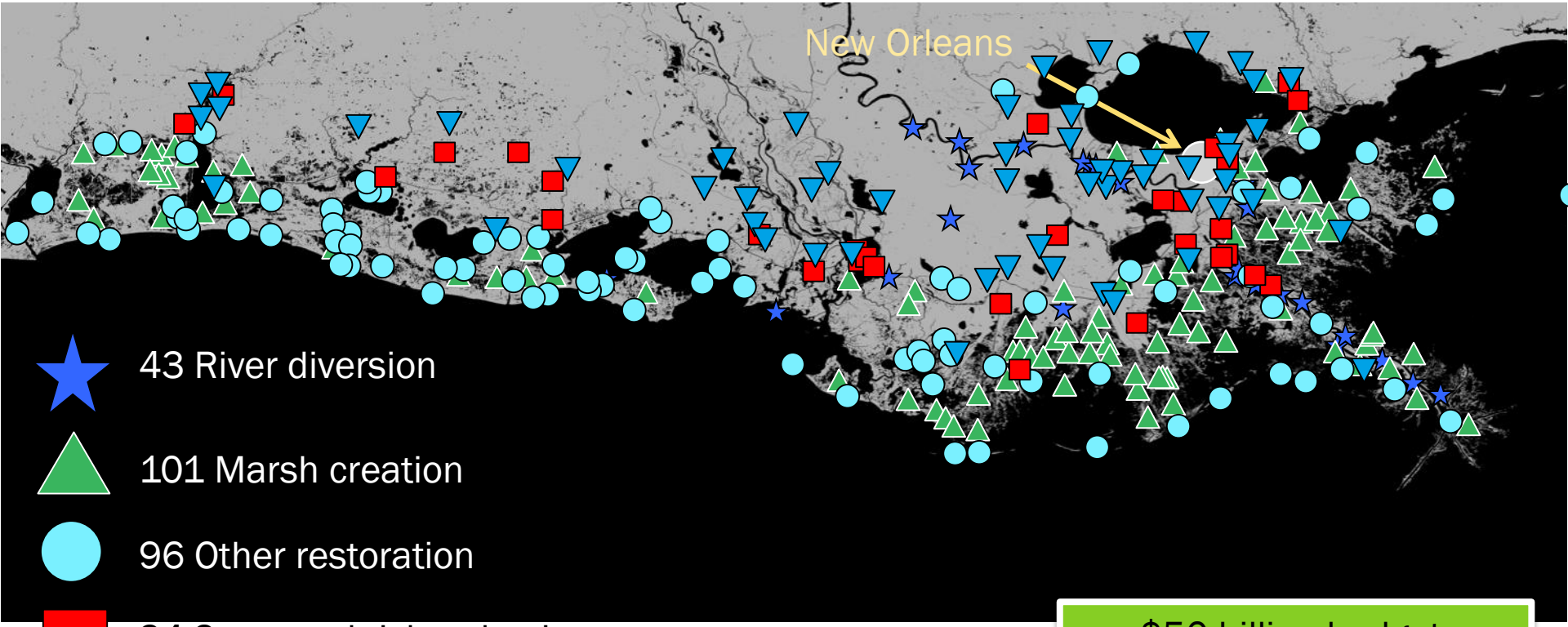
2012 Master Plan for a Sustainable Coast Proposes a Comprehensive Approach



