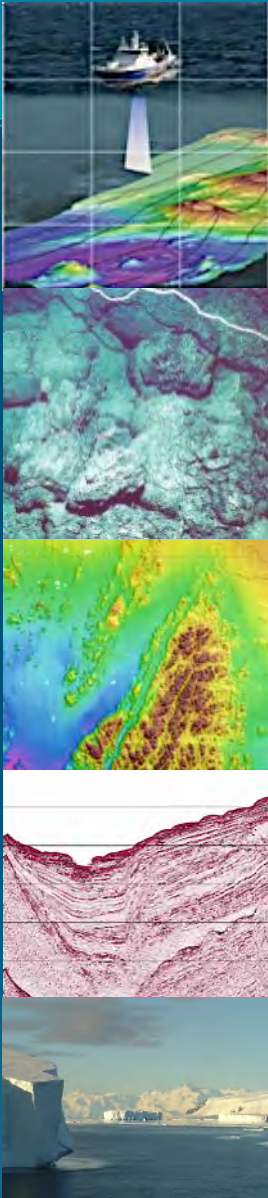


New Zealand marine geological and geophysical research capabilities and databases

Geoffroy Lamarche and Stuart Henrys

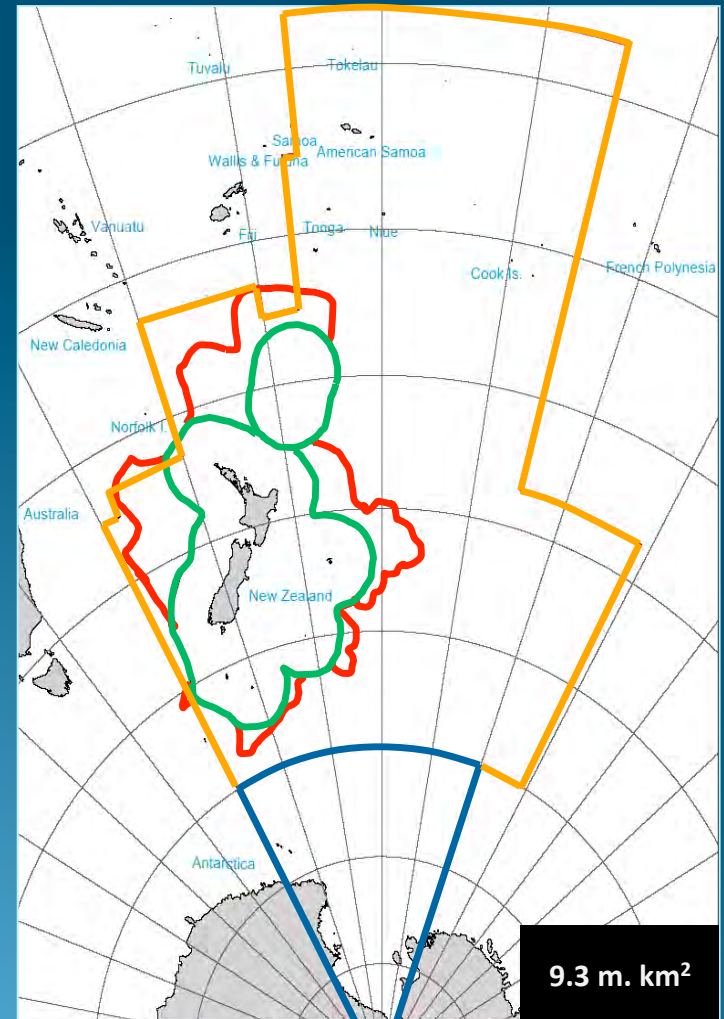
GeoPRISMS - Planning Workshop for the New Zealand Primary Site
April 15-17, 2013; Te Papa Museum, Wellington, New Zealand





Outline

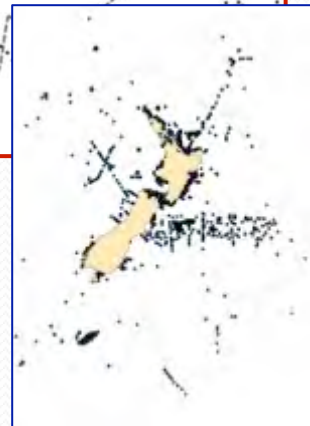
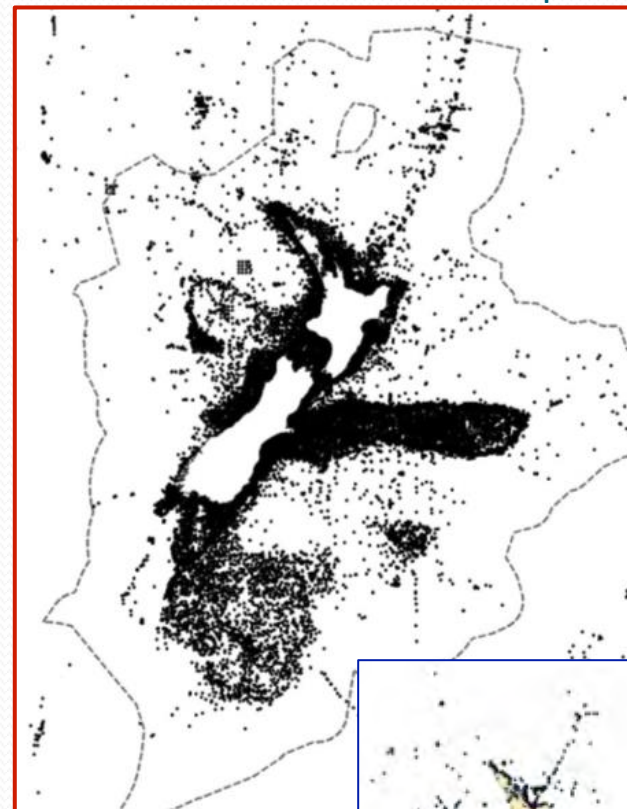
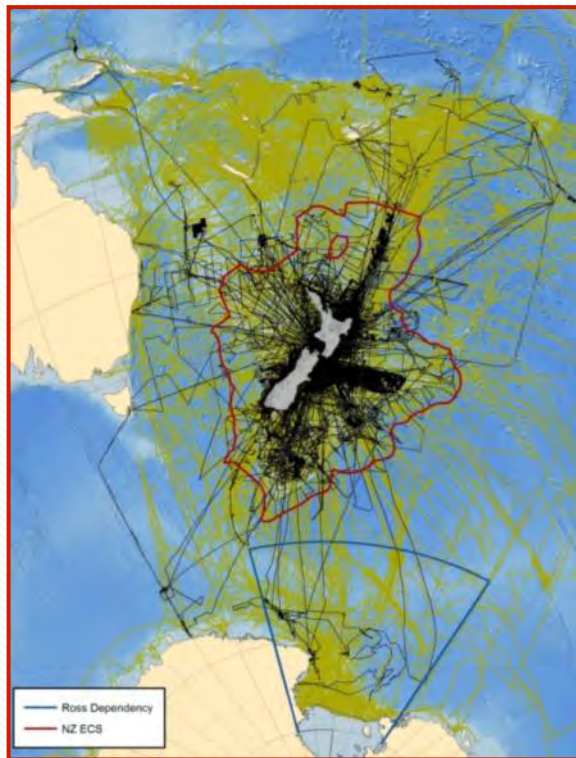
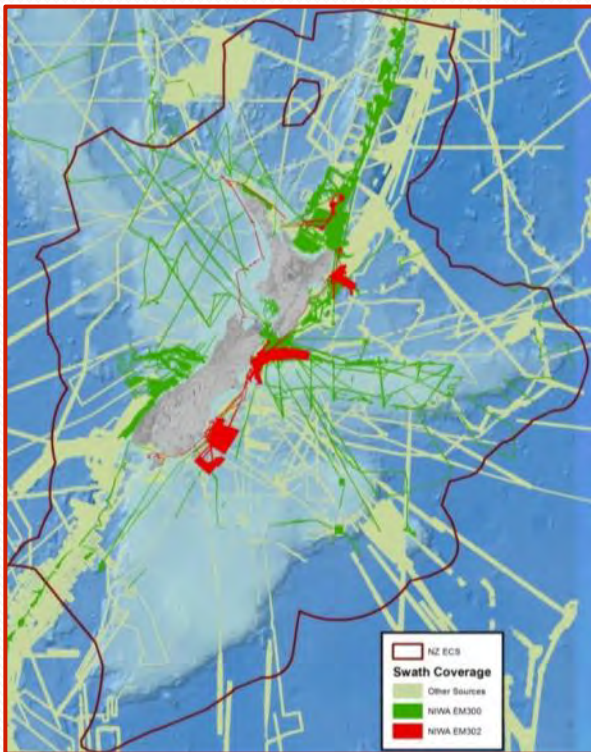
1. NZ Research Vessel
2. Marine Geophysical and Geological Databases
3. Other Marine expertise
4. ANZIC and IODP



