



# SECURE TOMORROW SERIES CROSS-IMPACTS READ AHEAD: WATER AVAILABILITY



## CROSS-IMPACTS SESSION

In this facilitated activity, participants will brainstorm how seven drivers of change for water availability might affect eight [National Critical Functions \(NCFs\)](#).<sup>1</sup> Specifically, participants will identify critical infrastructure<sup>2</sup> risks related to water availability that they expect to see in the next three to seven years, determine which risks are unique to individual NCFs or specific critical infrastructure systems, and identify strategies to mitigate those risks.

**No advance preparation is necessary.** However, participants may wish to familiarize themselves with the drivers of change and NCFs that they will be “crossing” during the session. The intersection of a particular driver of change and NCF (i.e., what risks the driver of change poses to that NCF) forms the basis for discussions during the activity. Ultimately, participants will select six of these intersection points to focus on, based on a prioritization exercise at the start of the session.

Table 1 lists and briefly describes the seven drivers of change that participants will choose from during the session.

**Table 1: Drivers of change addressed in the cross-impacts session**

Driver of Change	Description
<b>Aging infrastructure</b>	Includes the vulnerabilities arising from aging water infrastructure and chronic underinvestment in water infrastructure
<b>Climate change</b>	Includes how altered historical weather patterns can stress water quantity and quality and damage water infrastructure
<b>Competition for water resources</b>	Includes the challenges arising from water resources often being geographically diffused and over-allocated, leading to competition among jurisdictions, industries, residents, and environmental groups
<b>Cybersecurity</b>	Includes widespread vulnerabilities in the water and wastewater sector, which has a large attack surface and fewer cybersecurity regulations compared to other sectors
<b>Emerging contaminants</b>	Includes risks and complications arising from the emergence and increasing prevalence of various contaminants (e.g., harmful algal blooms, microplastics, perfluorinated compounds, pharmaceuticals)
<b>Food, energy, water nexus</b>	Includes the ramifications of competition between the agricultural and energy sectors for water resources

<sup>1</sup> NCFs are those functions of government and the private sector so vital to the United States that their disruption, corruption, or dysfunction would have a debilitating effect on national security, national economic security, national public health or safety, or any combination thereof.

<sup>2</sup> For a complete list and description of the 16 critical infrastructure sectors, see [www.cisa.gov/critical-infrastructure-sectors](http://www.cisa.gov/critical-infrastructure-sectors).

<b>Groundwater mismanagement and drawdown</b>	Includes over-allocation of groundwater resources with corresponding contamination, land subsidence, and infrastructure costs
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Table 2 provides definitions for the eight NCFs addressed in the session. For additional information on all 55 NCFs, participants may wish to review [National Critical Functions: Status Update to the Critical Infrastructure Community](#).

**Table 2: NCFs addressed in the cross-impacts session**

National Critical Function	Definition
<b>Exploration and Extraction of Fuels</b>	Identify resources and collect energetic materials (including fossil fuels, nuclear materials, and others)
<b>Generate Electricity</b>	Produce electricity from a variety of primary energy sources (including fossil fuels, nuclear materials, and renewables) to reliably meet demand
<b>Maintain Supply Chains</b>	Manage and sustain the networks of assets, systems, and relationships that enable the movement of goods and services from producers to consumers
<b>Manage Wastewater</b>	Collect and treat industrial and residential wastewater to meet applicable public health and environmental standards prior to discharge into a receiving body
<b>Produce and Provide Agricultural Products and Services</b>	Grow and harvest plant and animal commodities (including crops, livestock, dairy, aquaculture, and timber) and produce inputs required to support agricultural production (such as fertilizers, pesticides, animal food, crop seeds, and veterinary services)
<b>Supply Water</b>	Maintain availability of water (raw and treated)
<b>Support Community Health</b>	Conduct epidemiologic surveillance, environmental health, migrant and shelter operations, food establishment inspections, and other community-based public health activities
<b>Transport Cargo and Passengers by Vessel</b>	Provide and operate maritime systems, assets, and facilities to enable a system of securely and safely conveying goods and people from place to place by the Maritime Transportation System

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