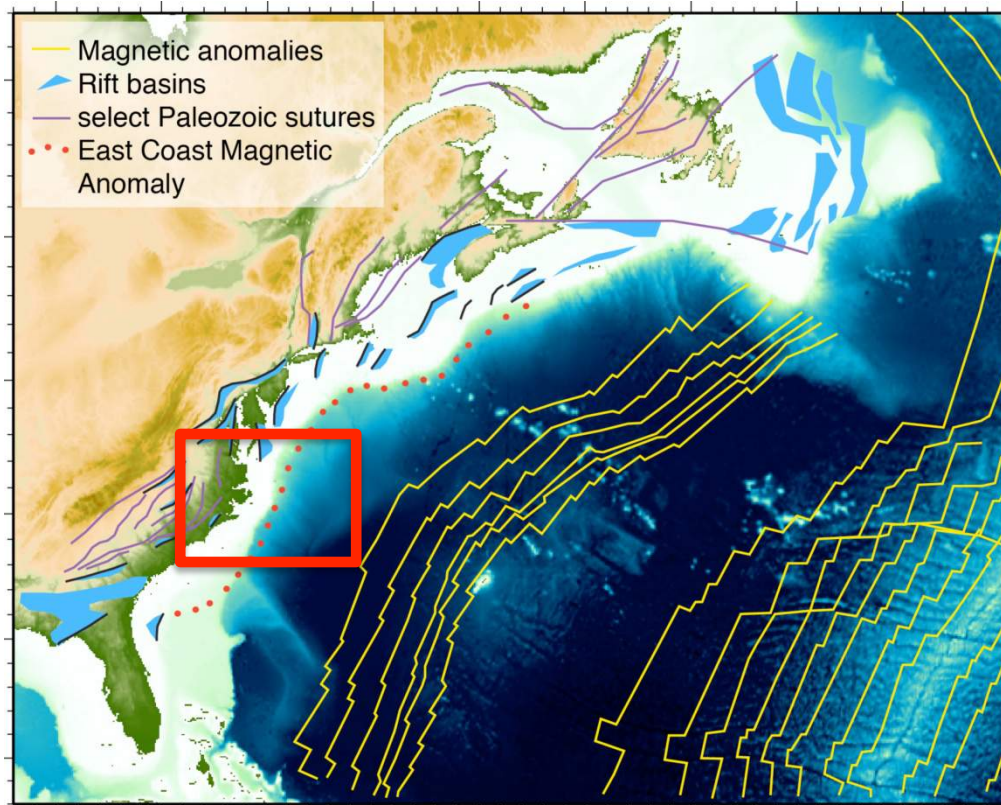
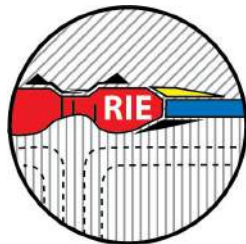


The Eastern North American Margin (ENAM) Community Seismic Experiment



ENAM CSE team:

Harm Van Avendonk (UT Austin),
Beatrice Magnani (SMU), Donna
Shillington (LDEO), Margaret Benoit
(TCNJ), Brandon Dugan (Rice), Jim
Gaherty (LDEO), Matt Hornbach
(SMU), Dan Lizarralde (WHOI),
Maureen Long (Yale), Steve Harder
(UTEP), Anne Becel (LDEO), Gail
Christeson (UT Austin).



*Geodynamic Processes
at Rifting and
Subducting
Margins*

Science goals for an ENAM CSE:

- To understand the roles of inheritance and magmatism on rifting and rupture.
- To understand margin evolution from rifting to surface processes and active tectonics today.

Other goals of the ENAM CSE:

- Provide an open-access dataset that will be open and useful for a variety of science targets
- Enlarge the number of people taking advantage of marine seismic data through broad training program.

