



*Geodynamic Processes
at Rifting and
Subducting
Margins*



Hikurangi, New Zealand workshop
Sunday December 14, 2014

What Is GeoPRISMS?

Successor to the decadal NSF MARGINS Program

Studies of origin & evolution of continental margins

Community-driven, interdisciplinary, cross-divisional NSF-funded
Integrating field, theory, experiment, and modeling

Focus on rifts and subduction zones

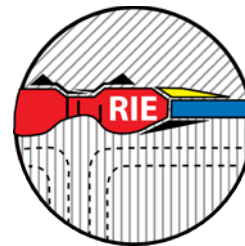
Active geodynamic processes; formation of continental crust
Where geology and society intersect; many economic resources

Shoreline-crossing, i.e., “amphibious”

Where most rifts and subduction zones occur
Geologic & geodynamic processes span the shoreline
Where focused, cross-divisional efforts most needed

Two broadly integrated initiatives

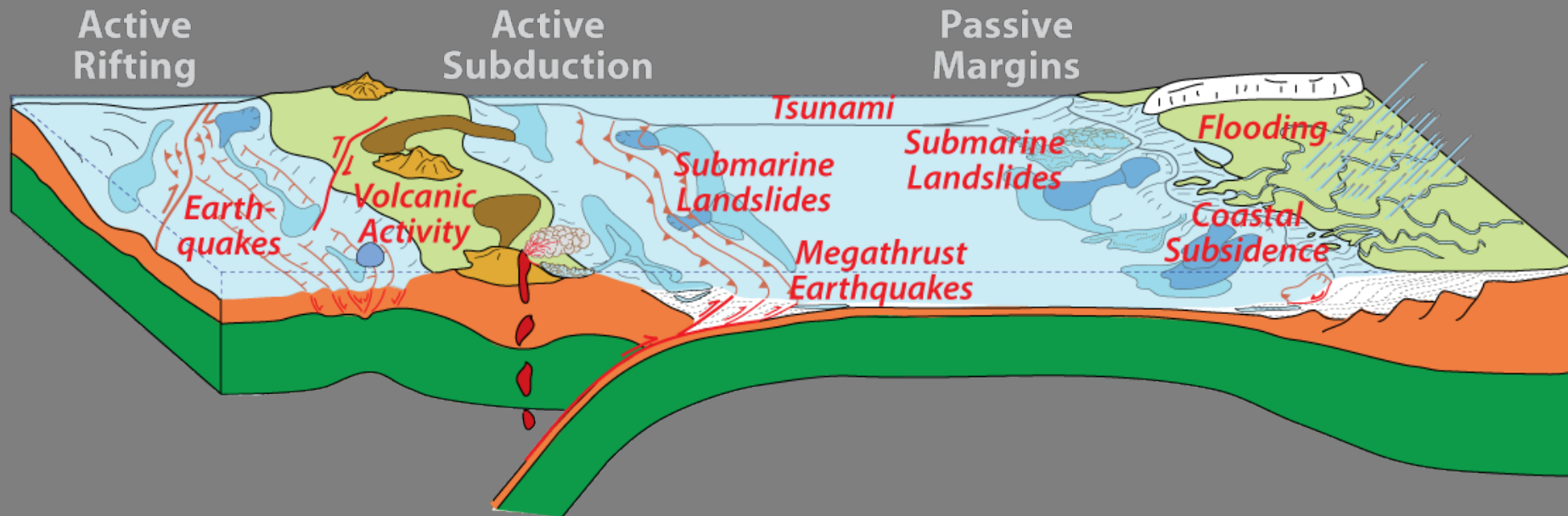
**Subduction
Cycles &
Deformation**



**Rift
Initiation &
Evolution**

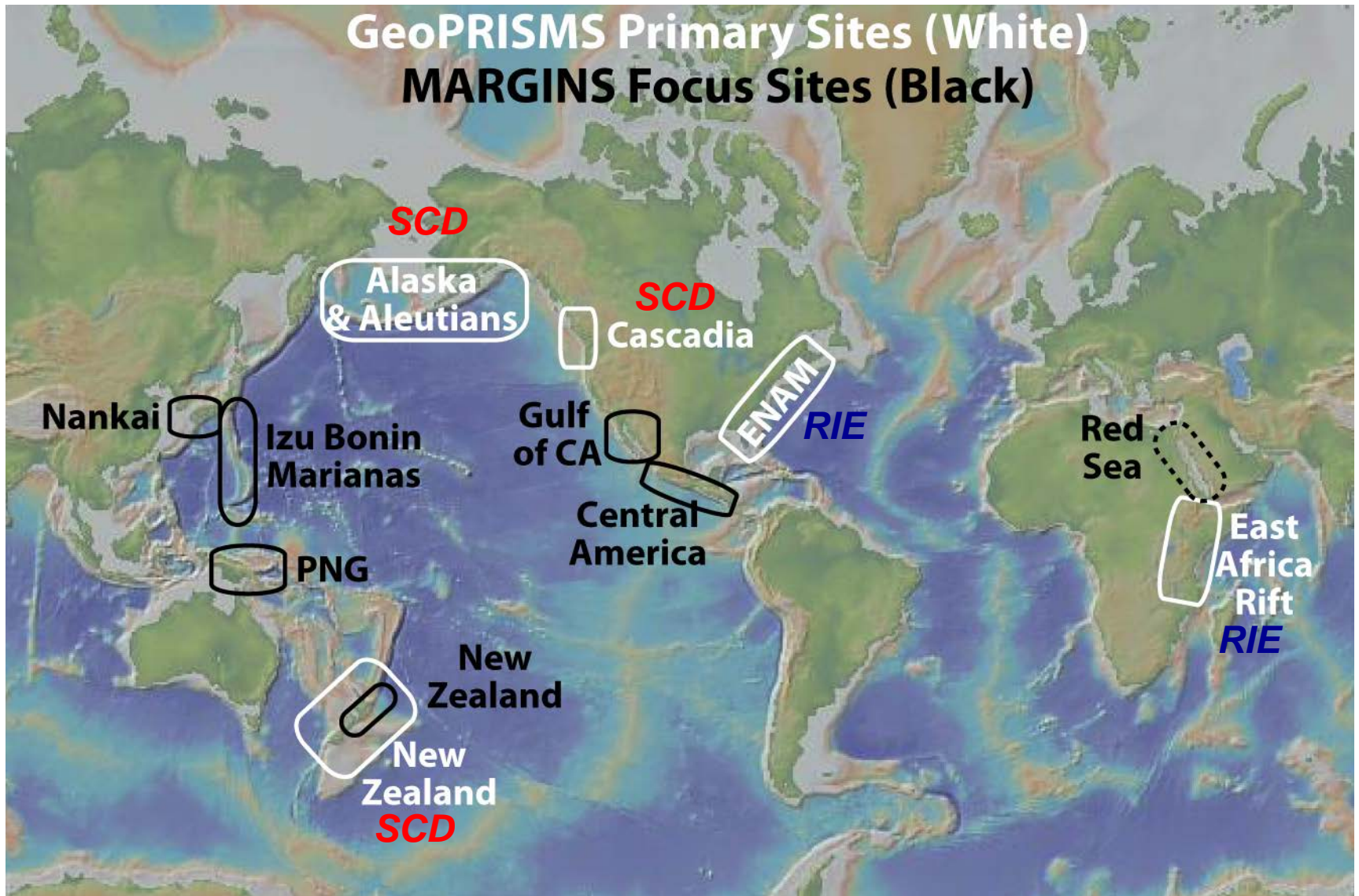
Research at Primary Sites & through Thematic Studies

GeoPRISMS Tectonic Settings

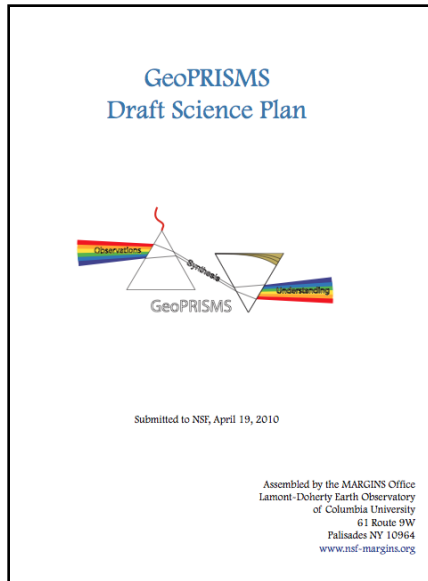


GeoPRISMS investigates the coupled geodynamics, earth surface processes, and climate interactions that build and modify continental margins over a wide range of timescales (from s to My), and cross the shoreline, with applications to margin evolution & dynamics, construction of stratigraphic architecture, accumulation of economic resources, and associated geologic hazards and environmental management.