Key innovations

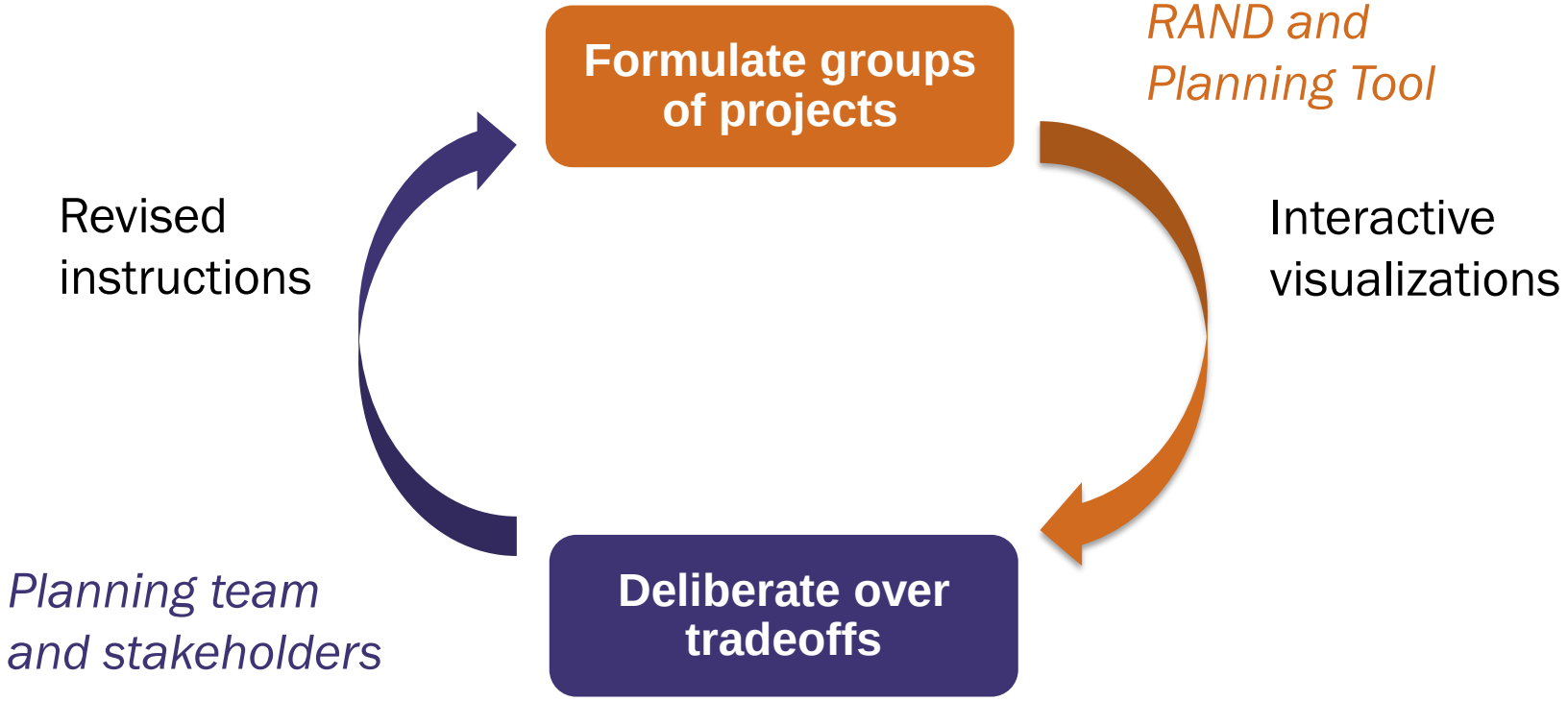
- *New systems modeling* to better understand future coastal conditions
- *Objective planning framework* to identify effective investments and tradeoffs

We developed a Planning Tool to compare hundreds of restoration and risk-reduction projects

