Oceanic Detachment Faults

InterRidge Working Group

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	J. Pablo Canales	WHOI, USA
Group Members:	Gretchen Früh-Green	ETH, Switzerland
	Nick Hayman	U. Texas, USA
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	Andrew McCaig	U. Leeds, UK
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	Timothy Reston	U. Birmingham, UK
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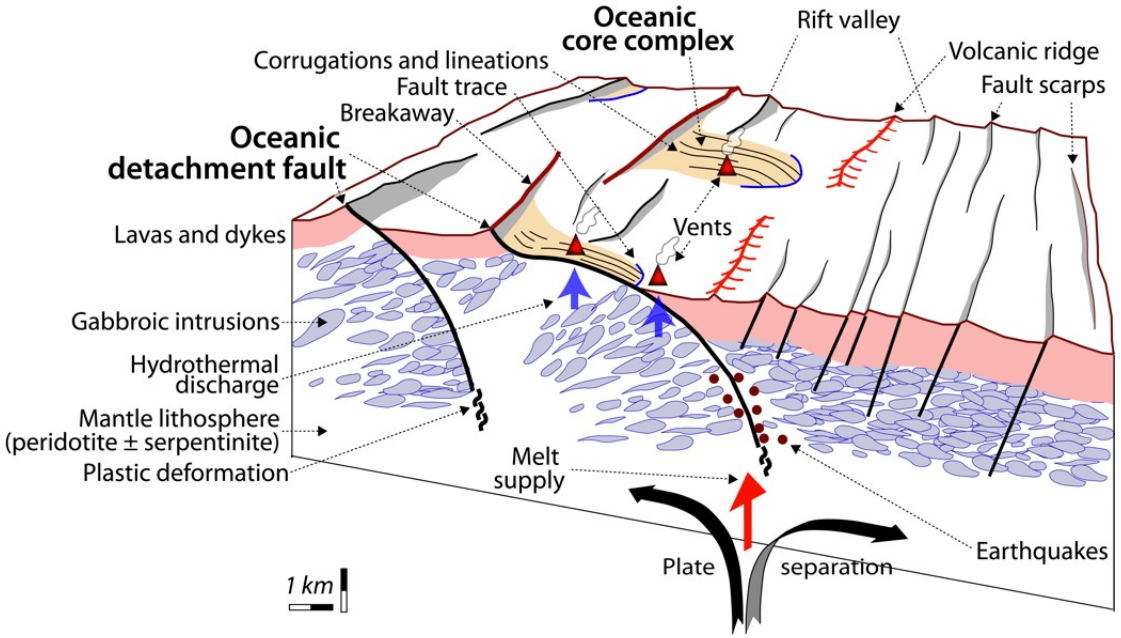
Background

Oceanic core complexes (OCCs) are deep sections of the oceanic lithosphere exhumed to the seafloor by long-lived **oceanic detachment faults** (ODFs) formed along the flanks of ultra-slow to intermediate-spreading mid-ocean ridges.

Chapman Model



Escartín, J., and J. P. Canales (2011), Detachments in Oceanic lithosphere: Deformation, Magmatism, Fluid Flow and Ecosystems. *Eos Trans. AGU*, *92*(4), 31.

Background

ODFs and OCCs have increasingly attracted the interest of a diversity of bio- and geoscientists because they represent or provide access to:

1) Tectonic windows providing access to deep-seated rocks and processes such as mantle flow, melt generation and migration, strain localization, and crustal accretion at mid-ocean ridges;
2) A fundamental process that may be responsible for >50% of lithospheric accretion along slow and ultra-slow spreading centers;
3) A unique setting for sustaining both long-lived, high-temperature hydrothermal circulation as well as low-temperature, hydrogen-rich, serpentinite-related hydrothermal systems, and their associated mineral deposits and micro- and macro-biota;
4) A fault zone, containing weak hydrous alteration phases, that localizes strain over extended periods of time, with associated flexure and rotation of the footwall;
5) A key to understand continental metamorphic core complexes formed in settings of extreme tectonic extension, as well as to detachment faults associated with extensional magma-poor continental margins.

2011 Working Group Roles and Planned Activities

1. Foster and strengthen links to other efforts and programs towards the study of oceanic detachment faults (e.g., GeoPRISMS, IODP, other IR WGs, etc.)

2. Advance in the understanding of these structures through the planning of sessions at international meetings (EGU, AGU), and convening of a topic Workshop in the future.

3. Through e-mailing/web site share information regarding on-going projects, planned cruises, and facilitate exchanges and cooperation among scientists.

4. Playing a coordinating role for specific sites and projects if requested by the scientific community.

5. Promote further contributions to the G-cubed Theme, which we expect will become a reference and key compilation of research results in the topic.

2013 Working Group Activities

1. Foster and strengthen links to other efforts and programs towards the study of oceanic detachment faults (e.g., GeoPRISMS, IODP, other IR WGs, etc.)

2. **Advance in the understanding of these structures through the planning of sessions at international meetings (EGU, AGU), and convening of a topic Workshop in the future.**

3. Through e-mailing/web site share information regarding on-going projects, planned cruises, and facilitate exchanges and cooperation among scientists.