Marine G&G

- Seafloor Bathymetry & Backscatter
- Samples stations
- Seismic
- Seafloor Photo and Videos

50 yrs legacy of NZ exploration



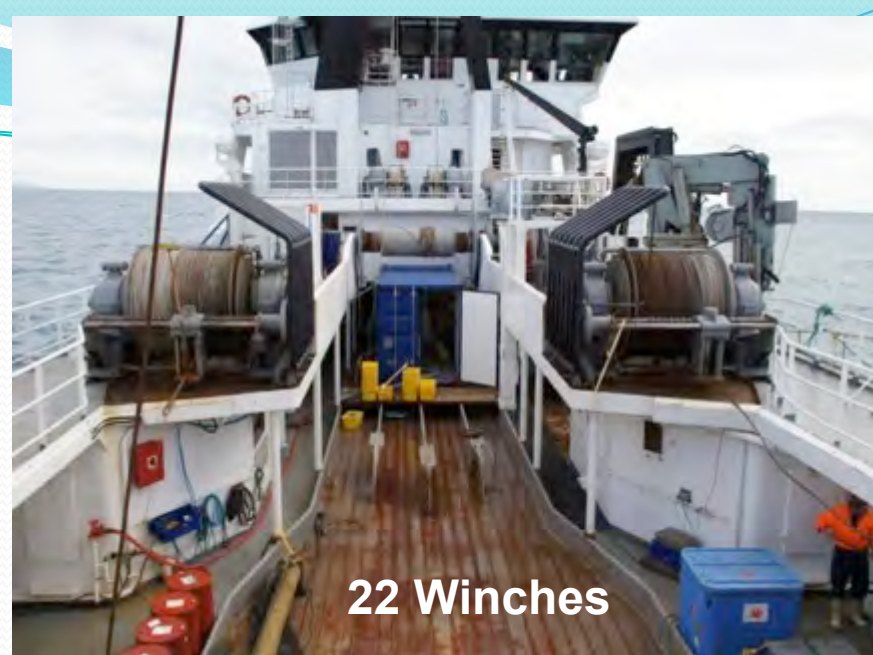
25% Surveyed
10% EM300 & EM302

NZ Research Vessel *Tangaroa*



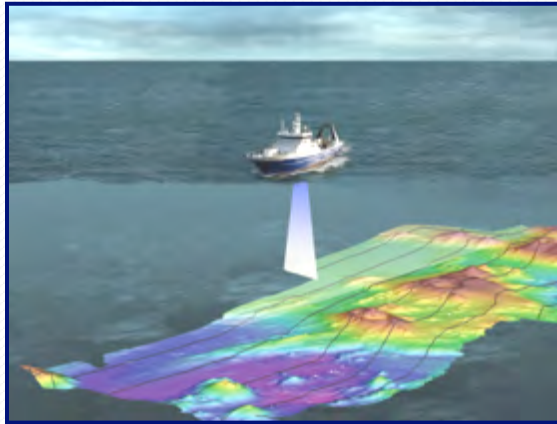
R.V. Tangaroa

- Length 70 m
- Beam 14 m
- Draft 7.4 m
- Gross Tonnage 2282t.
- 13 - 14 crew

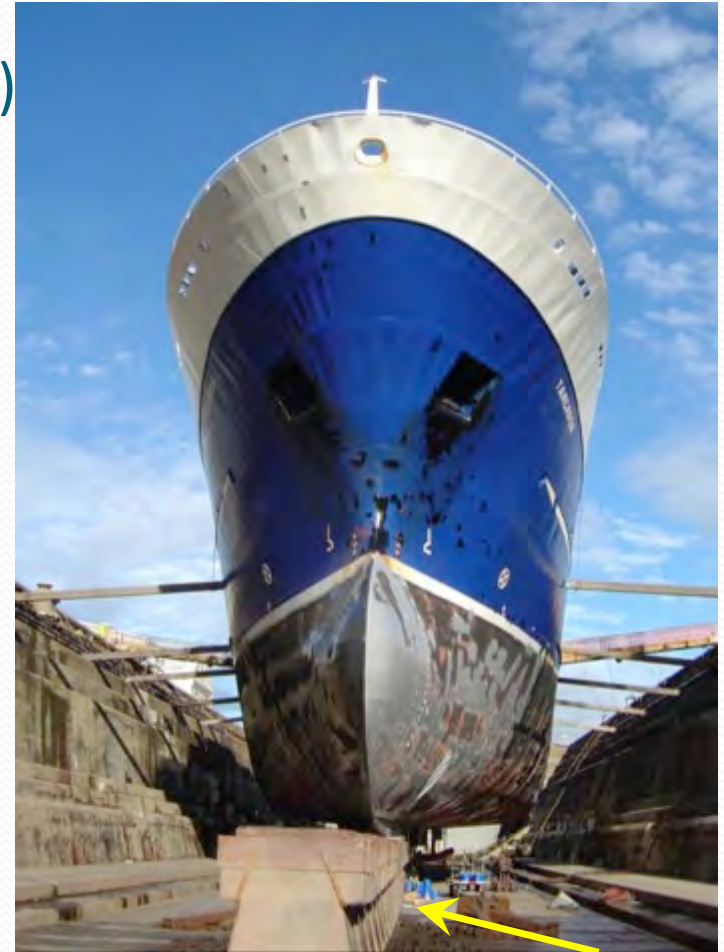


Echosounders

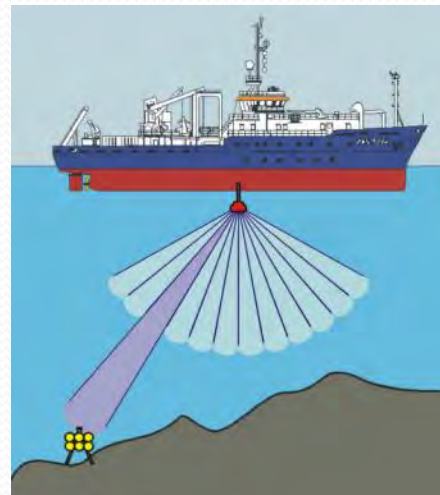
- EM302 (30 kHz)
- EM3002 (300 kHz)



DP2
Dynamic
Positioning
System

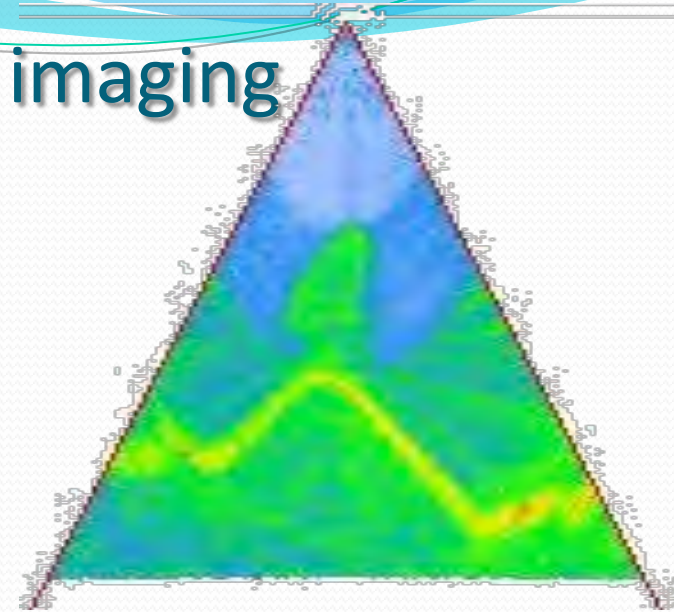
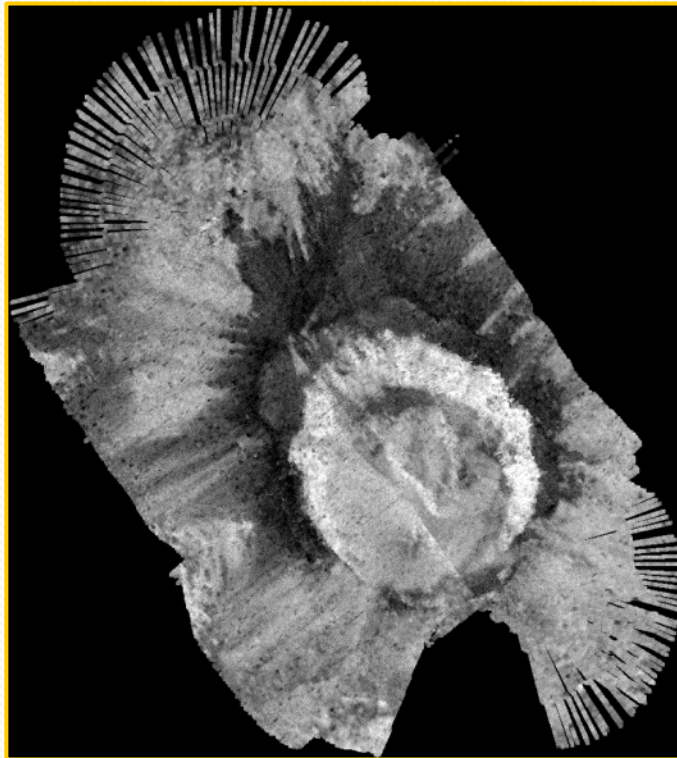
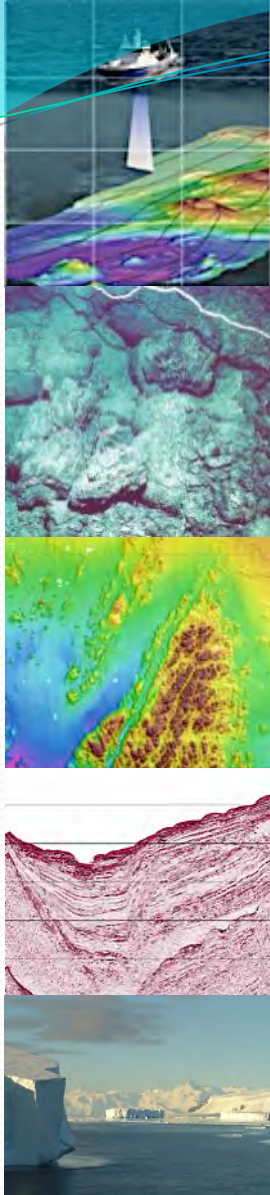


HIPAP
High Precision
Positioning
Acoustic System

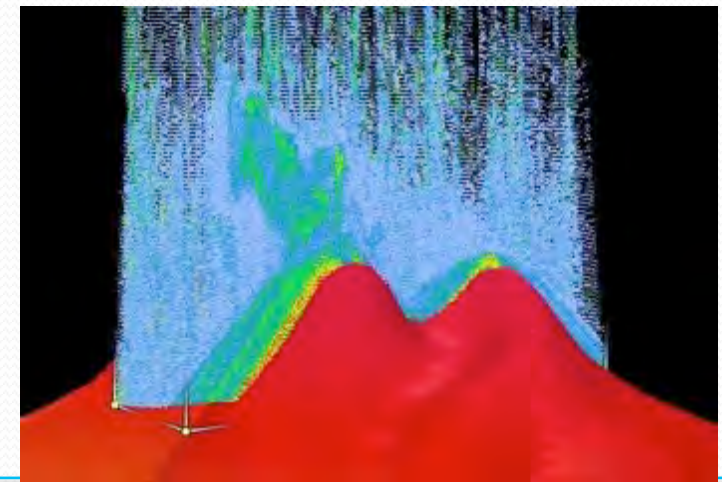


www.km.kongsberg.com/

EM302 Full water column imaging and Seafloor Backscatter



Volcanic Plumes



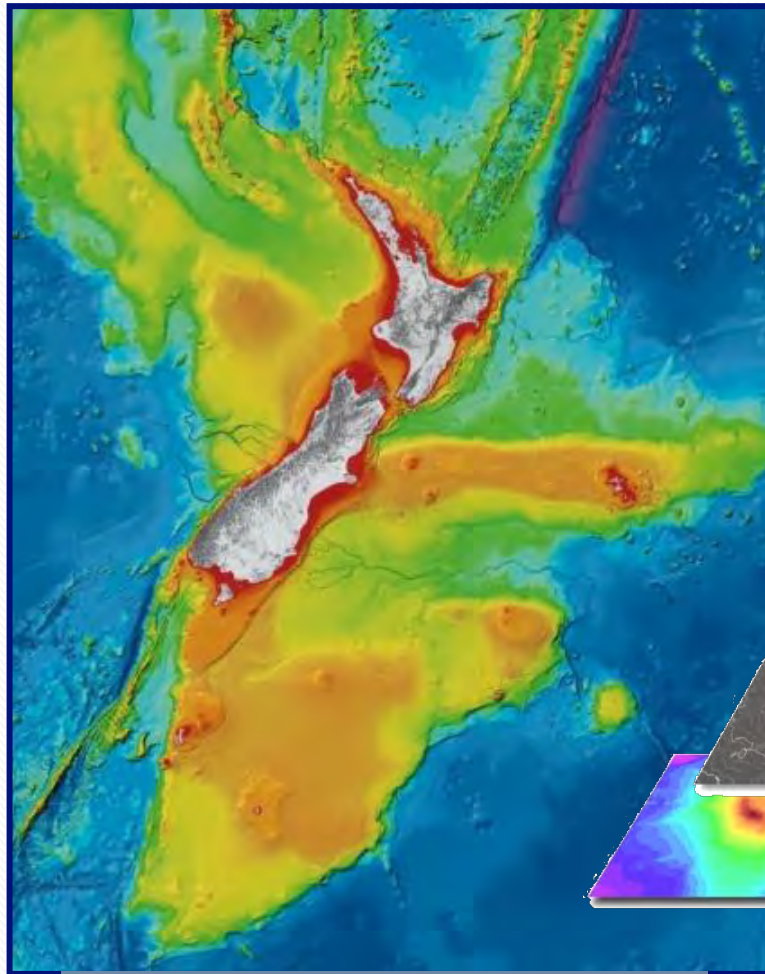
Seafloor Sampling

- Gravity / piston corer
- Kullenberg corer
- USNEL-type box-corer
- Seafloor Grabs
- Multicorers
- Epibenthic sleds
- Rock dredge

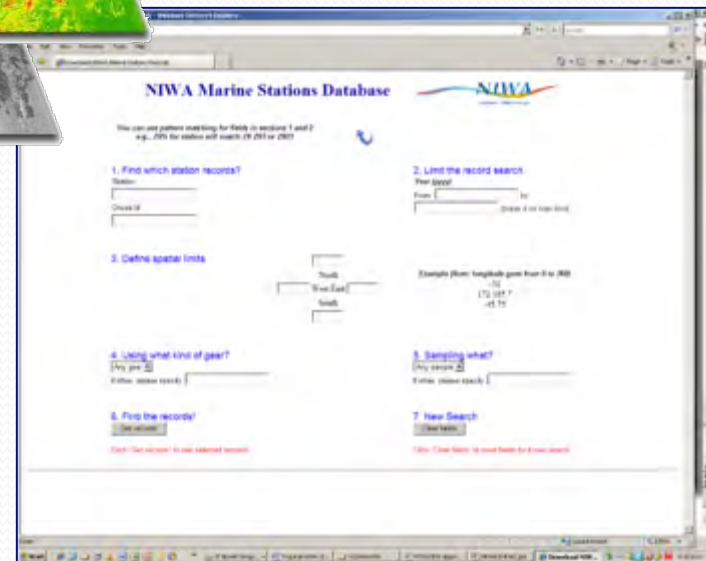
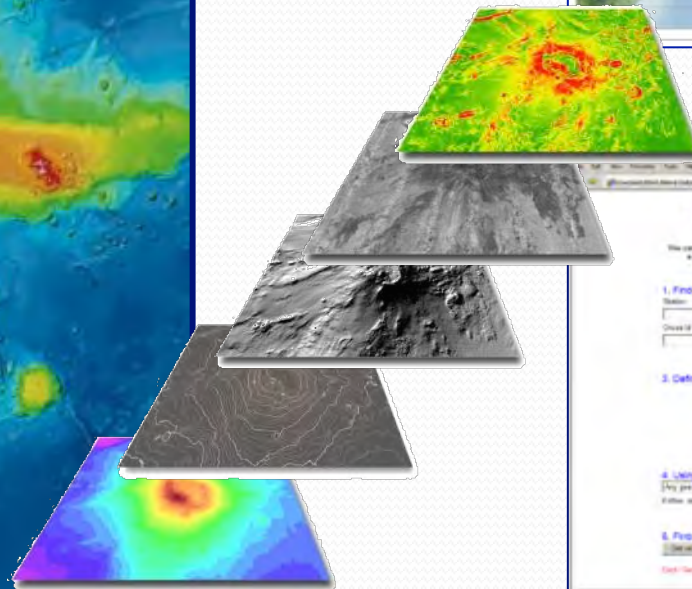


Bathymetry database

www.bathymetry.co.nz



More than a pretty picture!



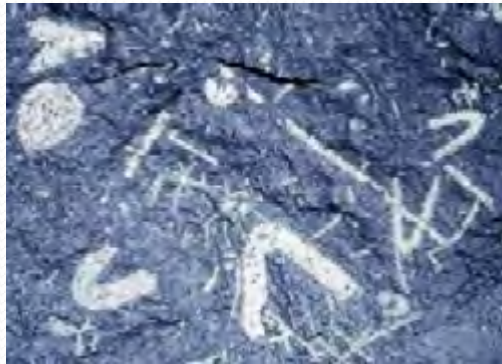
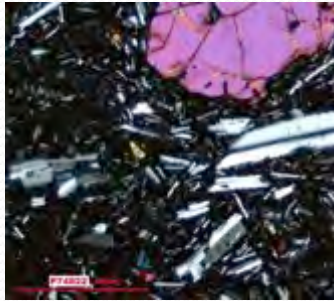
- Charting and seafloor maps
- Web-serving of data
- GIS Database

Geological Databases

pet.gns.cri.nz

1 – PETLAB

- NZ rock catalogue and geoanalytical database
- offshore and onshore
- Contains 177,141 sample records;
- 48284 have analytical data (on 9 Apr. 13)



www.fred.org.nz

2 – FRED

- computer database for the New Zealand Fossil Record File
- Contains all 96354 locality records registered at regional recording centres since 1946, and was last updated on April 10, 2013.

3 - IODP

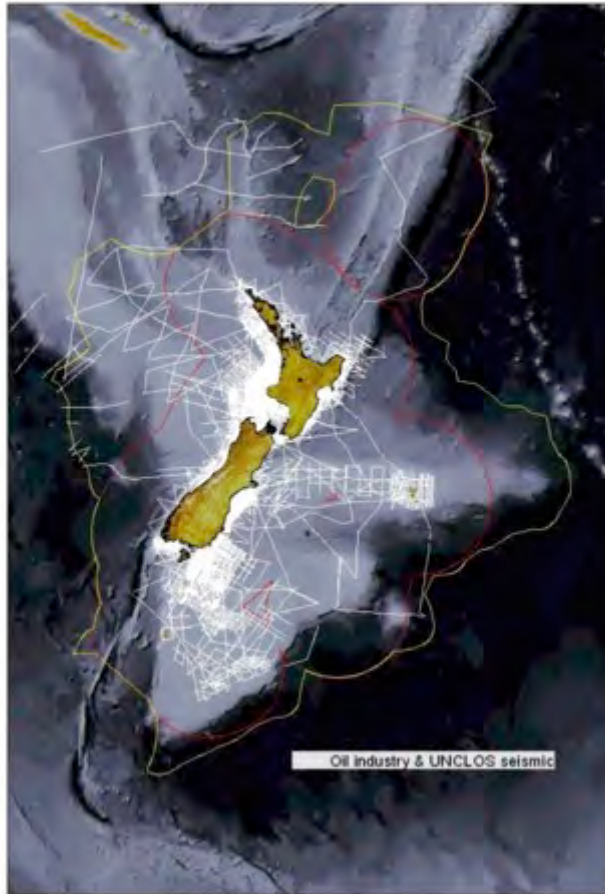
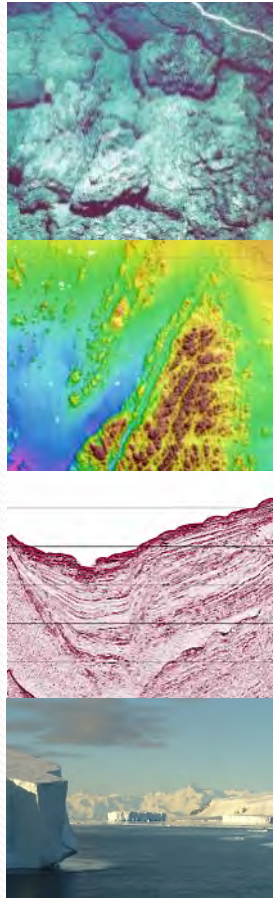
Micropaleontology

