

# Planning for Coastal Resilience

## Adaptive Risk Management for Sea Level Rise



“Climate change represents one of the greatest challenges of our time, with profound and wide-ranging implications for development, economic growth, the environment, and international security.”

– DOS Climate  
Action Report 2014



*Marstel-Day provides a range of services to support coastal resilience for clients, from enterprise-wide solutions to sustain your organization’s mission to individually tailored plans that address risks of sea level rise, storm surge, and increased flooding. Our coastal resilience toolkit utilizes an adaptive risk management framework to help you understand vulnerabilities, exposure, and risk; and provides recommendations and options for adaptation solutions that increase long-term resilience.*

### Coastal Risk

Marstel-Day brings many years of rich experience evaluating coastal vulnerability for a variety of worldwide clients. We employ high-resolution modeling with authoritative data and analysis techniques to measure coastal risks with a careful investigation of clients’ mission, operations, and exposure. Our toolkit includes distinct models for sea level rise, storm surge, and increased flooding that can accommodate different impact scenarios and temporal scales. Our risk assessment builds a full profile of vulnerabilities, including physical risk to facilities, infrastructure, and cultural resources; long-term natural capital risks due to wetland loss or migration; and community-based social and economic risks.

### Integrated Perspective

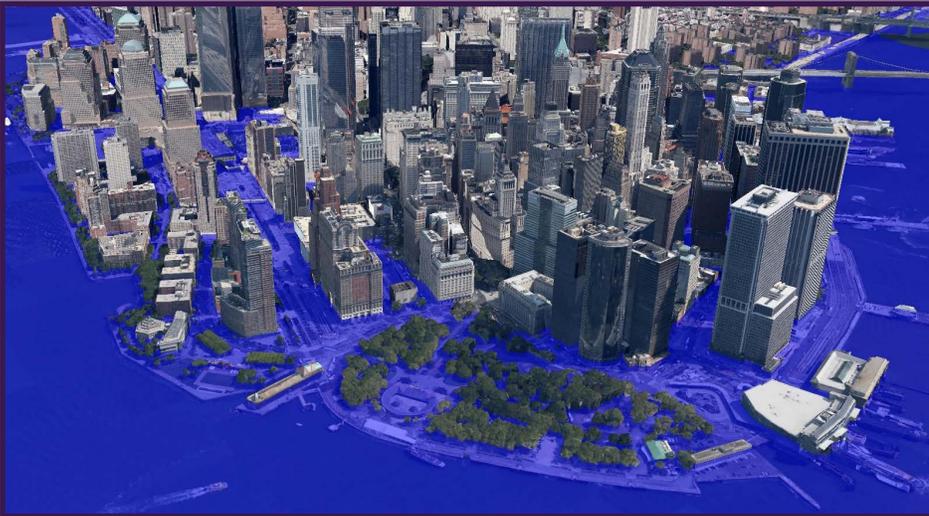
As part of our coastal vulnerability assessment, we work with you to understand your position in the local community, from host country policies down to facility-level analysis. We specialize in analyzing the connections your organization has to stakeholders and external drivers that are unique to your operations and location. The external network of dependencies and impacts is critical for evaluating climate risk. Our assessments delve into second- and third-order effects, like the impact of wetland migration on threatened and endangered species. Our methodology can be integrated into cross-functional assessments to fit naturally within your plans and processes and be scaled to fit your needs.

### Coastal Adaptation and Resilience

Once we identify risks, we work with our clients to provide adaptation strategies that include a range of options tailored to your needs. We perform cost-benefit analyses that compare potential solutions within a matrix of risk assessments and implementation costs. Recommendations may include developing protective services through infrastructure investments, working with local jurisdictions to develop land use tools that promote resilience, developing green infrastructure or conservation plans for storm surge buffering and habitat benefits, and identifying diverse partnerships and financing strategies for project implementation. Marstel-Day can assist with implementation strategies, especially if community engagement or partnerships are options for your organization. We provide tools for tracking your adaptation plans so that you can revise and extend your plan over time, with decision support systems customized to your operations and footprint.

## Dover AFB Coastal Resilience

Marstel-Day analyzed coastal vulnerability and partnership solutions for resilience for Dover AFB, with on-and off-base risks for storm surge and increased coastal flooding from the Delaware Bay. Our team engaged in a comprehensive regional sea-level rise and coastal vulnerability assessment by creating multiple temporal models for sea level rise and storm surge based on historic local tidal conditions, storm events, and relative sea level rise projects. We collaborated with the installation, local communities, and the Delaware Department of Conservation and Recreation to identify partnership solutions for emergency management planning efforts, infrastructure plans, and adaptation opportunities for increasing the resilience of built infrastructure and natural resources. We further identified a conservation partnership and funding strategy to conserve open spaces and wetlands that would help mitigate future flood impacts, reduce impervious surfaces, and stabilize local ecological conditions to buffer the installation against sea level rise.



### Sandy Storm Surge - Lower Manhattan Inundation

Sources: Google, Landsat, Marstel-Day

## Flexible Solutions

Marstel-Day has a wide variety of capabilities that we leverage as part of climate adaptation planning, including the following:

- **Coastal Vulnerability** – Our team of skilled geographers, GIS professionals and coastal climate analysts utilize risk modeling to deploy customized, scalable decision support systems.
- **Facilitation and Engagement** – Our team engages with your organization and other stakeholders to develop a coastal risk assessment tailored to your needs.
- **Adaptation Planning** – Our planners work with local jurisdictions and interested parties to craft locally appropriate and stakeholder-driven plans, policies, and guidelines.



Photo Courtesy of the U.S. Coast Guard

### Climate Change: A Real Threat

“76% of executives see bottom line risks from direct impacts of climate change”

– The Carbon Trust

### Marstel-Day: A Trusted Solution

“The relationships, processes and culture Marstel-Day has helped to foster... will be a game-changer...”

– US DOD Senior Official

**Contact us to build a sustainable future for your organization.**

## Contact information

**Jennifer L. Graham**

Partner

571-340-4097

[jgraham@marstel-day.com](mailto:jgraham@marstel-day.com)

**Phil Huber**

Partner

571-338-6218

[ph@marstel-day.com](mailto:ph@marstel-day.com)

For further information, visit:  
[www.marstel-day.com](http://www.marstel-day.com)

Or find us on the following social media sites:

