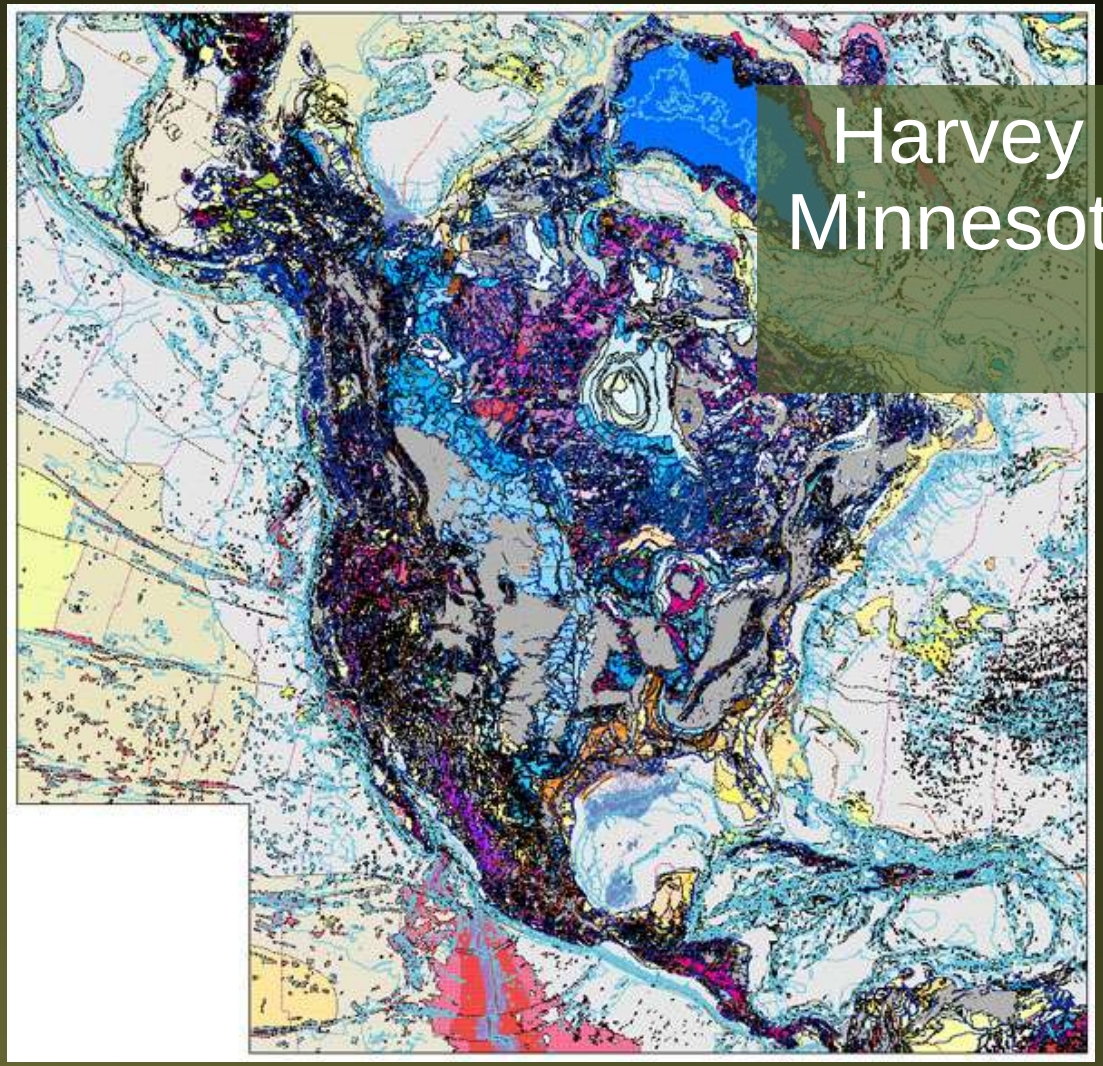

Harvey Thorleifson, Director,
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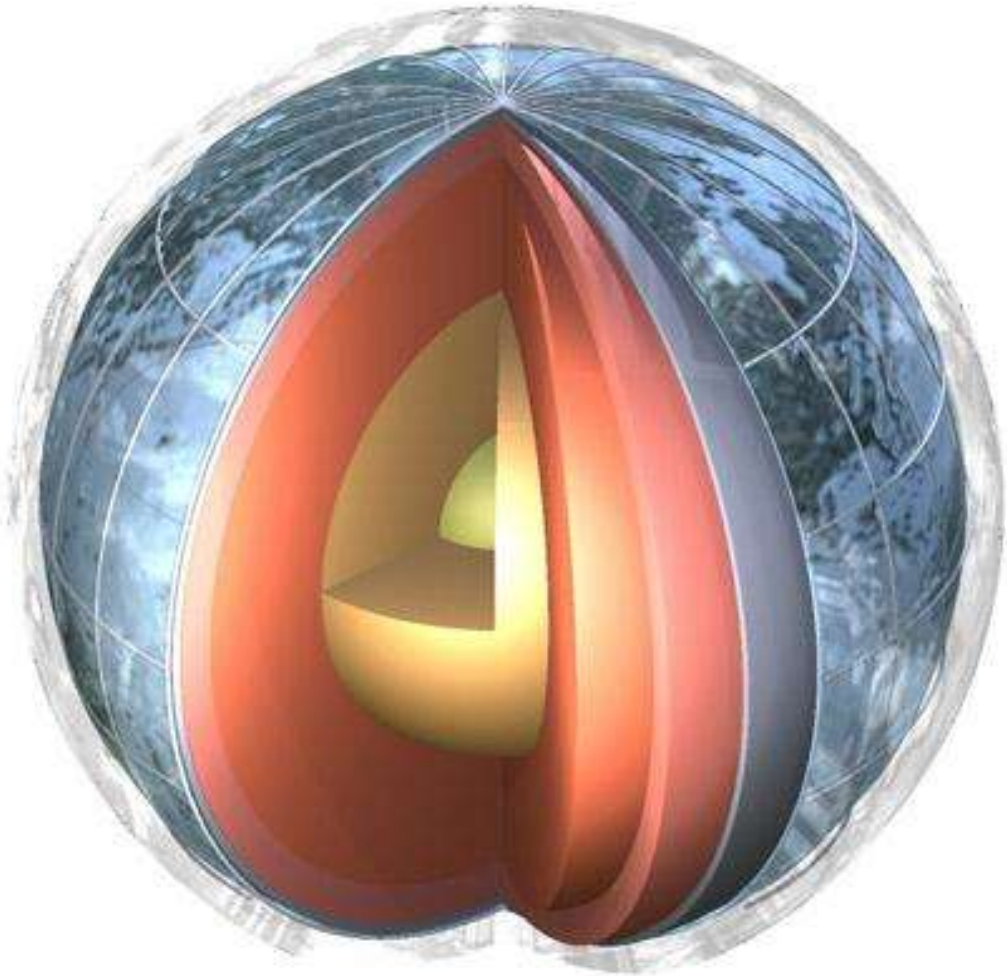
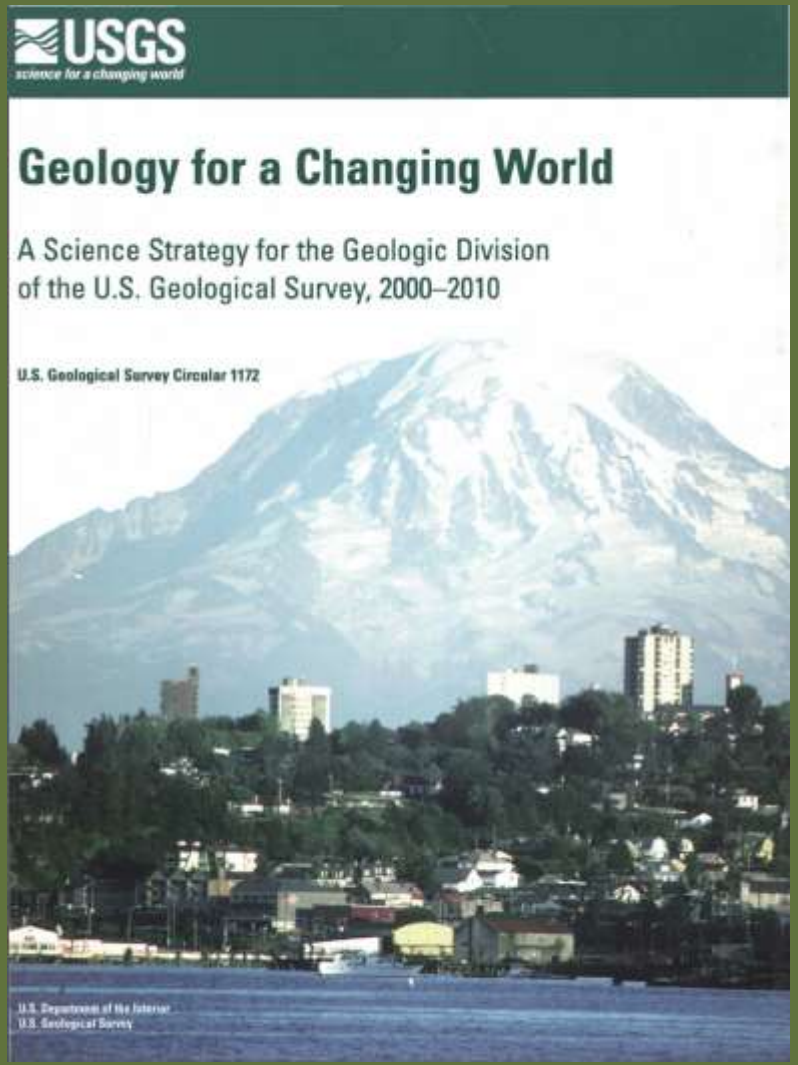
NGAC April 3 2018

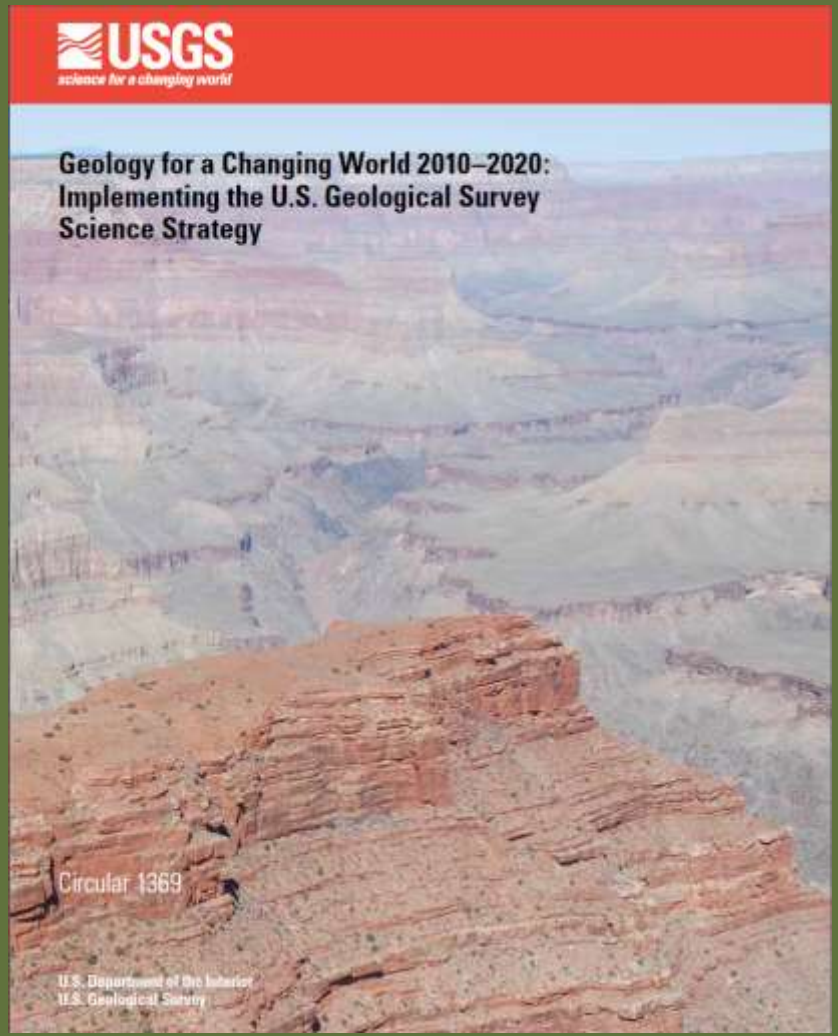
National 3D Geology – a rapidly emerging concept



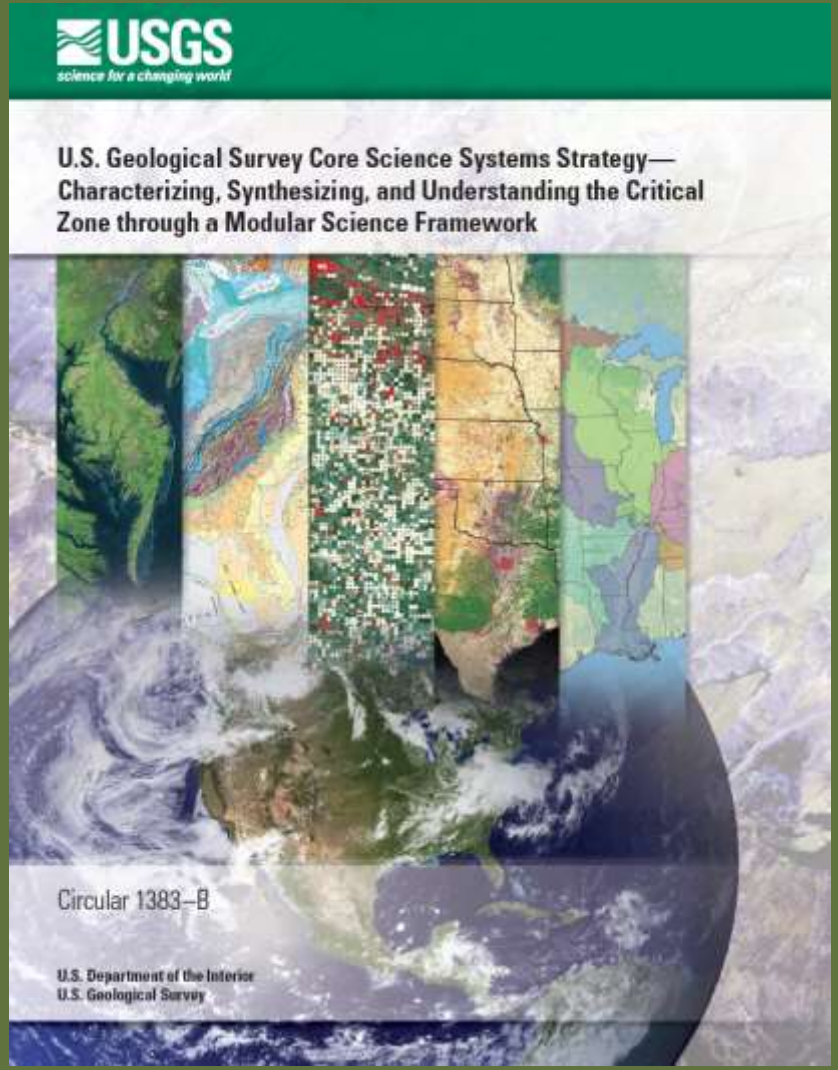
Energy
Minerals
Water
Hazards
Environment
Waste
Infrastructure
Research



1998: The 2000-2010 plan for USGS geology cited the need for basin-scale, nationally consistent maps showing the 3D distribution of hydrogeologic properties



2011: The 2010-2020 plan for USGS geology called for development of the interpretations, protocols, and standards needed to provide seamless geological maps, while foreseeing that 3D geologic maps of continental and offshore areas will become the standard



2013: The most recent USGS planning called for collaboration leading to 1) seamless nationwide geological maps, 2) 3D maps that will for example improve understanding of sedimentary basin processes, and 3) 4D modeling that will elucidate the operation of processes through time