Reference Centre

Publicly available

Seismic Data

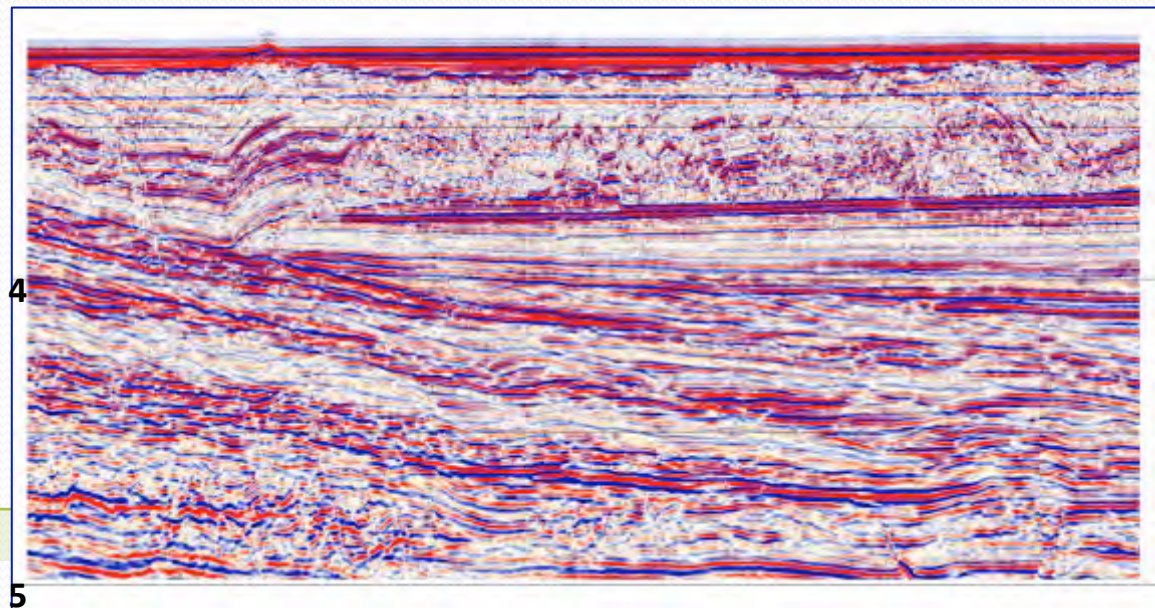
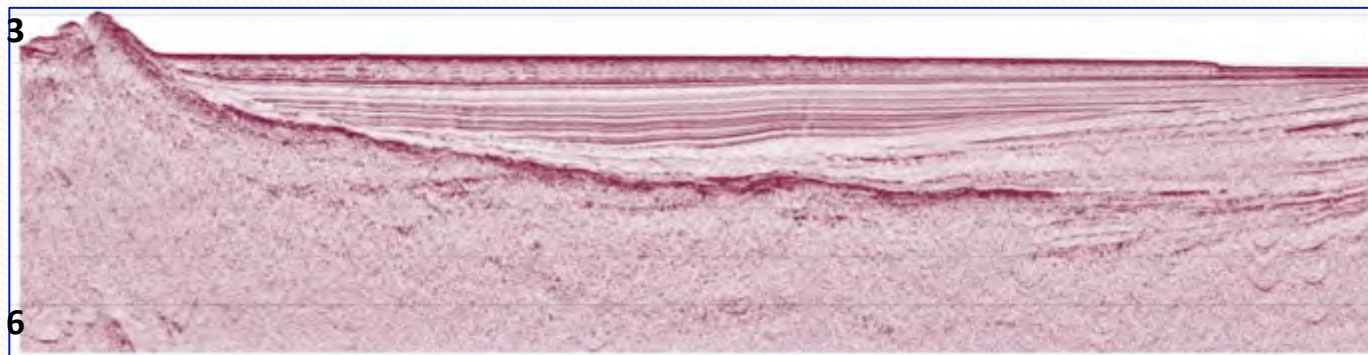
- New Zealand Petrol & Mineral <http://www.nzpam.govt.nz>
- GNS Science
- NIWA



Old or with limited penetration
below the sea floor

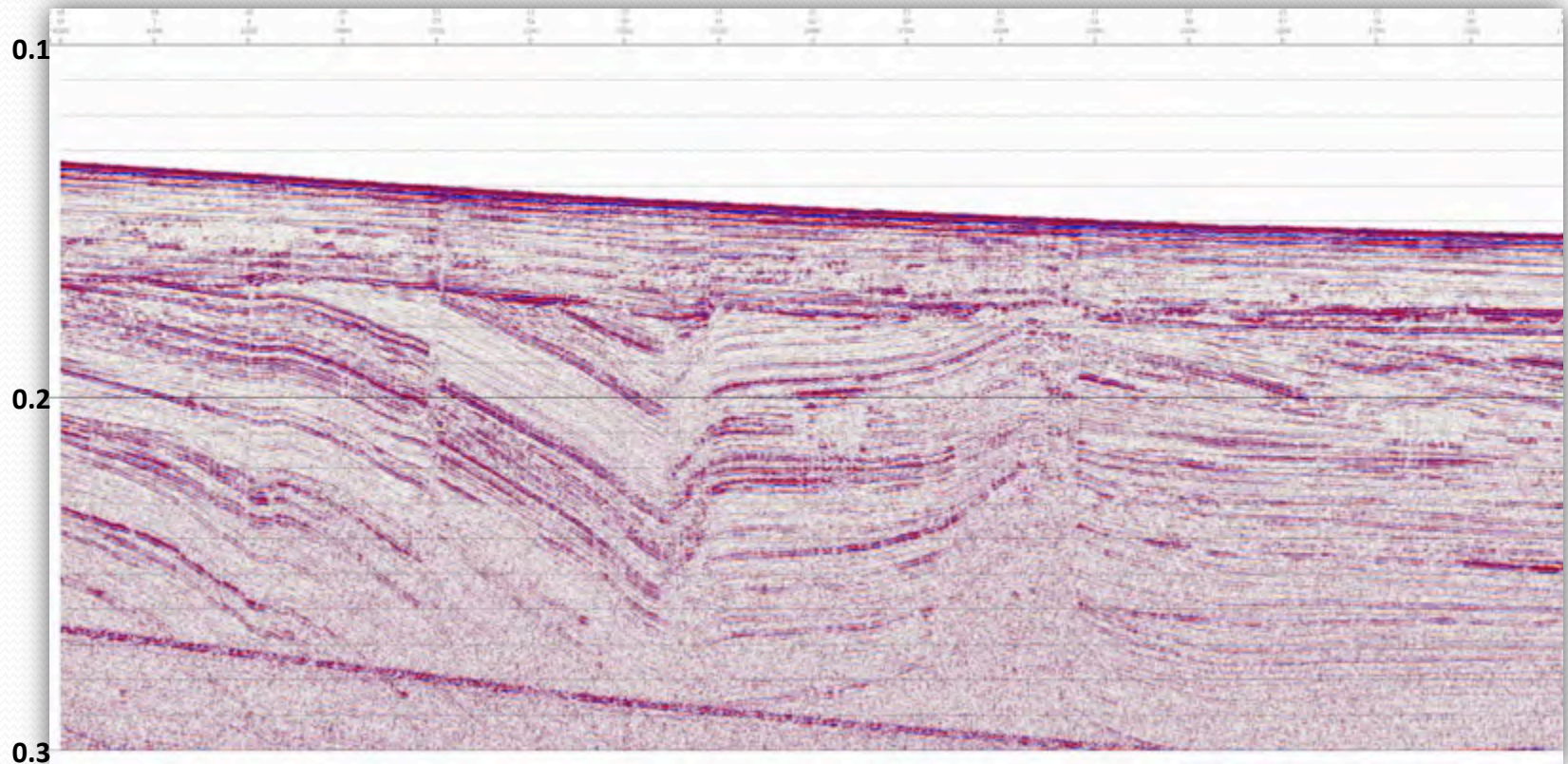
Data collected beyond areas of
recent exploration interest
often old and of poor quality

NIWA Multi-Channel Seismic



Geometrics Inc. Digital Streamer
7 x 100m active sections
48 channel; 12.5m group spacing
GI Gun 210 cu.in. G: 105 / 150 / 250 – I : 105