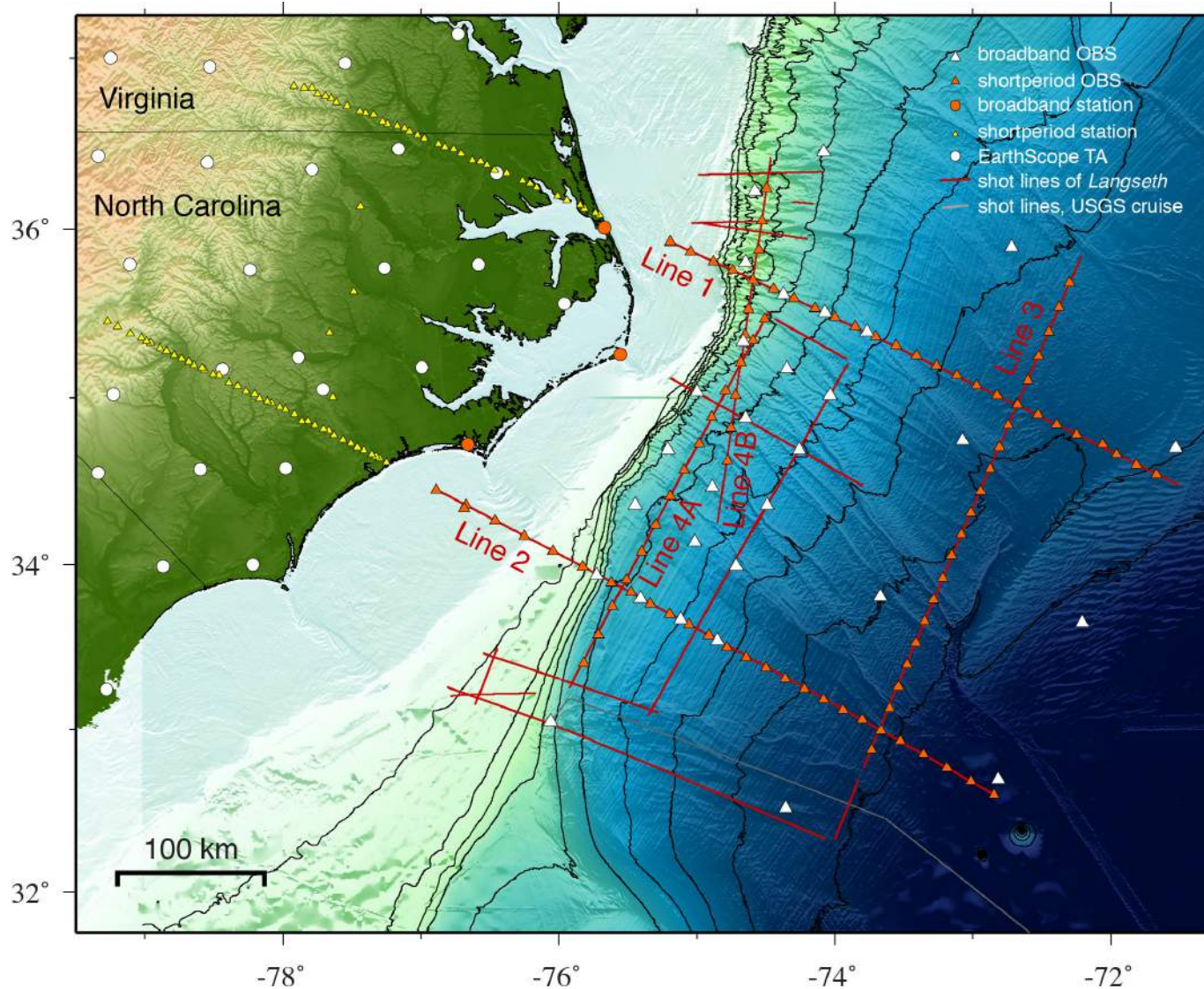
GeoPRISMS ENAM objectives

- *How was deformation distributed throughout the lithosphere on the Atlantic Margins, and how was it influenced by magmatism and preexisting structural and compositional heterogeneity?*
- *How does rift structure and magmatism vary within and between segments along the ENAM?*
- *How do mantle dynamics influence the syn- and post-rift evolution of the margin?*
- *What processes accompanied the transition from late-stage rifting to mature seafloor spreading?*
- *How has the margin been influenced by post-rift tectonics?*
- *What controls the large-scale form of the passive margin?*
- *What are the magnitudes, mechanisms, and timescales of elemental fluxes between the Earth, oceans, and atmosphere along a passive margin during and after rifting?*
- *Is post-rift passive margin morphology self-regulating? What are the scales and frequency of submarine landslides, and what preconditions and triggers landslides?*

