Canadian Perspective
GeoPRISMS New Zealand Primary Site
– Canadian Perspective

Kelin Wang
Geological Survey of Canada

- Slow slip events (and tremor)
- Megathrust coupling and great earthquakes
- Cabled seafloor observatories
Correlation of giant earthquakes with smooth incoming seafloor
GPS evidence for creeping subduction faults ("partial locking")

Lack of correlation with very rough incoming seafloor

2011 M 9.0

1952 M 9.0

1964 M 9.2

1700 M 9

2004 M 9.2

1960 M 9.5

sediment rich

sediment poor

extremely rough seafloor

giant earthquakes of $M \geq 9$

other $M \geq 8.2$ subduction events
840 km fibre-optic cable
6 nodes, over 100 instruments
Open, real-time data access
Power – 9 KW
Data – 5 GB bandwidth
Earthquake processes and tectonics

Scientific themes
Scientific themes

- Subsea geofluids
- Earthquakes and tectonics
- Deep sea ecosystems
- Marine life and climate change
- Engineering and information science
Haida Gwaii earthquake, Oct., 2012
Samoa tsunami, 2009

Thomson et al. 2011

Pressure gauges

NEPTUNE

October 2009

LaPush

Time (hours UTC)

109 km

ODP 1027-S BPR

NEPTUNE Canada Bottom Pressure Recorder and CORK installation, 10/2009. Installed recorders include locations indicated by white markers. Inset map details instruments connected to ODP 1027 node.
hydrate, gas

Methane concentration
Marine mammal

Broadband seismometer – Station NC27 – Channel HHZ

Fin whale calls

Earthquake T-phase

Counts

UTC Time on 12-Nov-2010
SeaJade: GSC, JAMSTEC, UVic, WHOI joint projec
Deployment 1, 2010; Deployment 2: 2013-2014
ACORK just seaward of Nankai trench (Davis et al., 2013)
Abridged cable routes at present