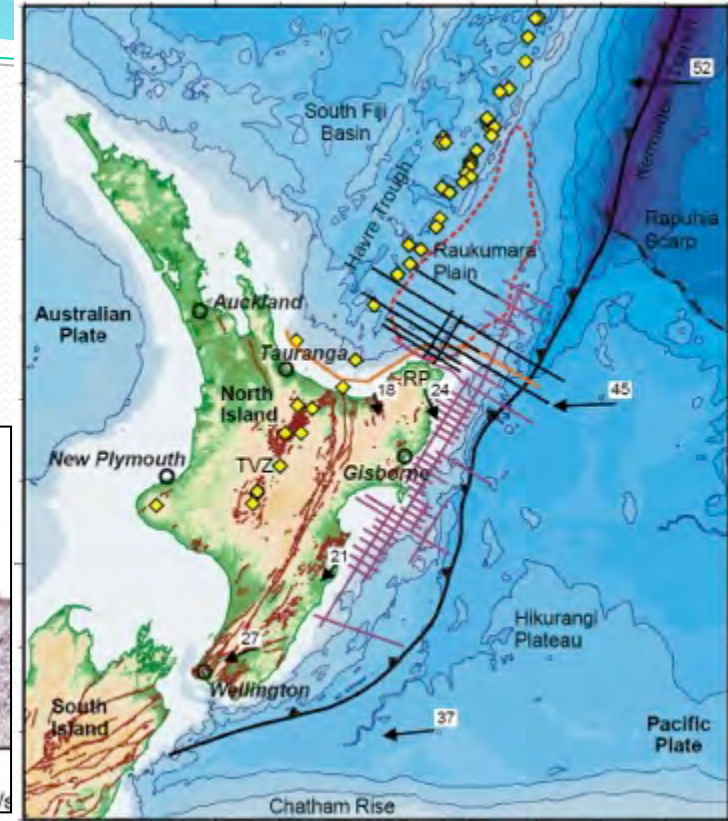
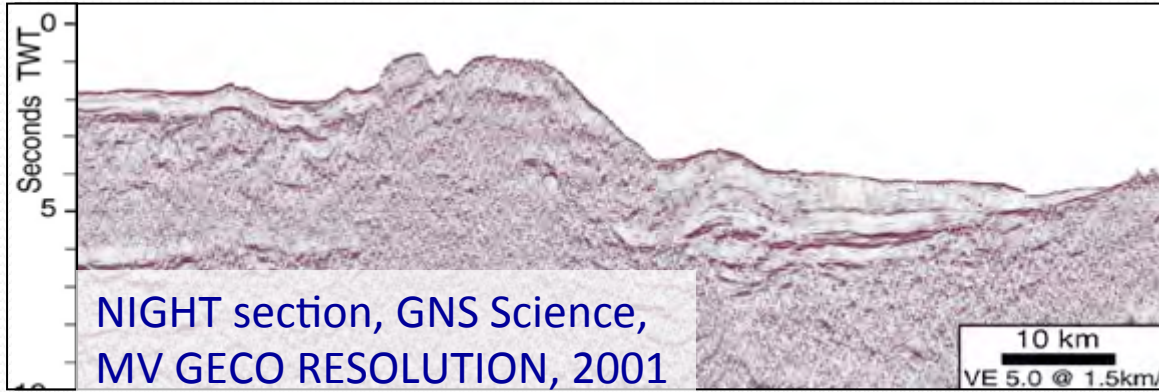
High-Resolution Seismic Reflection (Boomer)



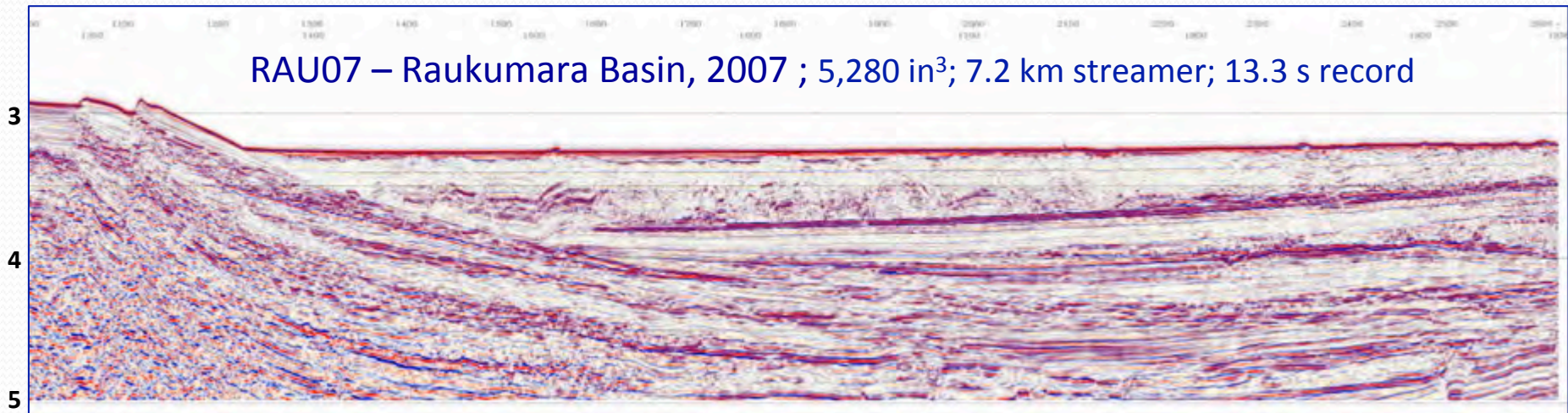
Applied Acoustics Engineering Boomer CSP300
300J (100, 200, 300 and 350 Joules)
GEOEEL digital towed hydrophone
16 channels; 1.5625m interval

