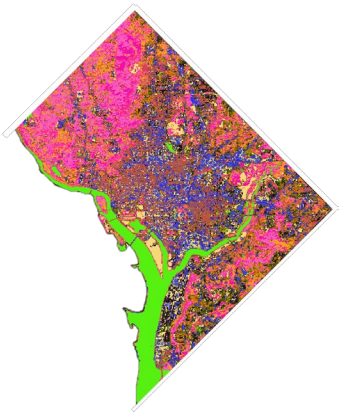
NATIONAL ACADEMIES Sciences Engineering Medicine

GEOGRAPHICAL AND GEOSPATIAL SCIENCES COMMITTEE

GeoAI and the Future of Mapping:

Implications for 21st-Century Digital Resilience



MONDAY, MAY 22, 2023

Geospatial science and technologies can be core to forging a path toward resilience. New innovations in digital data collection, spatial analysis and geovisualization now allow us to map and understand human impacts at global to local scales, to identify big-picture patterns and processes and to generate actionable geographic knowledge. However, if new geospatial mapping and tools are to help communities, the tools must also be resilient. **Digital resilience** means that to the greatest extent possible, the data and tools that communities use to build resilience should be freely accessible, up-to-date, interchangeable, operational, explainable and principled in the sense that they are consistent with theory and settled science.

This meeting of the Geographical and Geospatial Sciences Committee will address the implications of the future of mapping for digital resilience, with a specific focus on perhaps the most promising and yet disruptive of digital technologies for this future: geo artificial intelligence or geoAI. **GeoAI** is the integration of location, spatial relations, and place to the broader paradigm of AI, and exists for the purposes of automating the understanding and prediction of spatial patterns, tendencies, and relationships; and for predicting the location of future behaviors, events, or trends. Can we leverage these new advances in geospatial science and technologies to build greater digital resilience, and ultimately community resilience, to the shocks and disruptions that will occur in a world facing accelerating change?

EASTERN TIME

11:00–11:10am Welcome

Pat McDowell and **Harvey Miller**, Co-Chairs, Geographical and Geospatial Sciences Committee

11:10–12:30pm Digital Resilience in the 21st Century

Dawn Wright (NAS, NAE), Chief Scientist, Environmental Systems Research Institute

Discussants:

- **Trisalyn Nelson**, Professor of Geography, UC Santa Barbara
- **Renee Sieber**, Associate Professor of Geography, McGill University
- **Shaowen Wang**, Professor of Geography and Geographic Information Science, University of Illinois Urbana-Champaign

Moderator: **Kristen Kurland**, Member, Geographical and Geospatial Sciences Committee

12:30–1:30pm Lunch Break

1:30–2:45pm Opportunities and Risks of GeoAI for Digital Resilience

Panelists:

- **Yiqun Xie**, Assistant Professor of Geospatial Information Science, University of Maryland

- **Xiaoxiang Zhu**, Professor in Signal Processing in Earth Observation, The Technical University of Munich
- **Song Gao**, Associate Professor of Geography, University of Wisconsin
- **Bo Zhao**, Associate Professor of Geography, University of Washington

Moderator: **Hendrik Hamann**, Member, Geographical and Geospatial Sciences Committee

2:45–3:00pm **Break**

3:00–4:15pm **Resilient GeoAI – Exemplars for Basic and Applied Science**

Panelists:

- **Manil Maskey**, Senior Research Scientist, National Aeronautics and Space Administration
- **Catherine D'Ignazio**, Associate Professor of Urban Science and Planning, Massachusetts Institute of Technology
- **Andrew Turner**, Director, Environmental Systems Research Institute R&D Center DC
- **Aaron Burciaga**, Senior Practice Manager, Amazon Web Services

Moderator: **Oceana Francis**, Member, Geographical and Geospatial Sciences Committee

4:15–4:30pm **Wrap-up**

- **Harvey Miller**, Co-Chair, Geographical and Geospatial Sciences Committee