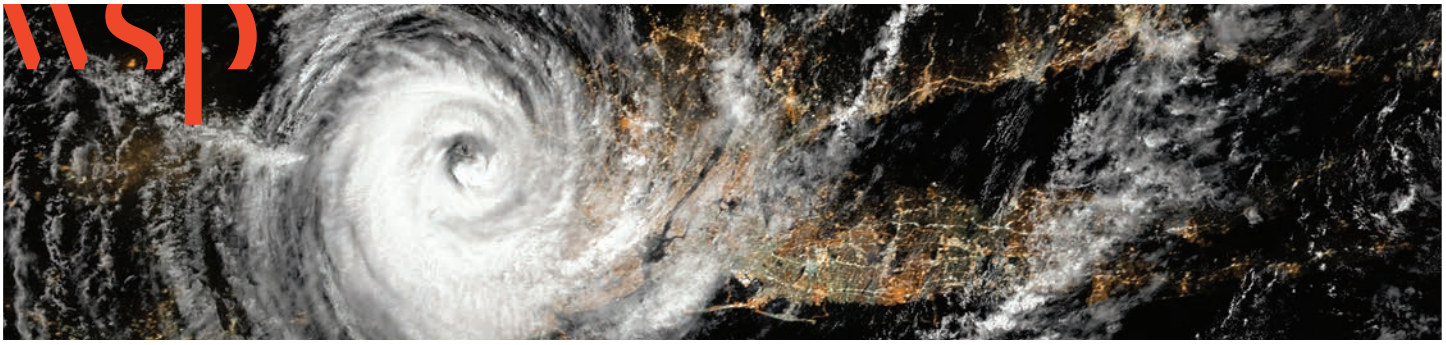

Climate Resiliency and Adaptation Planning

An interdisciplinary approach to assessing and managing climate risks

Our climate is changing and will significantly impact businesses, governments and economies in the near-term and for the foreseeable future. Now is the time for organizations to adapt and prepare for climate-related impacts.

WSP assesses organizations' climate change readiness and helps select the most cost-effective adaptation strategies that enhance resiliency and align with broader organization goals and culture. We provide these services to the private and public sectors, recognizing that each faces unique constraints, missions, stakeholders and opportunities. The holistic perspective of the WSP team includes experience in multiple sectors—buildings, energy and industrial activities, transportation and environmental compliance, and allows for coordination among the public and private sectors.

Our services

Our climate resiliency and adaptation planning services include:

- **Climate science review and synthesis:** Identifying and interpreting recent scientific data at the global, regional and local level to provide actionable guidance on those assets at risk and the likely hazards they face.
- **Hotspot analysis:** Overlaying climate stressors with critical facilities and functions to ensure that finite resources are directed at mitigating risks of highest value.
- **Vulnerability assessment:** Combining top-down scientific data with a bottom-up review of individual assets, dependence on vulnerable infrastructure and readiness for current and future hazards.
- **GIS mapping:** Providing visualization tools for capturing critical infrastructure, impacts of climate stressors and assessment of mitigation measures.
- **Hydrologic assessments:** Determining the water-related impacts from individual and combined changes in future precipitation levels, wind and sea-level rise on critical infrastructure.
- **Coastal flood protection and mitigation:** Characterizing and evaluating mitigation options for individual assets based on location, function and criticality.
- **Strategic planning, including benefit-cost analysis:** Assessing the likelihood and consequence of asset compromise due to climate stressors, comparing costs of various mitigation options including self-insurance, and developing resilience plans based on ranking of individual benefit-cost ratios.

Our vulnerability assessments and resiliency planning is complemented by related services in emission inventory management, mitigation strategies, public disclosure and supply chain engagement. We are well positioned to address issues across the evolving sustainability landscape.

Our experience

CLIMATE CHANGE READINESS REPORT FOR THE SACRAMENTO MUNICIPAL UTILITY DISTRICT (SMUD)

WSP assessed risks from climate change, and developed a strategic response to reduce vulnerability and increase climate preparedness. Our effort engaged internal stakeholders from power generation, grid planning, supply chain, local government and other departments; assessed the state of the science as it relates to projected local changes in temperature, precipitation, hydrology, wind patterns and fire risk; evaluated risks to hydro, wind and thermal generation potential, transmission and distribution infrastructure, load forecasting and emergency response; and identified strategies to reduce risks throughout the utility. WSP submitted the results as part of SMUD's report to the U.S. Department of Energy Partnership for Energy Sector Resilience.

STRATEGIC SUSTAINABILITY SUPPORT AND VULNERABILITY ASSESSMENT FOR A FINANCIAL SERVICES CLIENT

WSP assessed the risk associated with the physical impacts of climate change to the client's supply chain, operations and products and services. Our assessment began with a review of the most recent and credible science, divided into six U.S. regions. Once the impacts were identified, we began a review of risks to specific assets beginning in the southeastern U.S. and moving on to the northeast and then the Gulf Coast. Concurrently, the WSP team conducted a review of threats to key elements of the supply chain. Finally, after proof of concept on the company owned assets, we examined similar risks to their lending portfolio, starting with the oil and gas industry. Through this work, our client came to a preliminary understanding of risks to its portfolio, and the importance to their clients of managing these risks.

CLIMATE CHANGE IMPACTS VULNERABILITY ASSESSMENT FOR A TECHNOLOGY CLIENT

WSP examined the threats to company facilities and product supply chain. Work began with identification of critical facilities and a hot spot analysis overlaying climate impacts with those critical facilities. Our team performed desk studies of those facilities, accompanied by site visits to a stratified sub-sample of facilities identified in the hot spot analysis. Upon completion of the facilities analysis, WSP undertook a similar process for the company's product supply chain, with quantification of value at risk and recommendations for mitigation or transfer of risk. This work helped inform improvements to current risk management processes and triggered the incorporation of additional risks into future site selection for this rapidly growing company.

BRONX WHITESTONE, THROGS NECK ROBERT F. KENNEDY BRIDGE FACILITIES AND THE ROBERT MOSES BUILDING

WSP performed an extensive Flood Protection Mitigation Study for the NYC MTA Bridges and Tunnels at four facilities: Bronx-Whitestone Bridge Facility; Robert Moses Administration Building, RFK Triborough Bridge Facility and the Throgs Neck Bridge facility. The study consisted of an extensive inventory and prioritization of over 6,000 pieces of infrastructure deemed vulnerable under climate change induced floods; performing hydraulics necessary to provide a recommended flood protection elevation; and developing a matrix of conceptual level flood mitigation measures with budgetary costs. Data were collected and catalogued using a ESRI GIS database compatible with NYCMAP datasets. WSP then prepared a web-based GIS deliverable that provided the Authority with a usable asset management tool for facility engineers.

ABOUT WSP

WSP USA is the U.S. operating company of one of the world's leading engineering and professional services firms—WSP. Dedicated to serving local communities, we are engineers, planners, technical experts, strategic advisors and construction management professionals. WSP designs lasting solutions in the buildings, transportation, energy, water and environment sectors. With more than 7,000 people in 100 offices across the U.S., we partner with our clients to help communities prosper.

Our multidisciplinary sustainability, energy and climate change team has been providing related services for two decades. We support clients across sectors by providing strategy and planning, as well as operational and technical expertise. We are passionate about contributing to our clients' successes through our depth of expertise, collaborative approach and unique perspective on the market.

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