History

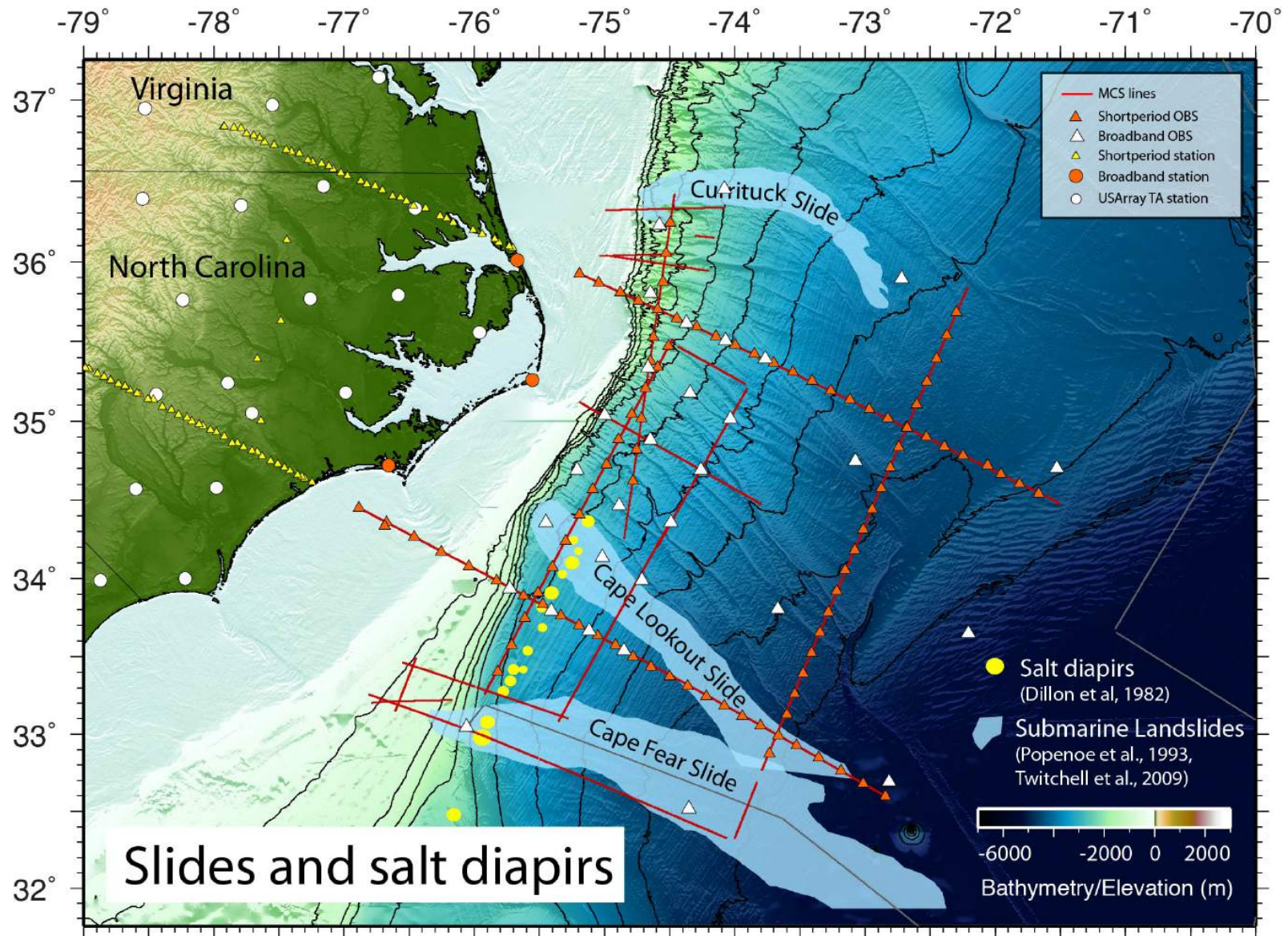
- Community experiment idea for ENAM born at GeoPRISMS ENAM meeting in Allentown, PA in Oct 2011
- Community feedback sought for area of ENAM study – poll used to choose area off North Carolina
- Proposal submitted in July 2012 and funded
- Further community feedback sought on experiment design

