International coordination of 3D geological mapping

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National Geospatial Advisory Committee
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The first subsurface layer is bathymetry.
Next, soil mapping by agricultural agencies
Then, geology
Geological mapping, like all of the mapping we do, is an essential service

Energy
Minerals
Water
Hazards
Environment
Waste
Engineering
Geological mapping, like all of the mapping we do, saves money

- lives saved
- resources discovered
- costs avoided
- increased efficiency
- fundamental understanding
We need to accelerate in response to societal needs

Content
Collaboration
Administration
Infrastructure
Formats
Accessibility
Paper maps and their digital equivalents will continue to be our foundation.

Information content is rich, standards well-developed, formats are familiar, usable indefinitely, authorship, peer review.
Ongoing geological mapping will be supported by new drilling, geochronology, geochemistry, geophysics, & data compilation.
All geological mapping will be vertically georeferenced using the best available topography, bathymetry, drillhole data, & geophysical surveys.
Future geological mapping needs to be regularly updated, zoomable, queryable, complete, seamless, 3D, onshore to offshore.
3D starts with stacking, then thickness
Resolution

Global

Continental

Regional

Local
Appendix. Geochemistry of the <63 micron fraction

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<tr>
<th>Field</th>
<th>Lab</th>
<th>Ag ppm</th>
<th>Al %</th>
<th>As ppm</th>
<th>Au ppb</th>
<th>Ba ppm</th>
<th>Be ppm</th>
<th>Bi ppm</th>
<th>Ca %</th>
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Accessible
Future geological mapping needs to be well-coordinated.
The National Cooperative Geologic Mapping Program (NCGMP) is the primary source of funds for the production of geologic maps in the United States and provides accurate geologic maps and three-dimensional framework models that help to sustain and improve the quality of life and economic vitality of the Nation and to mitigate natural hazards.

The NCGMP represents over 2 decades of successful cooperation among Federal (FEDMAP), State (STATEMAP), and university (EDMAP) partners to deliver digital geologic maps to customers. Each of these three components has a unique role, yet all work cooperatively to select and map high-priority areas for new geologic maps.

Geologic mapping data from all of North America are presented via the National Geologic Map Database, and a common set of geologic map standards is being developed by the NCGMP in cooperation with the North American Geologic Map Data Model Steering Committee.

The USGS National Cooperative Geologic Mapping Program is Congressionally mandated by the National Geologic Mapping Act of 2010.
National Cooperative Geologic Mapping Program (NCGMP)


Planning and inception of the program was a joint effort of the USGS and the Association of American State Geologists (AASG)

The Program includes:

- FEDMAP - Funds Federal geologic mapping projects.
- STATEMAP - A matching-funds grant program with State geological surveys
- EDMAP - A matching-funds grant program for training new mappers

2014 Actual & 2015 Enacted - $24,397M
Geological mapping in the world is coordinated by the Commission for the Geological Map of the World (CGMW)
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The CGMW is an international non-profit association governed by French law and is responsible for designing, coordinating, preparing and publishing small-scale thematic Earth Science maps of the globe, continent, major regions and oceans.

The CGMW is affiliated to the International Union of Geological Sciences (IUGS) and the International Union of Geodesy and Geophysics (IUGG), and is supported by UNESCO.
Geological mapping accessibility is coordinated by OneGeology
OneGeology is an international initiative of the geological surveys of the world.

The Objectives of OneGeology are:
To be the provider of geoscience data globally;
To ensure an exchange know-how and skills so all can participate;
Use of the global profile of OneGeology to increase awareness of the geosciences and their relevance.

OneGeology mission:
'Make web-accessible the best available geological map and other geoscience data worldwide at the best possible scales, starting with at least 1:1 million scale.'
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