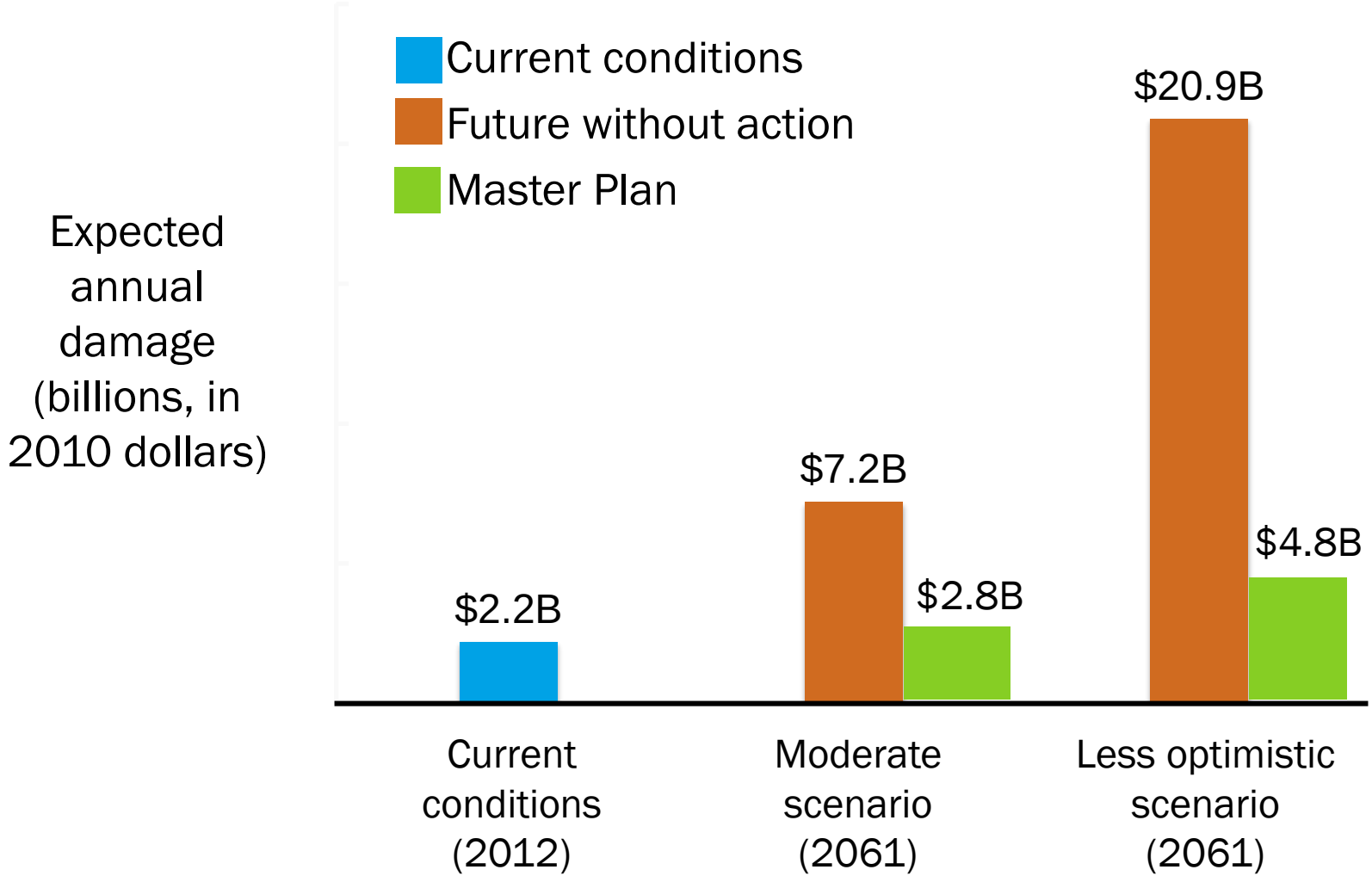


$50 billion budget; implementing all projects would cost more than $200 billion

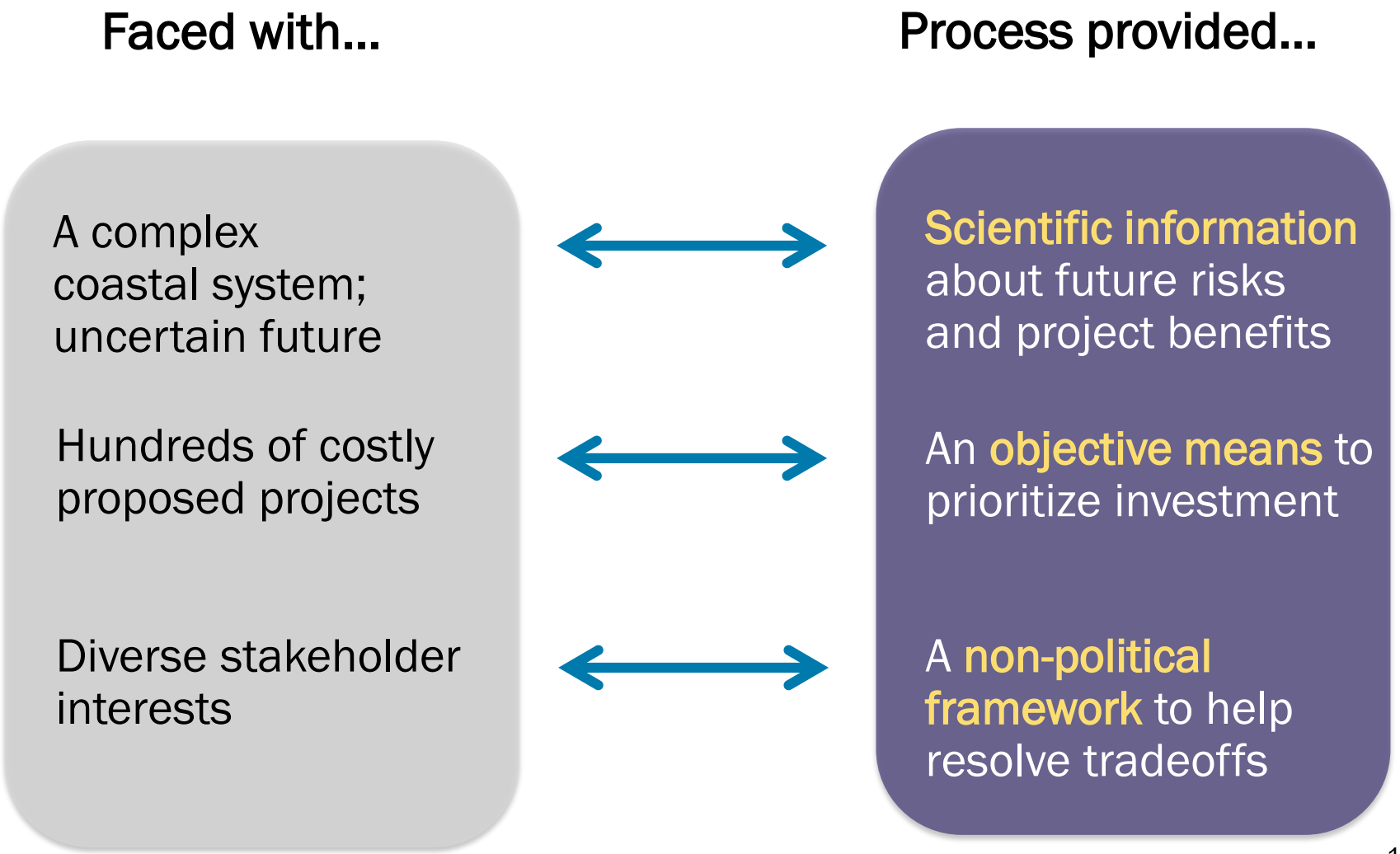
Master Plan Team used iterative approach to find balance of projects for 50-year, $50B plan