From August 9th to 11th, 2016, the NCGMP Decadal Strategic Planning Workshop was chaired by John Brock

2018 – 2027 Decadal Strategic Plan for the National Cooperative Geologic Mapping Program

Renewing the National Cooperative Geologic Mapping Program as the Nation's Authoritative Source for Modern Foundational Geologic Knowledge

Authored By:

Karen Berry[1], John Brock[2], James Faulds[3], Kyle House[4], Michael Marketti[2], Darcy McPhee[2], Kevin Schmidt[5], James Schmitt[6], David Soller[2], David Spears[7], Ren Thompson[8], Harvey Thorleifson[9] and Gregory Walsh[10]

Affiliations:

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8: Geosciences & Environmental Change Science Center, USGS, DFC, Denver, CO 80225
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10: Eastern Geology and Paleoclimate Science Center, USGS, Montpelier, VT 05602

The Decadal Plan was completed in May 2017

NCGMP Decadal Strategic Plan:

Vision: a national, consistent, 3D digital geologic framework by the year 2030

Goals:

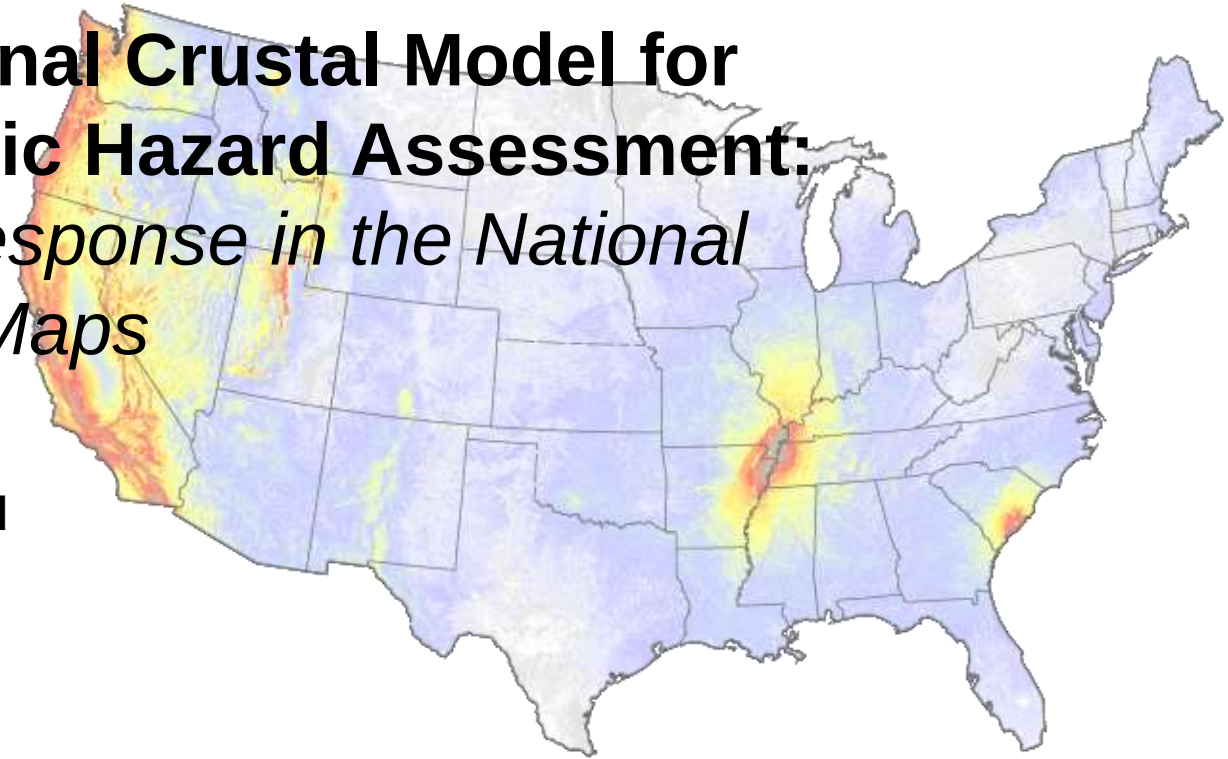
- *Goal #1* - excellence in NCGMP performance, with maximized beneficial partnering
- Goal #2 - preeminence in field, remote sensing, and geophysical technologies
- *Goal #3* - a national, consistent, 3D digital geologic framework database

USGS
science for a changing world

Earthquakes ★ Floods ★ Hurricanes ★ Landslides ★ Tsunamis ★ Volcanoes ★ Wildfires

The USGS National Crustal Model for Improved Seismic Hazard Assessment:

Priority 1) Site Response in the National Seismic Hazard Maps

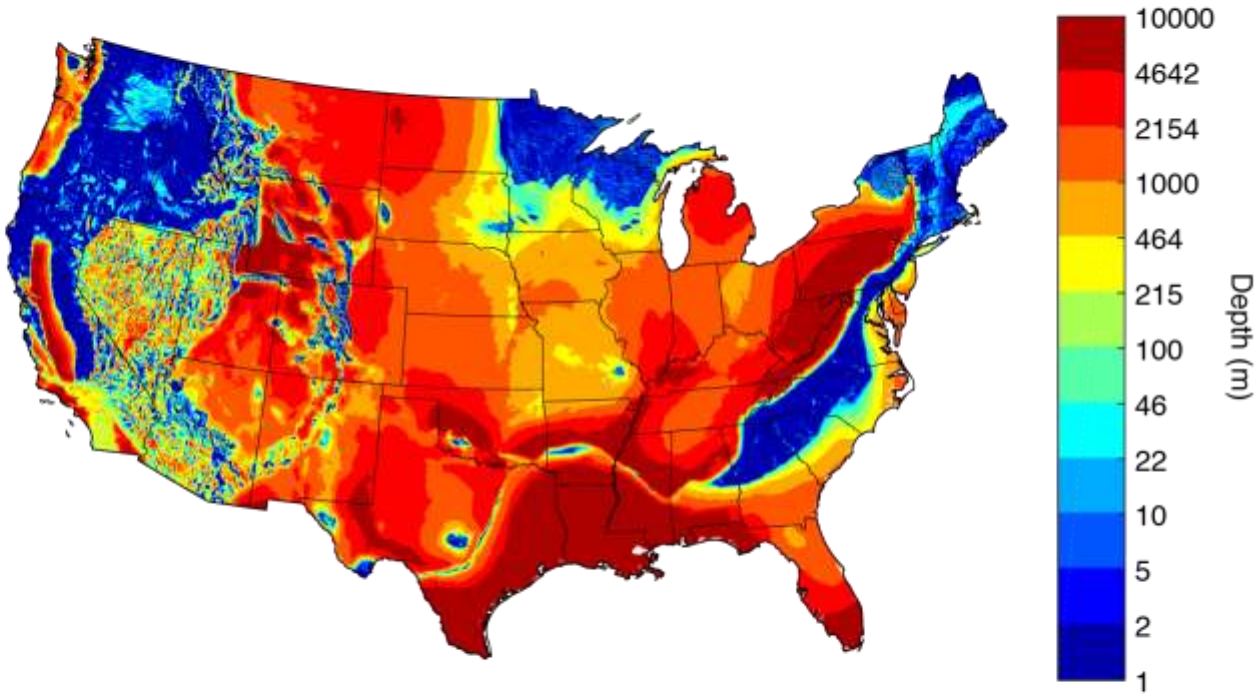


Presented by Oliver Boyd
U.S. Geological Survey

U.S. Department of the Interior
U.S. Geological Survey

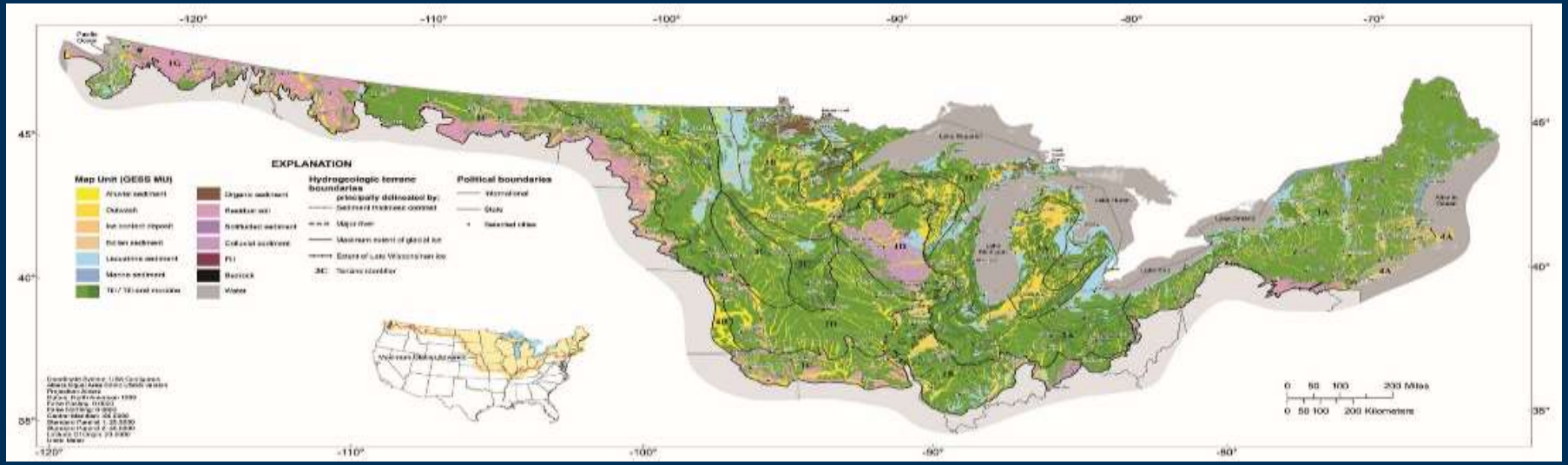
e.g. Basement Depth

- Depth to basement based on improvements to Mooney and Kaban (2010). Improvements include, for example, gravity-based surveys in the western United States and Depth to Precambrian basement in the CEUS from Marshak et al. (2017).



Variable definition of basement.