Industry Standard

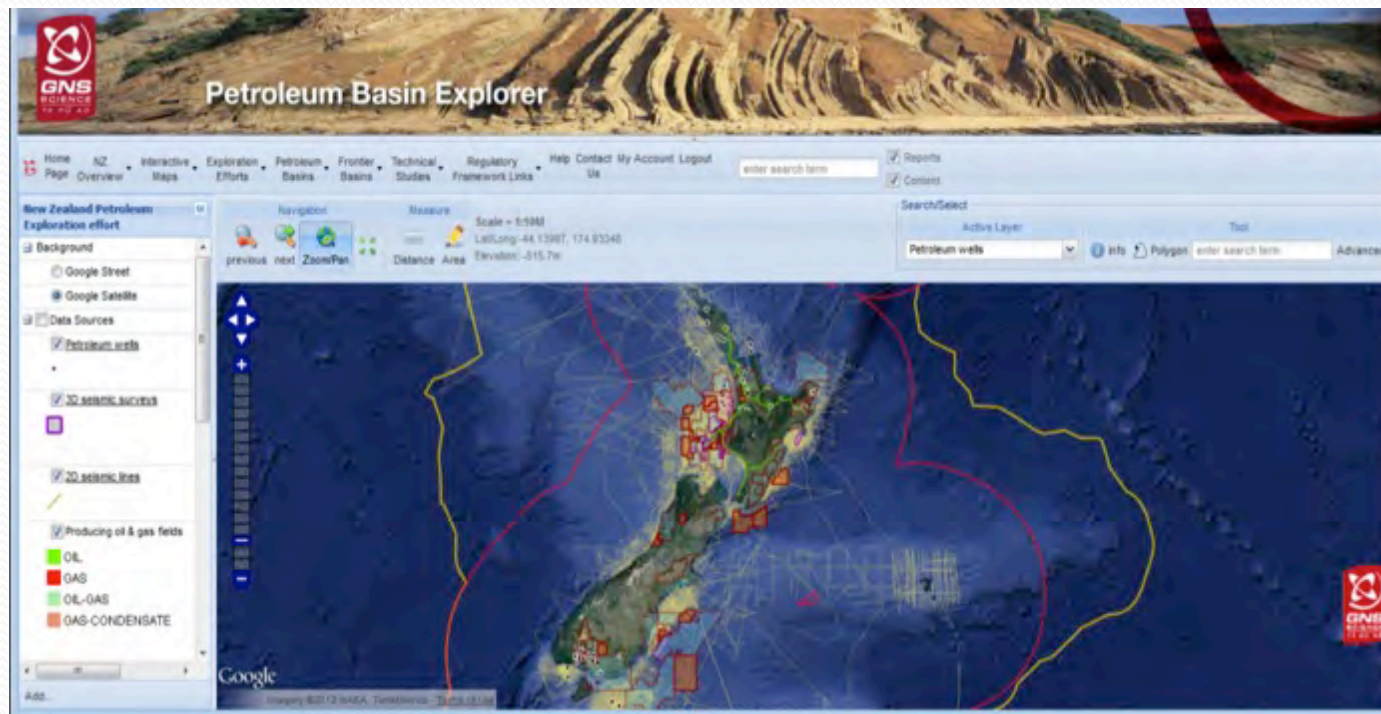
New Zealand Petrol & Minerals GNS



RAU07 – Raukumara Basin, 2007 ; 5,280 in³; 7.2 km streamer; 13.3 s record

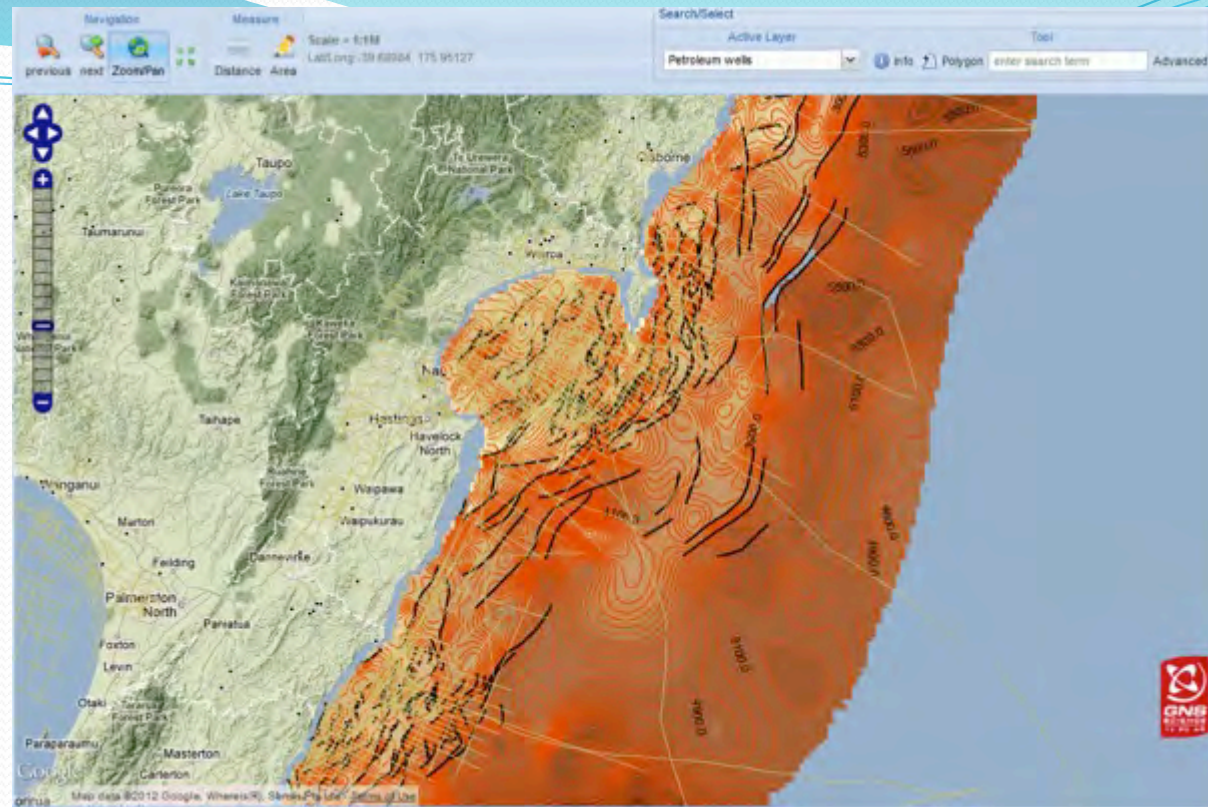


Petroleum Basin Explorer (release 2015)



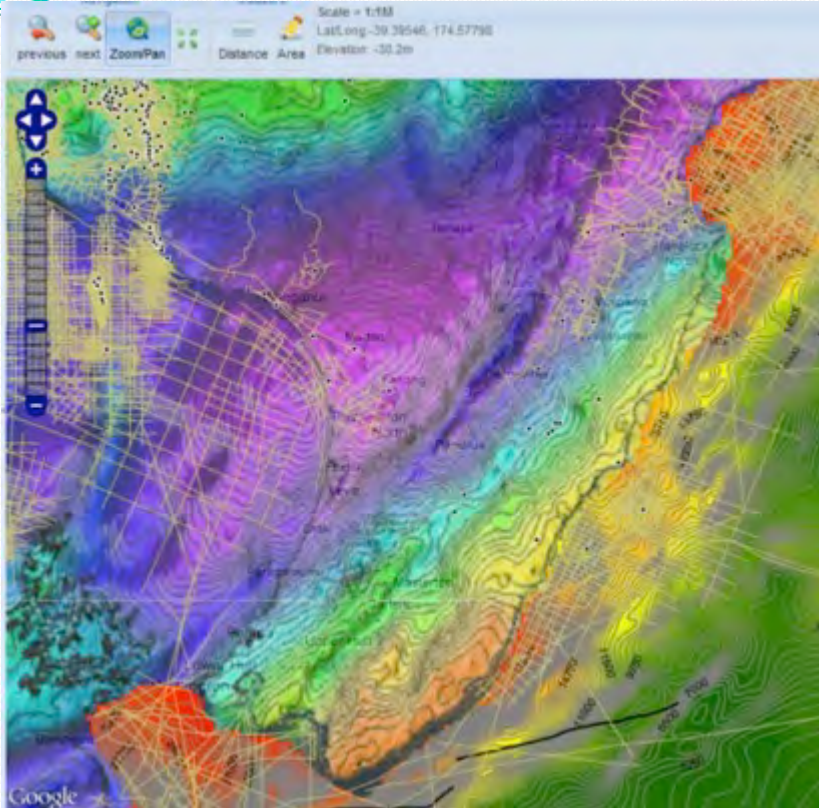
- Desk top web-portal & geospatial information delivery tool (GNS Science)
- Web based map publishing of structured data + Google maps
- Enables scientists to design, build and deliver science through web-portals
- The first being for the Petroleum Industry.
- Links to data, custodians, regulatory information, & technical studies

Petroleum Basin Explorer



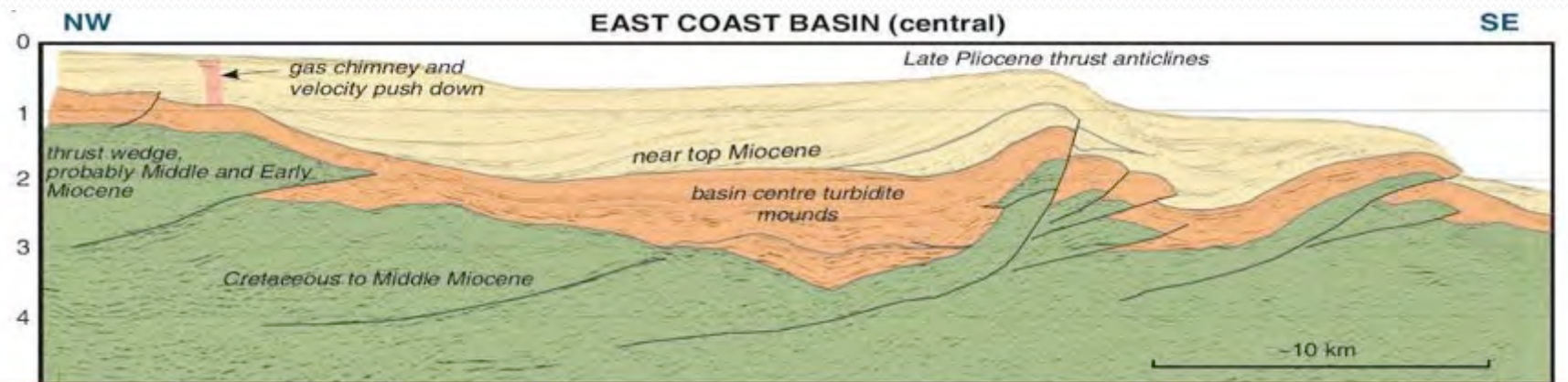
- 564 registered users (31 Oct)
- 225 outside NZ from 31 different countries
- 70 Global Exploration companies
- has over 200 visits a month
- has distributed over 900 free technical reports and data products since July