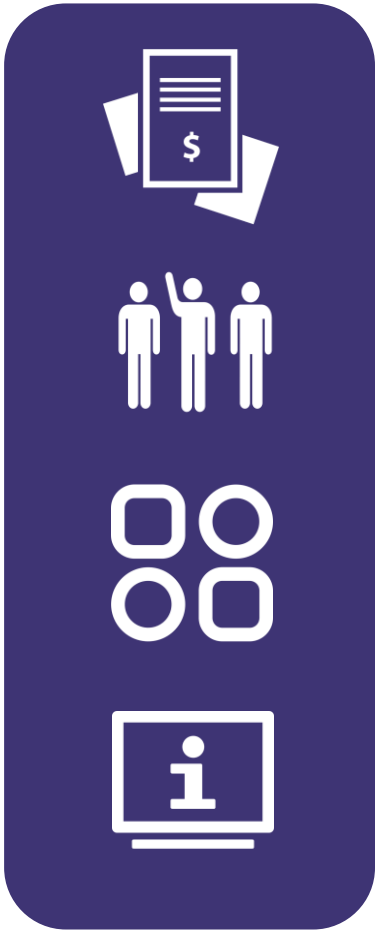
Risk reduction projects will reduce flood damage by billions of dollars annually



RDM-based approach allowed Louisiana to make difficult choices



Methods such as RDM can provide the analytical basis for more robust, adaptive decisions