Maps of properties of Quaternary sediments and aquifers in the glaciated conterminous United States



U.S. Geological Survey: David R. Soller, Adel E. Haj, Richard M. Yager, Leon J. Kauffman, and James E. Reddy

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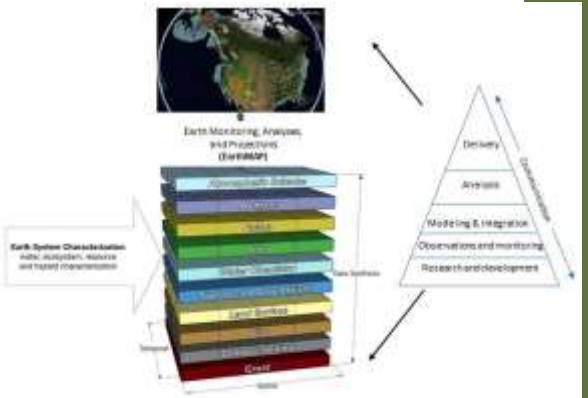
Grand Challenges for Integrated U.S. Geological Survey Science—A Workshop Report

By Karen E. Jenni, Martin B. Goldhaber, Julio L. Betancourt, Jill S. Baron, R. Sky Bristol, Mary Cantrill, Paul E. Exter, Michael J. Focazio, John W. Haines, Lauren E. Hay, Leslie Hsu, Victor F. Labson, Kevin D. Lafferty, Kristin A. Ludwig, Paul C. Milly, Toni Lyn Morelli, Suzette A. Morman, Nedal Talal Nassar, Timothy R. Newman, Andrea C. Ostroff, Jordan S. Read, Sasha C. Reed, Carl D. Shapiro, Richard A. Smith, Ward E. Sanford, Terry L. Sohl, Edward G. Stets, Adam J. Terando, Donald E. Tillitt, Michael A. Tischler, Patricia L. Toccalino, David J. Wald, Mark P. Waldrop, Anne Wein, Jake F. Weltzin, and Christian E. Zimmerman

Open-File Report 2017–1076

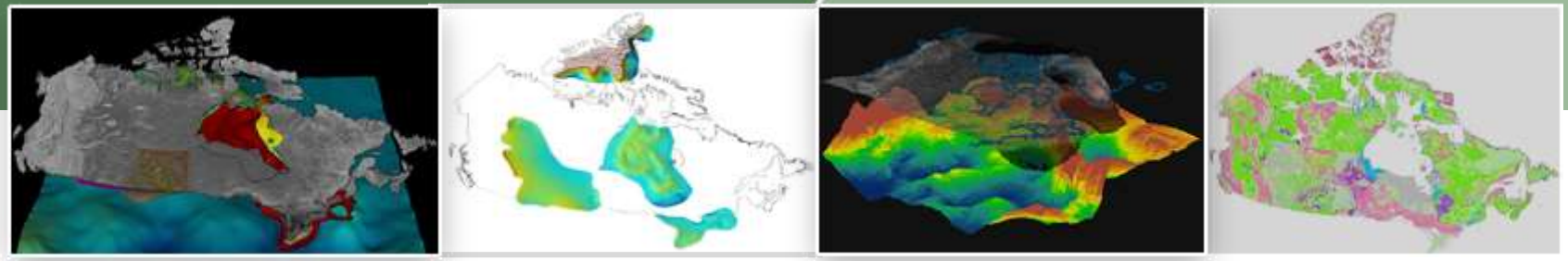


U.S. Department of the Interior
U.S. Geological Survey

a “comprehensive science challenge” that highlights the development of integrative science, data, models, and tools—all interacting in a modular framework—that can be used to address these and other future grand challenges:

- **Earth Monitoring, Analyses, and Projections (EarthMAP)**

EarthMAP is a long-term vision for an integrated scientific framework that spans traditional scientific boundaries and disciplines, and integrates the full portfolio of USGS science: research, monitoring, assessment, analysis, and information delivery



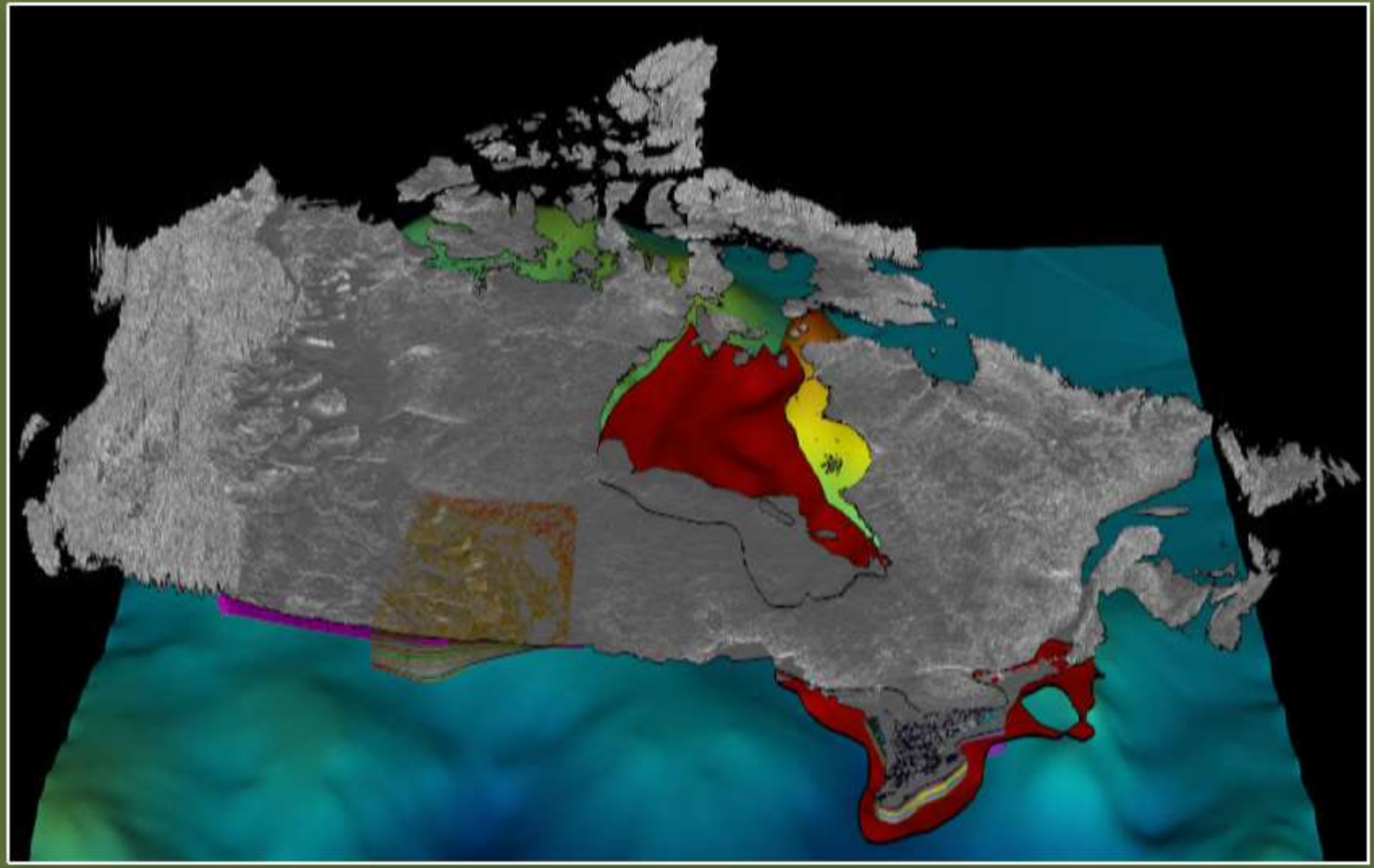
Canada-3D (C3D): Toward national surface and subsurface compilations of the geology of Canada