4. Playing a coordinating role for specific sites and projects if requested by the scientific community.

5. **Promote further contributions to the G-cubed Theme, which we expect will become a reference and key compilation of research results in the topic.**

2013 AGU Fall Meeting

T026: Oceanic Detachment Faulting and Associated Processes at Mid-Ocean Ridges

Conveners:
(1) J. Pablo Canales, Woods Hole Oceanographic Institution, USA
(2) Javier Escartín, CNRS/IPG Paris, France
(3) Andrew McCaig, University of Leeds, UK
(4) Nick Hayman, University of Texas, USA,

24 Abstracts Received

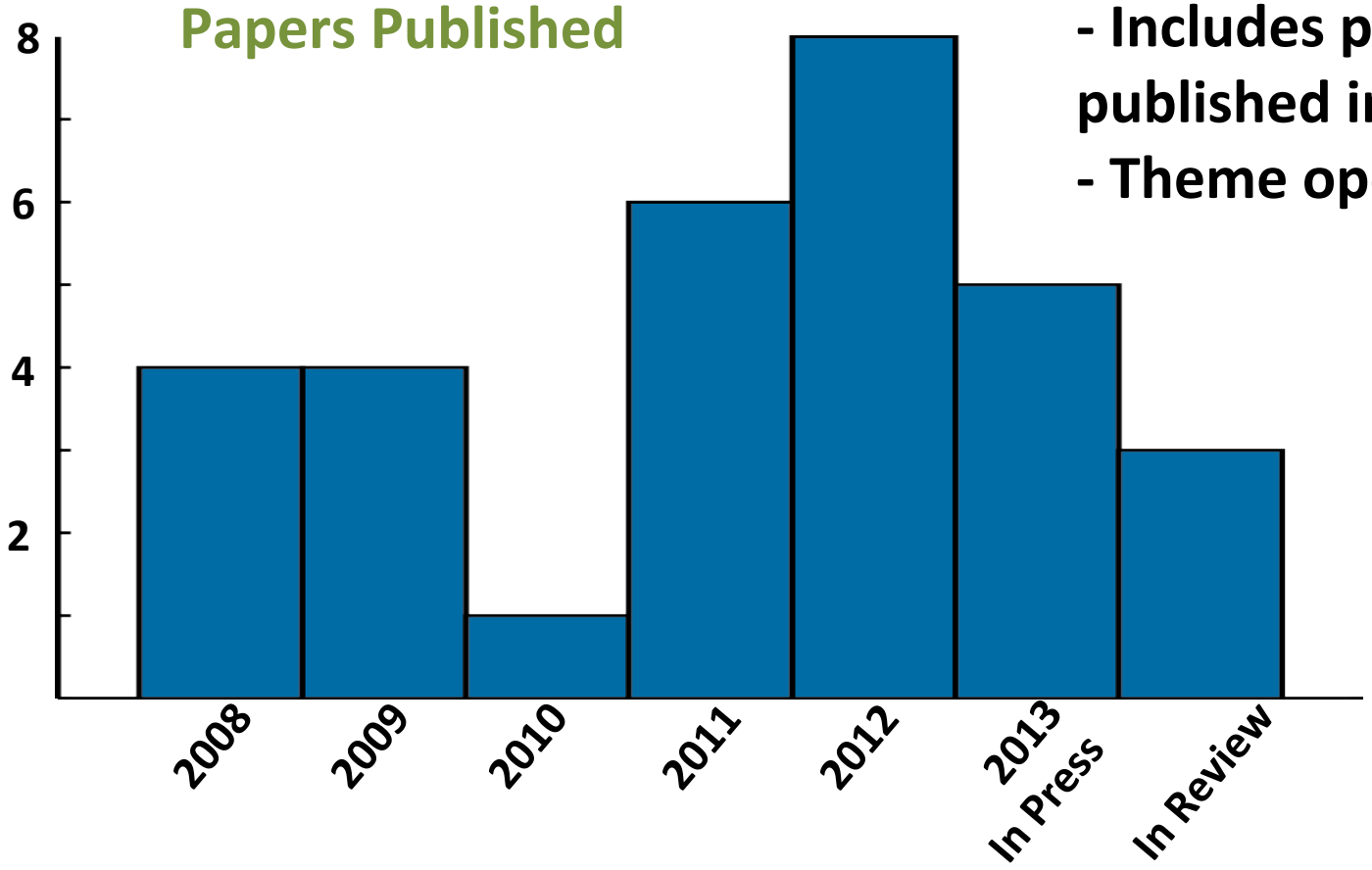
G-Cubed Theme:
"Oceanic Detachment Faults"

Guest Editors:

(1) J. Pablo Canales, Woods Hole Oceanographic Institution, USA
(2) Javier Escartín, CNRS/IPG Paris, France
(3) Gretchen Früh-Green,ETH, Switzerland
(4) Mike Cheadle, University of Wyoming, USA
(5) Barbara John, University of Wyoming, USA

G-Cubed Theme:
"Oceanic Detachment Faults"

- Started in 2011
- Includes papers published in 2008-2010
- Theme open until 2015



Future Planned Activities

- Organize a 2-3 day InterRidge Theoretical Institute on a specific topic related to oceanic detachment faulting (Spring or Fall 2014).
- Convene a session in the EGU meeting in Spring 2015.
- Encourage the younger generation of scientists to organize/convene a topical Conference (AGU Chapman or similar) in oceanic detachment faulting to wrap up the theme (2016?).