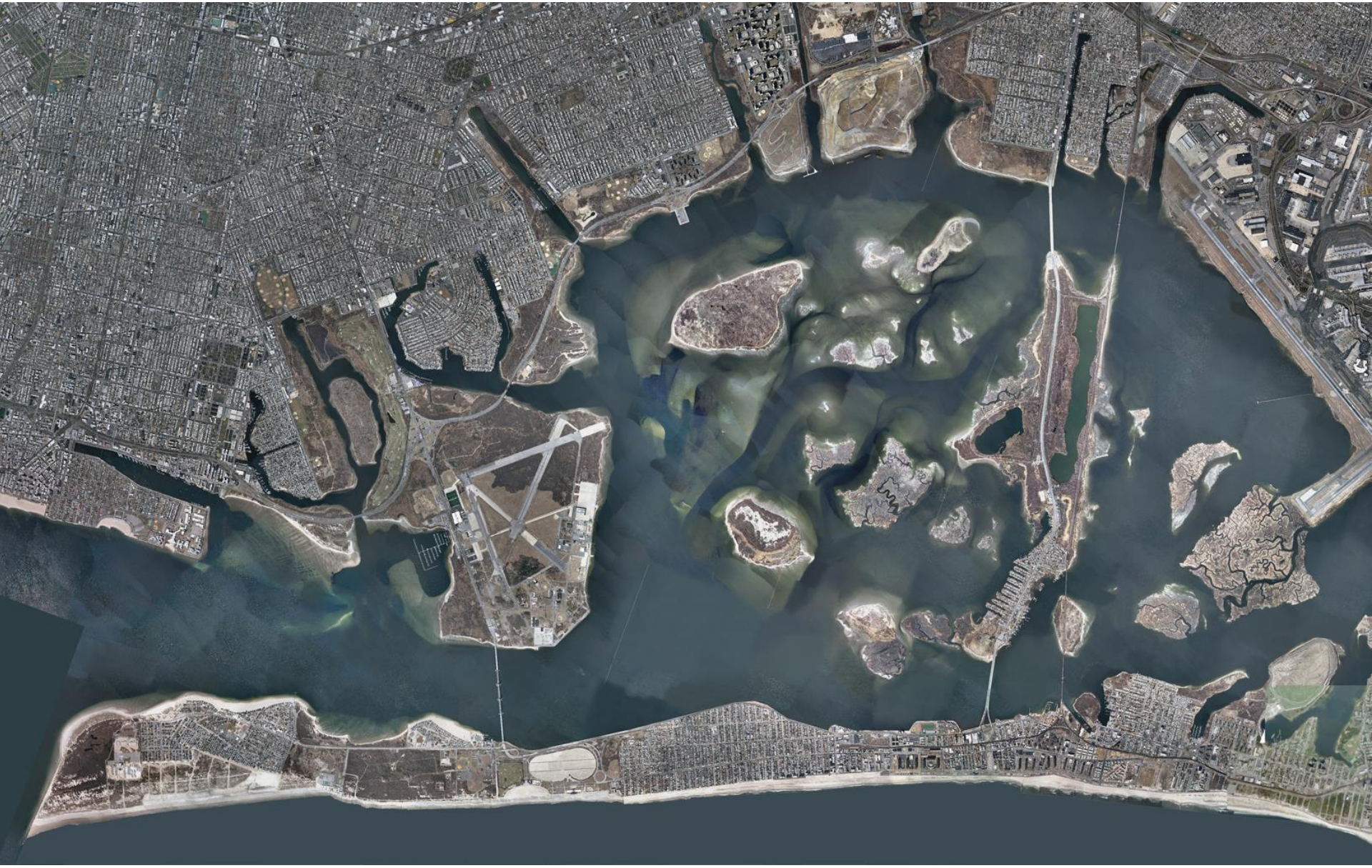
Highlight key assumptions, project benefits and costs, and tradeoffs

Support integrated, participatory adaptation planning

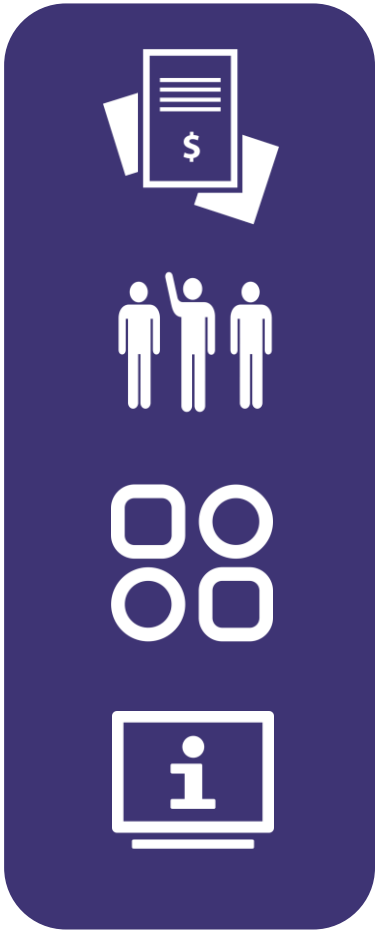
Expand the range of options under consideration

Develop adaptive plans that evolve as new information and insight emerges

We are applying this approach to Jamaica Bay with support from the Rockefeller Foundation



We will be helping to develop a Master Plan for Jamaica Bay that is robust and adaptive



