ACCLIMATE

Extreme Weather Critical Infrastructure Resilience Modeling Tool

ACCLIMATE aims to produce a comprehensive risk and resilience measurement based on climatological hazards, asset susceptibility, and consequence measures.

ACCLIMATE is a software tool that helps electric utilities and other energy sector partners assess risk to their electric power systems from extreme weather based on system architecture, system assets and components and current and projected environmental conditions. The work is funded by the U.S. Department of Energy Office of Cybersecurity, Energy Security, and Emergency Response (CESER) and aims to strengthen the electric grid.

Designed as a modular platform, ACCLIMATE integrates extreme-weather science, infrastructure vulnerability and economic modeling. Developed for utilities, planners, and policymakers, ACCLIMATE bridges the gap between advanced extreme weather datasets and actionable decision support by translating environmental risk into asset-level impact and cost estimates.

At its core, ACCLIMATE is a web-based tool that pairs future environmental conditions with asset locations and component-level susceptibility analysis to produce electric power risk assessments at the system, asset and component levels. Users can input asset-level electric power system data and receive risk-based information regarding the severity and frequency of specific natural hazards and extreme weather events over time, the susceptibility of failure or degradation of assets and systems to extreme weather events, and the consequence of failure for assets and components.

The tool supports a broad range of stakeholders involved in infrastructure-risk assessment and resilience including asset owners and operators responsible for planning, developing, and managing electric power systems and technical professionals tasked with managing infrastructure performance under current and future weather conditions.

ACCLIMATE provides a modular approach to risk analysis, allowing users to customize model parameters for threat, vulnerability and consequence analysis to produce tailored assessments that meet organizational goals.

APPLICATION

ACCLIMATE allows operators of electric power systems and

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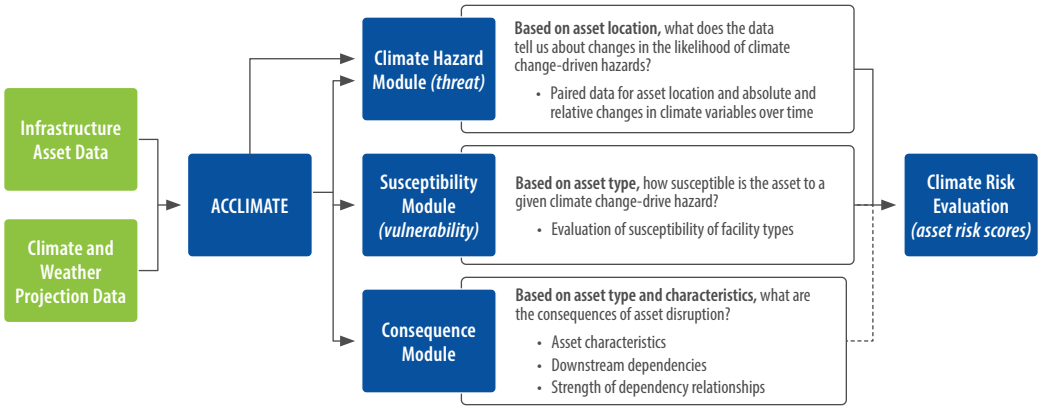

ACCLIMATE uses asset-based Hardware Bill of Materials to conduct component-level susceptibility analysis.

other critical infrastructure to input information on their system operations and asset inventory and receive results that show:

- How extreme weather and specific hazards are projected to change over time in their operational area, including which areas may incur more frequent or severe weather events.
- What assets and componentry are likely to fail during such extreme weather events.
- How asset and componentry failure may impact system operations through powerflow modeling.
- What to expect in terms of monetary loss given the probability of infrastructure failure and replacement costs caused by extreme weather events.
- How the failure of a given asset will impact other critical infrastructure systems serving the target area.
- The options for hazard mitigation and improving response, recovery, and future planning.

ACCLIMATE utilizes asset-based HBOMs to conduct component-level susceptibility analysis.

Battelle Energy Alliance manages INL for the U.S. Department of Energy's Office of Nuclear Energy.

FOR MORE INFORMATION

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QUICK FACTS

ACCLIMATE uses acute and chronic weather projections, powerflow modeling and fragility curves to produce:

1. Projected changes in the severity and frequency of specific natural hazards over time.
2. Forecasts of physical asset loss and damage using hazard-specific fragility curves.
3. Financial impact estimates for asset and component loss.
4. Recommendations to enhance asset and system resilience.