Where GeoPRISMS Works



GeoPRISMS Community Science



Community planning at workshops

MSPW – Feb 2010

ENAM – Oct 2011

RIE IW – Nov 2010

Cascadia – Apr 2012

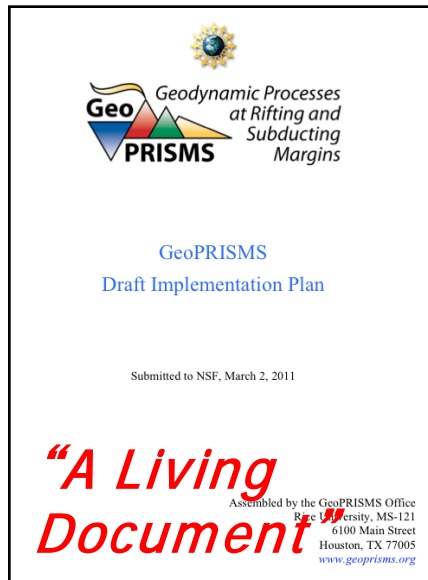
SCD IW – Jan 2011

EARS – Oct 2012

Alaska – Sep 2011

NZ – Apr 2013

Science Plans w/ research objectives



Proposals guided by Science Plan

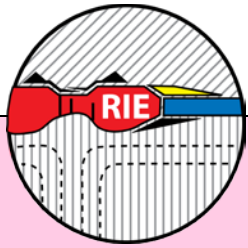
PI-driven proposals (individual, team, postdoc)

Community-driven proposals (e.g., Amph. Array)

Workshop proposals (planning, science, synth.)

Deadline early July

GeoPRISMS is open, all can participate!!



GeoPRISMS Structure & Topics

Rift Initiation and Evolution (RIE)

Where and why continental rifts initiate

Fundamental rifting processes; feedbacks in time & space

Controls on the architecture of rifted continental margins

Mechanisms & consequences of fluid & volatile exchange



Subduction Cycles and Deformation (SCD)

Controls on size, frequency & slip behavior of subduction plate boundaries

Spatial-temporal deformation patterns during seismic cycle

Linkages between volatiles & plate boundary rheology

Volatile storage, transfer, & release in subduction systems

Geochemical products of subduction; continent creation

Subduction zone initiation and arc system formation

Feedbacks between surface processes & subduction dynamics

Opportunities for Students & Postdocs

Education & Training

AGU Best Student Presentation prizes

Distinguished Lectureship Program

Postdoctoral fellowships

Student (and post-doc) symposia (at workshops)



Alaska



ENAM



Communication and Data Access

Communication

GeoPRISMS website

GeoPRISMS newsletter

GeoPRISMS listserv

Data Access

GeoPRISMS data portal

MARGINS data portal

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GeoPRISMS

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GeoPRISMS Newsletter

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Welcome to GeoPRISMS

Julia Morgan, GeoPRISMS Steering and Oversight Committee Chair
Rice University

I am excited to introduce the inaugural issue of the GeoPRISMS Newsletter (NSF) to the series that includes the MARGINS Newsletter. Over the last year, MARGINS successfully transitioned into GeoPRISMS, and the program itself is a moving unit. The GeoPRISMS Office, under the leadership of our new Office, opened at Rice University last October, as the last MARGINS Office closed its doors at Lamont-Doherty Earth Observatory.