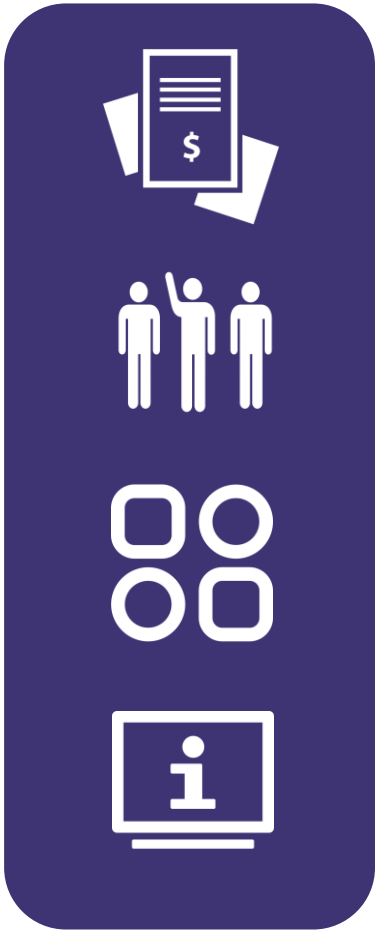
We will consider multiple goals of

- Coastal risk reduction
- Ecosystem restoration
- Water quality improvement

Key leaders: Public Agency Council of the Science and Resilience Institute of Jamaica Bay

12-18 month effort: deliberation with analysis

Principles for Integrated Coastal Planning

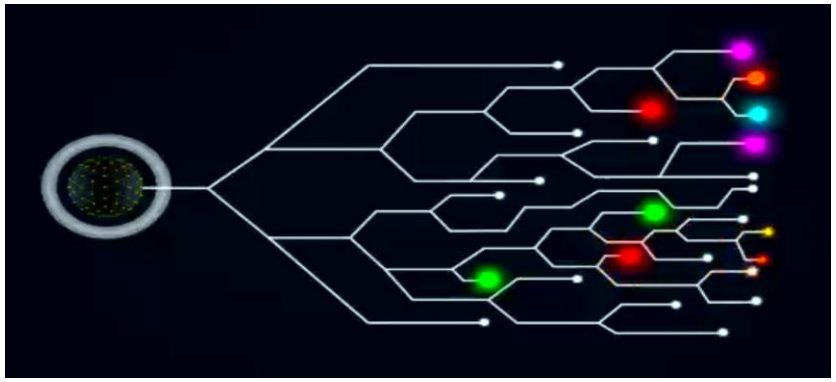


Public participation is essential throughout the planning process

Technical analysis is meant to inform deliberations and value judgments by decisionmakers

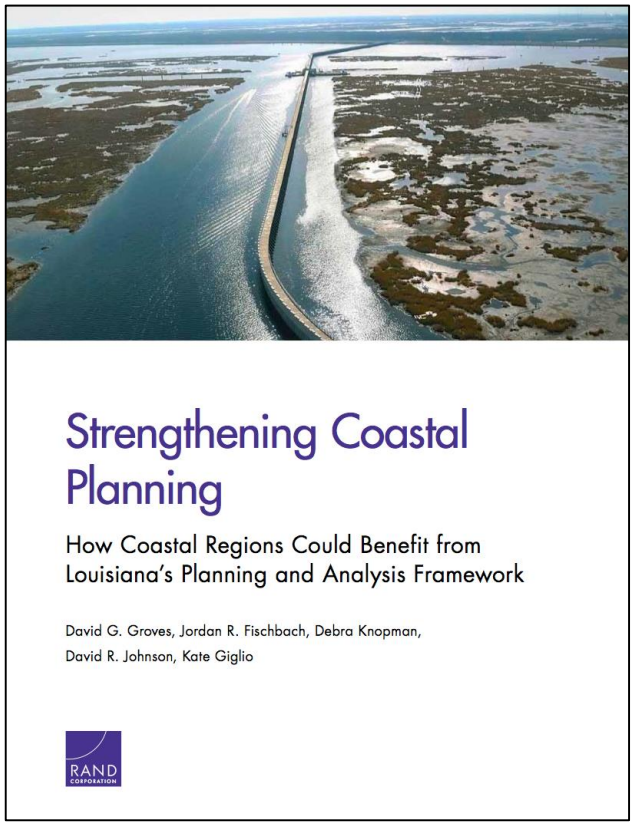
A sustainable long-term strategy must be robust and adaptive

You can review our adaptation-related work online



RAND's RDMlab
http://www.rand.org/methods/rdmlab.html

Colorado River Basin support
http://www.rand.org/jie/projects/colorado-river-basin/interactive-brief.html



2012 Louisiana Master Plan support
http://www.rand.org/pubs/research_/RR437.html

www.rand.org