Hazen Russell,

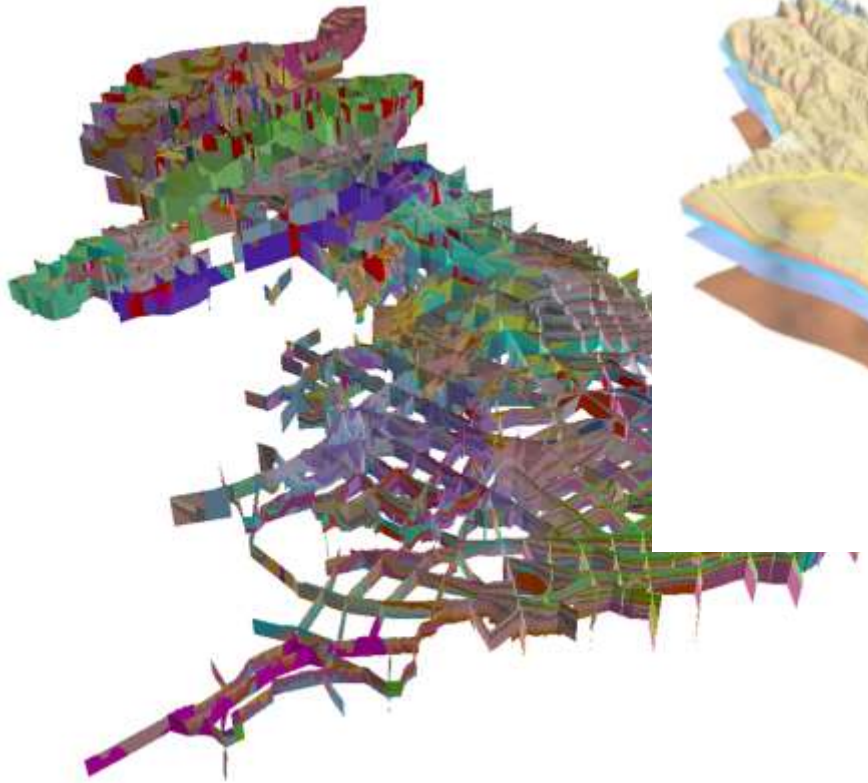
Boyan Brodaric, David Snyder, Marc St-Onge

