To provide essential insights for decision makers in global security, Argonne brings together climate modeling, environmental analyses, infrastructure science, and agent-based social modeling. This combined expertise can enhance global security by predicting risks to critical systems, guiding intervention options, and reducing uncertainty to achieve better decisions.

ENVIRONMENTAL SCARCITY

Climate and Environmental Extremes
- Projected shifts in rainfall and runoff
- Extreme heat and drought
- Environmental and health impacts
- Predicting risk and characterizing uncertainty

Water, Food, and Energy Scarcity
- Surface and groundwater modeling
- Land and crop modeling
- Effects on energy production

Environmental Sensors and Forecasting
- Radar climatology
- Climate modeling and weather forecasting
- Remote sensing and data analytics
IMPACTS TO URBAN SYSTEMS

Critical infrastructure
- Understanding how rapidly growing populations stress urban infrastructures
- Interdependencies of water, energy, transportation, and communications systems
- Power grid modeling and resilience

Urban science
- Impacts of rapid urbanization and planning for megacities
- Harnessing real-time sensor networks and machine learning

Climate, migration and conflict
- Effect of climate and scarce resources on mass migration and conflict
- Agent-based modeling to predict social dynamics, from regional migration to the “next Syria”

Infectious disease outbreaks
- Impact of climate, population densification and mobility on pathogens and disease vectors, increasing threats of food-, water- and vector-borne diseases
- Agent-based modeling to characterize exposure vulnerabilities and disease risks
- Analysis and modeling to guide preventive interventions for destabilizing disease outbreaks and pandemics

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