GeoPRISMS Data Management

Andrew Goodwillie and the IEDA Team @LDEO

http://www.iedadata.org
GeoPRISM Data Catalog

Marine Geoscience Data Library

Metadata Catalog and Geophysical/Geological Data Repository

MARGINS Data Collection, Academic Seismic Portal

EarthChem Library

SESAR

External Data Repositories e.g. IRIS, UNAVCO

GeoMapApp

Global Multi-Resolution Topography Synthesis

EarthChem DB

Data Visualization

Data Syntheses
Benefits of Accessible Community Data Resources

• Support scientific reproducibility
• Enable data re-use including for unanticipated purposes
• Aggregate collections enable new science
Preservation of Unique Observations

- Expensive facilities & instrumentation
- Remote locations
- Non-repeatable events
Support Scientist Responsibilities

• NSF funding requirements
• Journal requirements for data access
• Professional Societies (AGU) promoting FAIR data principles *

IEDA services support GeoPRISMS research in other ways

• GP Catalog: Data preservation serves NSF funding and Journal requirements, GP program legacy
• GP Catalog: Open Access for Community Experiments
• GP Catalog, Syntheses, GeoMapApp: Supports data use by a multi-disciplinary community, resources for GP synthesis efforts

GeoPRISMS: Open Access Seismic Experiments at Cascadia and ENAM
GeoPRISMS Data Portal

Information and data hosted includes:

- **Active source seismic surveys and other geophysical and geological data** (e.g. magnetotelluric data from Okmok volcano; ambient noise tomographic data from Cascadia; rock friction experimental data; East African Rift geodetic velocity solutions and magnetic field data).

- Large collection of **legacy/other program geophysical and bathymetry data** for each of GeoPRISMS Primary Site.

- **Geochemical data** from some GP programs at Cascades and Aleutian arc volcanoes, and legacy geochemical data for all primary sites.

- **GeoPRISMS bibliographic database**: Links GeoPRISMS-funded research papers to data sets and field program information.
<table>
<thead>
<tr>
<th>FY</th>
<th>Principal Investigator</th>
<th>Award Number</th>
<th>Project Title</th>
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<tbody>
<tr>
<td>FY13</td>
<td>T. Lopez</td>
<td>1250148</td>
<td>Geochemical constraints on the source, flux, migration, and seismic signature</td>
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<td></td>
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<td>of volcanic fluids, Katmai Volcanic Cluster, Alaska</td>
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<td>FY13</td>
<td>R. Harris</td>
<td>1249552</td>
<td>Thermal structure of the Cascadia subduction zone, Grays Canyon Discovery</td>
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<td></td>
<td></td>
<td></td>
<td>Corridor, Washington</td>
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<tr>
<td>FY12</td>
<td>Y. Shen</td>
<td>1144771</td>
<td>Developing a comprehensive model of subduction and continental accretion at</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Cascadia</td>
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<tr>
<td>Authors, Year</td>
<td>Title</td>
<td>Related Data Sets</td>
<td>DOI</td>
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<tr>
<td>Salmi et al., 2017</td>
<td>Thermal Environment of the Southern Washington region of the Cascadia Subduction Zone</td>
<td>Related Data Sets</td>
<td><a href="10.1038/ngeo2586">10.1038/ngeo2586</a></td>
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<td>Schauen et al., 2016</td>
<td>Evolution of the Delarof Islands, Aleutian Arc</td>
<td>Related Data Sets</td>
<td><a href="10.1785/0220160112">10.1785/0220160112</a></td>
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<tr>
<td>Shillington et al., 2015</td>
<td>Link between plate fabric, hydration and subduction zone seismicity in Alaska</td>
<td>Related Data Sets</td>
<td><a href="10.1038/ngeo2586">10.1038/ngeo2586</a></td>
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<tr>
<td>Shillington et al., 2016</td>
<td>Acquisition of a Unique Onshore/Offshore Geophysical and Geochemical Dataset in the Northern Malawi (Nyasa) Rift</td>
<td>Related Data Sets</td>
<td><a href="10.1785/0220160112">10.1785/0220160112</a></td>
</tr>
<tr>
<td>Spotila et al., 2015</td>
<td>Potential for Geologic Records of Coseismic Uplift and Megathrust Rupture along the Nicoya Peninsula, Costa Rica</td>
<td>Related Data Sets</td>
<td><a href="10.2112/JCOASTRES-D-14-00151.1">10.2112/JCOASTRES-D-14-00151.1</a></td>
</tr>
<tr>
<td>Straub and Esposito, 2013</td>
<td>Influence of water and sediment supply on the stratigraphic record of alluvial fans and deltas: Process controls on stratigraphic completeness</td>
<td>Related Data Sets</td>
<td><a href="10.1002/JGRF.20061">10.1002/JGRF.20061</a></td>
</tr>
<tr>
<td>Werner et al., 2017</td>
<td>Magmatic degassing, lava dome extrusion, and explosions from Mount Cleveland volcano, Alaska, 2011-2015: Insight into the continuous nature of volcanic activity over multi-year timescales</td>
<td>Related Data Sets</td>
<td><a href="10.1016/j.jvolgeores.2017.03.001">10.1016/j.jvolgeores.2017.03.001</a></td>
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79 GeoPRISMS papers: 25 (32%) linked to data
The GeoPRISMS data collection is maintained as the primary data resource supporting the NSF science program of focused investigations into Subduction Cycles and Deformation (SCD) and the processes of arc-continent collision and subduction. The data collection includes interdisciplinary data acquired during land and marine projects for expeditions including bathymetry, sidescan sonar, seismic reflection data, gravity, magnetics, CTD, ADCP, and sound velocity data, along with rock, fluid, and sediment sampling information. This diverse suite of derived data such as stacked receiver functions, seismic tomography models and models, among others. In addition to the references associated with this Collection, a comprehensive Database that includes references from both GeoPRISMS-funded and GeoPRISMS-related projects.
Access – GeoMapApp