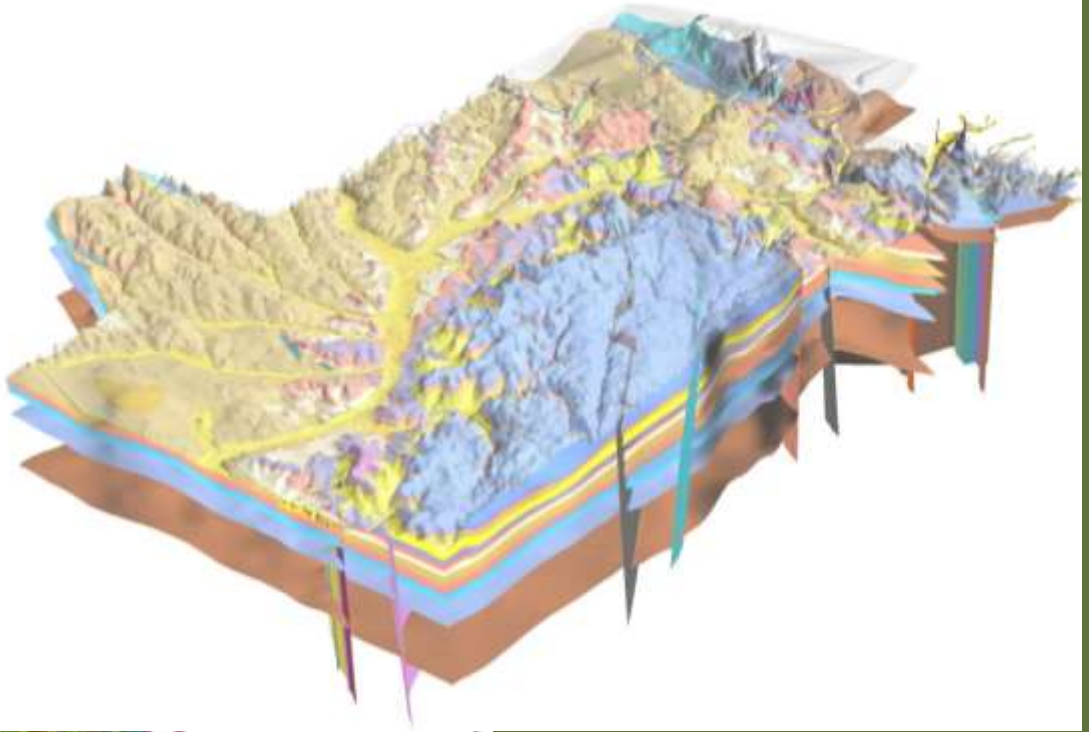
Geological Survey of Canada

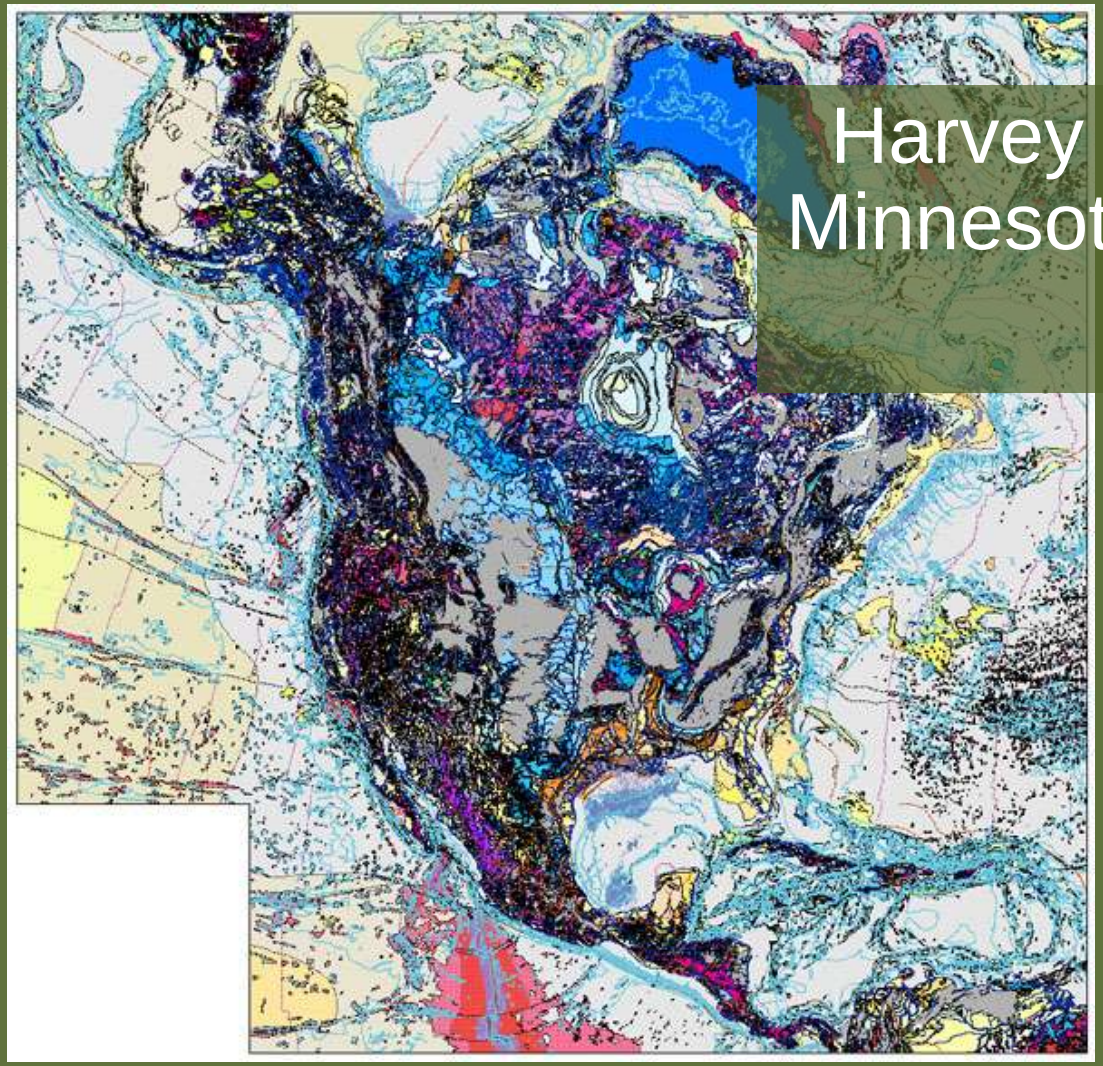
Ressources naturelles Canada | Natural Resources Canada | NGSC | Canada 3D | Canada



Staatsblad
van het Koninkrijk der Nederlan







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NGAC April 3 2018

National 3D Geology – a rapidly emerging concept