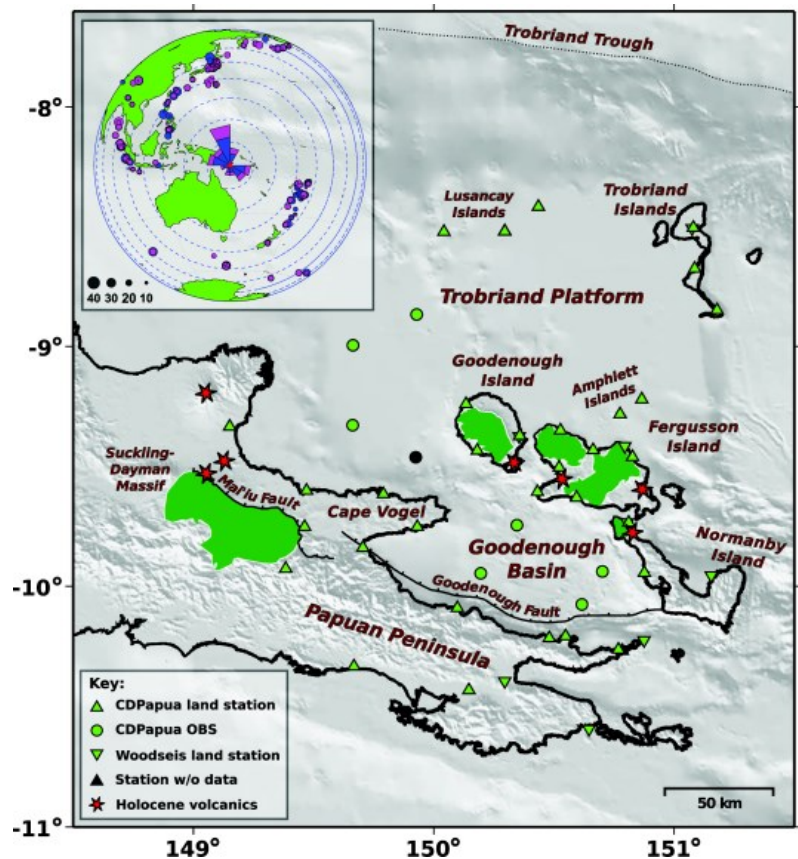


OBSIP Experiment Archive

Year:	2011
Experiment Name:	Papua New Guinea Woodlark Rift Imaging Experiment
Principal Investigator(s):	Suzanne Baldwin (Syracuse) Geoff Abers (LDEO) Jim Gaherty (LDEO)

Experiment Summary: (Taken from 2011 AGU Fall Meeting Abstract Abers et al.): Rifting and ocean-basin forming events are active only in a few places, although they represent the best accessible evidence for the early stages of continental breakup. One such place is the Woodlark Rift, Papua New Guinea, where a transition occurs along strike (with distance to the Euler pole) from limited continental extension, to large extension and formation of metamorphic core complexes, to full sea floor spreading. The exposures here provide access to both horizontal and vertical mass transport associated with rifting; the youngest ultra-high-pressure (UHP) rocks on the planet, 7-8 Ma coesite-eclogite, have been found within the metamorphic core complexes of the D'Entrecasteaux Islands [Baldwin et al., 2008]. These rocks have exhumed from c. 100 km depths at rates that must average 15 km/Ma, at least 50% of horizontal extension rates over this time period. This represents one of the few places where extension is clearly implicated in the exhumation of UHP rocks and perhaps one of the only places where UHP exhumation is still active. In order to understand how such exhumation could occur, we installed a 39-element broadband seismic array across the region of continental rifting of the D'Entrecasteaux Islands and Papuan Peninsula, including 8 ocean-bottom seismographs from the OBSIP broadband pool and 31 IRIS-PASSCAL broadband instruments on land.



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OBSIP Experiment Archive

...Continued

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Experiment Summary: ...These data, being recovered in mid-2011, will provide the only sampling of both seismicity and wave propagation through the region of UHP exhumation and core complex formation. They complement a more limited data set collected in 1999-2000 to the east along strike, where continental rifting transitions to seafloor spreading. The latter data showed substantial crustal thinning and removal of mantle lithosphere beneath the axis of core complexes, although the spatial patterns and extension onshore could not be well determined, and seismicity associated with core-complex faulting remained enigmatic. The new, much denser array should resolve questions regarding the seismic nature of structures bounding the core complexes, variations in crustal structure, and hopefully the upper-mantle structures upon which the UHP rocks are exhumed. The data are collected in the context of a much larger Continental Dynamics project featuring structural geology, geochronology, volcanology, neotectonics, geodesy, and numerous other studies seeking to understand the metamorphism and its exhumation.

Cruises:

1/24/2011 - 2/1/2011:

8 SIO broadband ocean bottom seismographs were deployed and recovered on board the M/V Marcus Rankin.

Data:

Data from all instruments deployed are archived under temporary network code [ZN](#) at the IRIS DMC.

Downloads/Links:

[G-Cubed Publication](#)