• Support multi-disciplinary community access
• Access to relevant legacy and GP Program data sets

Perspective view across the ENAM Hatteras Outer Ridge

Aleutians legacy data: Processed multi-channel seismic profiles
GeoPRISMS Data: Cascadia – Geophysics

(1) Earthquake microseismicity catalogues from CI array – Morton, Bilek, Rowe

(2) Heat flow, CTD data – Johnson, Solomon, Harris, Salmi (AT26-04)

(3) Multi-channel Seismic/OBS data – COAST (Holbrook et al), MGL1211 (Carbotte/Canales), RR1718 (Tominaga et al)
OBS-derived Seismic receiver functions – Janiszewski, Gaherty, Abers

CHIRP sub-bottom profiler data – TN265 (Romsos, Goldfinger)
GeoPRISMS Data: Cascadia – Geophysics

Ambient wave seismic tomography – Gao and Chen
GeoPRISMS Data: ENAM – Geophysics

Hydro-acoustic data (MGL1510) – Crone et al.

Sub-bottom profiler data (MGL1514) – Key, Evans

Multi-Channel Seismic reflection shot data, seismic navigation, ship nav:
- MGL1405/MGL1510 New Jersey margin survey – Mountain et al.
- ENAM Community Seismic Experiment (MGL1408, Shillington et al.)
- Links to IRIS for OBS/onshore
GeoPRISMS Data: EARS – Geophysics

SEGMeNT Lake Malawi multi-channel seismic data – Shillington et al., 2015 survey.

Geodetic velocities – King, Floyd, et al.

Total Magnetic Intensity (TMI) grids for Malawi, Botswana (Atekwana et al.)

Electrical Resistivity Tomography (ERT) profiles for Malawi (Atekwana et al.)
GeoPRISMS Data: New Zealand – Geophysics

Multi-Channel Seismic reflection shot data, seismic navigation, ship nav:

**Hikurangi**
- SHIRE (MGL1708, Bangs et al.)
- NZ 3-D (MGL1801, Bangs et al.)
- STINGS (RR1508, Harris, Trehu, Fisher)
  + heat flow

**Puyssegur – MRC**
- SISIE (MGL1803, Gurnis et al.)

HOBITSS RR1509 u/w geophysics – Wallace et al.
GeoPRISMS Data: Alaska/Aleutians – Geophysics

Magneto-telluric (MT) data (Key, Bennington)

MGL1110 – Multi-Channel Seismic reflection shot and nav data, XCTD, XSV, multibeam data (Shillington et al.)

Links to IRIS
GeoPRISMS Data: Alaska/Aleutians – Geochemistry

Fluid chemistry – Taryn Lopez
Rock geochemistry – Kelemen et al.
Mt Cleveland volcanic trace gas chemistry – Werner, Roman, Plank
EarthChem database updated with high-priority Aleutian Arc data from > 60 publications

Helicopter flight path, colors show CO₂ concentration (red = high)
GeoPRISMS Data: Non-Focus Site Geochemistry, experimental

Multi-cycle carbon sediment chemistry (Alaska, NZ, Cascadia) – Blair, Childress
Fluvial system sediment tank experimental modelling – Straub
Rock physical properties experimental modelling – den Hartog
Geochronology data, Gulf of California – Kimbrough, Grove, Lonsdale
GeoPRISMS Data Catalog: Current status

Number of individual research awards so far: 118 (3 others for Office)

Number of expired awards: 62
Number of expired awards with data records (one or more) inventoried in GeoPRISMS Data Catalog: 32 (= 52%)

Number of active awards with data records in the GP Data Portal: 2

Number of expired awards with no Data Portal links to data:

~170 Data sets inventoried
MARGINS Legacy Data
MARGINS Legacy Data

MARGINS Legacy totals:
480 diverse data sets.  A few examples:

- Radiometric ages of Nicoya Peninsula sediments
- Hi-res sidescan sonar data of Waipaoa and Mariana arc
- Seismic reflection data for Central America, Gulf of CA, Nankai, IBM
- Rock sample geochemistry data
- X-radiograph data from Waipaoa sediment cores
- Hi-res bathymetry of Gulf of Papua, PNG
- Arabian plate geodetic velocities
- Heat flow offshore Costa Rica
- Water column optical backscatter data, PNG
GeoPRISMS Data Catalog

Goals: Link every research award to data
Build data resources to support GeoPRISMSs synthesis efforts.

We need your help to identify and locate missing GeoPRISMSs data sets and datasets needed for synthesis studies.

Contact us at: info@marine-geo.org