The genesis of GeoPRISMS was unquestionably a community effort, but it would not have been possible without the able guidance of the previous MARGINS chair, Geoff Blum, and his staff. Geoff deserves extraordinary thanks for providing the MARGINS Program through its detailed review, guiding the community through planning the MARGINS workshop and office transition as the GeoPRISMS Office started up. New members, Karol Haxel, and Heather Goshaw, who staffed the MARGINS Office at Lamont, provided invaluable assistance, keeping the MARGINS Office open to ensure a gradual and graceful transition throughout the fall. Previous MARGINS Chairs, Julie Morgan, Gary Karner, and Brian Taylor also left their unique imprints on the MARGINS Program, and all are greatly responsible for its success and guiding the previous decade of groundbreaking scientific progress in our modern understanding of things that have happened very rapidly in the GeoPRISMS Office. See a special feature on our website.

There are still many challenges ahead of the office. Maria Chappaz-Sandoz is Administrative Coordinator, Charles Blum is Science Coordinator, and Alison Henning is Education and Outreach Coordinator (see page 14). The new GeoPRISMS website is up and running (http://www.geoprisms.org), and new content will be added by the day (see page 39). The office has held or is holding two community planning workshops, and delivered the GeoPRISMS Implementation Plan to NSF. We need, and hope to see very long, with the GeoPRISMS Townhall and Student Forum and the GeoPRISMS Student Plan. The Outstanding Leadership Program has just finished its 2010-2011 session, and new speakers have been identified for the year to come. And we are now preparing for several more planning workshops that will take place within the year (see Gary Karner, and Brian Taylor also left).

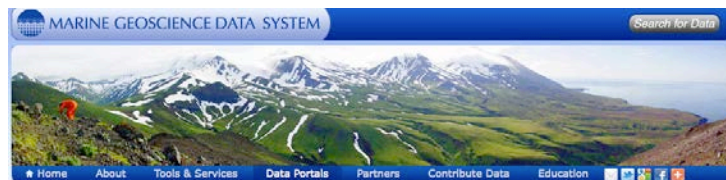
Upcoming Meetings

Apply Now!

Alaska Planning Workshop
Subduction Zones & Deformation: Prior & Site
September 22-24, 2011 • Portland, OR
Applicants due: June 2

EarthScope - GeoPRISMS Science Workshop for Eastern North America
Site to Site: B&S Deformation Prior & Site
October 27 - 29, 2011 • Virginia University
Applicants due: August 1

Apply online at <http://www.geoprisms.org>



GeoPRISMS Data Portal

Portal Links

- Portal Home
- Data Policy
- What's New
- Project Information
- Related Links
- MediaBank
- Tutorials
- GeoPRISMS References
- MARGINS References
- GeoMapApp
- Virtual Ocean
- Find Data



Continental margins are the Earth's principal loci for producing hydrocarbon and metal resources, for earthquake, landslide, volcanic and climatic hazards, and for the greatest population density. Despite the societal and economic importance of margins, many of the mechanical, fluid, chemical and biological processes that shape them are poorly understood. The GeoPRISMS Program, supported by the National Science Foundation and built upon the NSF MARGINS program, focuses upon the coordinated, interdisciplinary investigation of the continental margins through two initiatives: the Subduction Cycles and Deformation (SCD) and Rift Initiation and Evolution (RIE). In order to address the fundamental scientific questions, each initiative is associated with Primary Sites to address a wide range of field, experimental and theoretical studies spanning broad spatial and temporal scales.



MARGINS Data Portal

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More info: <http://www.geoprisms.org>

Current and upcoming meetings & events

AGU 2014

Sunday December 14: NZ miniworkshops

Monday December 15: GeoPRISMS Townhall

Westin Franciscan Ballroom 6-9 pm

Thursday December 18: Subduction Zone Observatory
discussion at City Club of San Francisco, Salon room
3:30-5 pm

Fall 2015

GeoPRISMS SCD Theoretical and Experimental Institute
SZO planning workshop

Fall 2016

GeoPRISMS RIE Theoretical and Experimental Institute

GeoPRISMS funding opportunities for 'big' projects in New Zealand open for July 2015 and July 2016 proposal deadlines

Four out of seven SCD questions can be answered in New Zealand

What are the geological, geochemical and geophysical responses to subduction initiation and early arc evolution, and how do they affect subduction zone development?

What are the pathways and sources of magmas and volatiles emerging in the arc and forearc, and how do these processes interact with upper plate extension?

What controls subduction thrust fault slip behavior and its spatial variability?

What are the feedbacks between climate, sedimentation, and forearc deformation?