Petroleum Basin Explorer

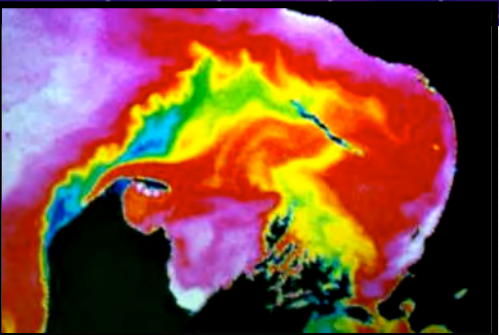
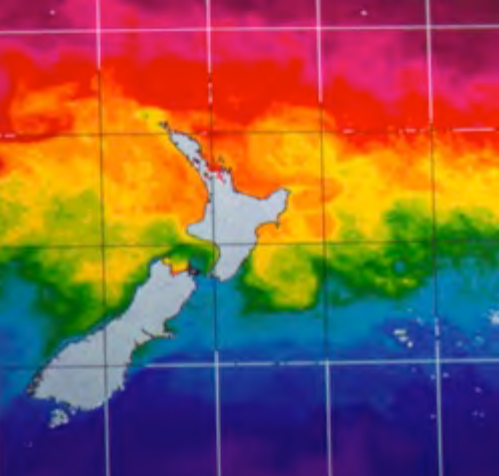
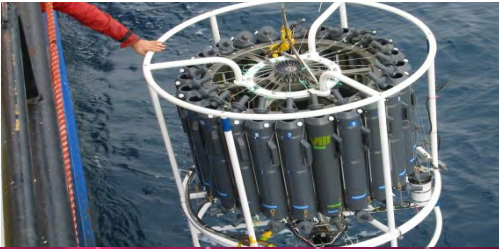
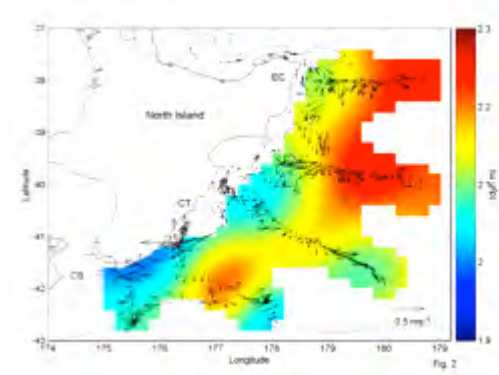


Interactive maps & metadata for:

- Exploration well
- Seismic survey and sample images
- Geological coverage
- Isochrons, Isopachs, Depths
- Gravity and Magnetics
- Swath imagery
- Iwi boundaries and local governing body boundaries



Physical Oceanography

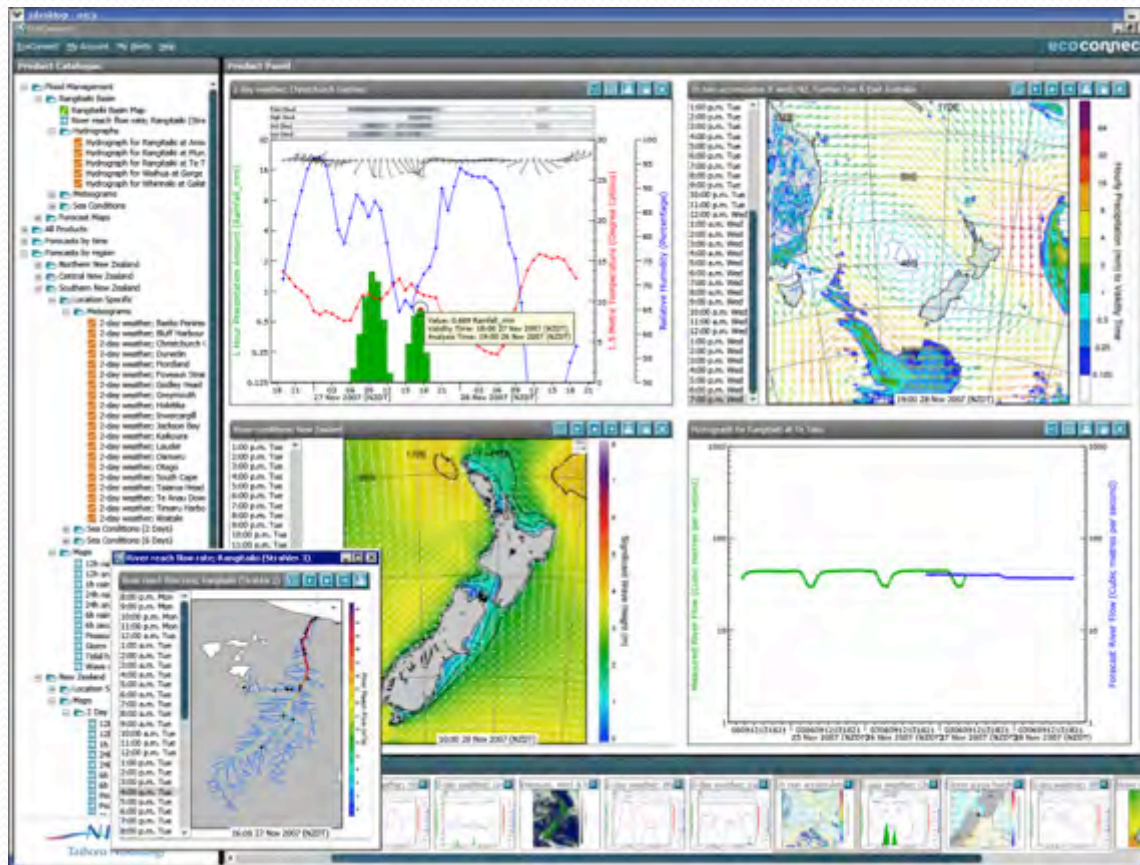


- Measuring and predicting ocean variability and change in the SW Pacific
- Links to climate and weather predictions
- Vessel surveys, moorings, satellite time-series, international programmes, modelling
- ARGO (SIO, UoW, CSIRO); XBT lines (SIO)

Physical variables important for prediction and detection

Coastal & ocean forecasting

- Waves, winds, tides
- *Rainfall, river flows*
- Tsunami, storm surge, inundation
- *Search & Rescue, Health, Aquaculture*



ANZIC



Australian and New Zealand IODP Consortium

Australian and New Zealand IODP Consortium Created in 2008

- ❖ NZ, as part of ANZIC, will participate in the new IODP programme beginning 1 Oct 2013
- ❖ GNS Science, Victoria University of Wellington, Otago University, University of Auckland, and NIWA
- ❖ A number of proposals in the New Zealand region, related to GeoPrism objectives, have been proposed or being developed.



Summary

- 60 years of ocean-focused research in New Zealand, Australia, Pacific, Southern Ocean and Antarctica from NZ research organizations (GNS, NIWA, Universities) and government departments.
- Vessel based surveys and studies from coastal to deep ocean
- Covers marine geophysics and geology, hydrography, physical oceanography, environmental and biological studies, marine climate and forecasting, etc.
- Most data freely* available , usually online
- Major repository of national marine data
- NZ now part of IODP

*: 2-5 yrs moratorium sometimes applies

Public Funding Agents
NZ\$833 m (2012-13)

Other
Governments
Organisations

New Zealand

8 Crown
Research
Institutes

8 Universities

10 Centres of
Research
Excellence

9 Independent
Res. Inst.

Research System

- MBIE - SIG
- RSNZ
- TEC
- Callaghan Innovation
- MPI
- HRC

International
Collaboration and
Responsibilities

Business and
Industry