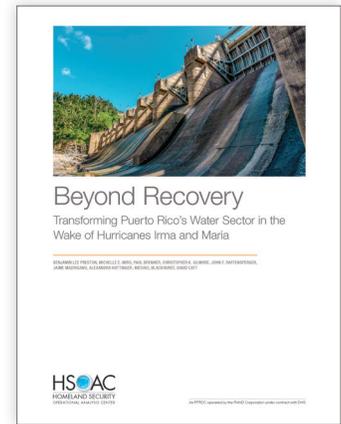


# Beyond Recovery: Transforming Puerto Rico's Water Sector in the Wake of Hurricanes Irma and Maria



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The 2017 hurricanes damaged Puerto Rico's water infrastructure and its water resources. This damage was attributed to existing vulnerability of infrastructure, direct hurricane damage, and indirect disruption stemming from damage in other sectors. The water sector recovery plan involves not only repairing hurricane-damaged structures and systems but also fixing the many legacy challenges in the water sector's operations and governance.

## RESEARCH QUESTIONS

- What damage did Puerto Rico's water sector experience from Hurricanes Irma and Maria?
- How did infrastructure and management conditions prior to the hurricanes influence the extent and severity of damage?
- Which key vulnerabilities and legacy challenges in Puerto Rico's water sector can be addressed through the recovery process?
- What concrete actions in the recovery process are needed to improve the performance and governance of the water sector and make it more resilient to future extreme events?

## KEY FINDINGS

### **Pre-storm conditions in Puerto Rico's water sector enhanced damage and slowed down recovery efforts**

- Financial stress was an underlying legacy challenge to the resilience of water and wastewater systems in Puerto Rico.
- Puerto Rico's water infrastructure had a history of system depreciation, underinvestment, lack of maintenance, and incomplete monitoring.
- Disparities in the equity of provision of various water sector services, including drinking water, wastewater, and stormwater services, meant that communities recovered at different rates.

## **There are high interdependencies among the water sector and other infrastructure sectors**

- The fragility of the electrical grid in Puerto Rico, the complete loss of electrical power, and its slow rate of recovery caused major disruption of the water and wastewater subsectors. Extensive debris created by Hurricane Maria damaged road networks and made the initial assessment of damage to water infrastructure and assets difficult and slowed down the distribution of emergency water services to some remote populations.
- The hurricanes strained the government of Puerto Rico's human capital. Response and recovery efforts in the water sector were limited by the size of the workforce of qualified water engineers and technicians.

## **RECOMMENDATIONS**

- Implement recommended courses of action for a more resilient long-term recovery of the water sector in Puerto Rico.
- Upgrade the water sector's physical infrastructure assets and operational systems to harden them against future extreme events and improve their long-term performance.
- Improve equity in access to and quality of water services with recovery efforts that address the needs of all water sector stakeholders and communities, including those in both urban and rural areas and in disadvantaged populations.
- Build capacity of water sector management organizations and personnel to improve operational efficiency, governance, and contingency planning and to grow a skilled water sector workforce.
- Increase public trust in water services and management agencies by engaging the public in the recovery process and with ongoing education and outreach programs.
- Enhance electricity reliability and lessen dependence on the grid by installing backup power supplies at water sector facilities.
- Improve situational awareness of water sector assets and use performance metrics to provide early warning of problems and accelerate emergency responses.
- Reconcile the operations and management of shared water infrastructure systems to improve short- and long-term management, as well as emergency response.
- Restore and protect the health and availability of the water sector's natural assets by promoting healthy watershed, sustainable water resources management and implementing and enforcing water quality programs.