Data acquisition



- Deployment of BB OBS in April 2014 aboard the R/V *Endeavor* (planned recovery: April 2015)
- Deployment of BB onshore stations in May 2014 (planned recovery: May 2015)
- Onshore/offshore active source seismic program on R/V *Langseth*, R/V *Endeavor*, and onland in Sept-Oct 2014
- Onshore active-source experiment planned for summer 2015)

Science applications of the community data



R/V Endeavor

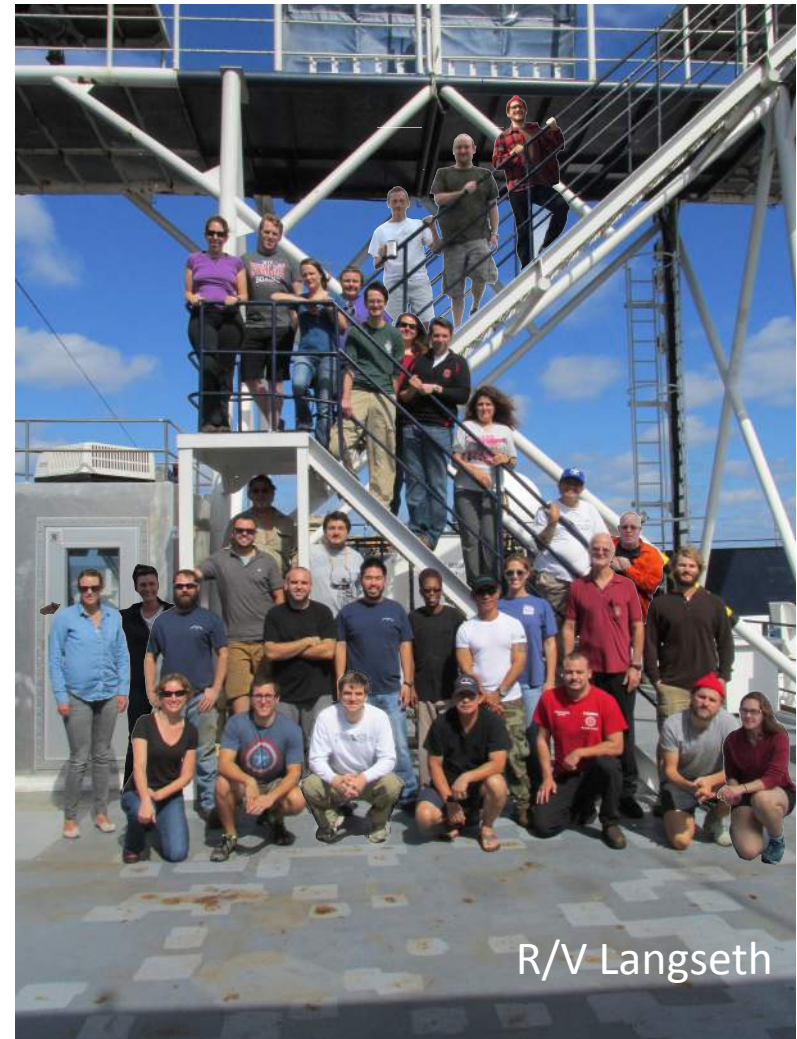


Participants

26 scientists and students involved in addition to PI's



Onshore SP deployment team



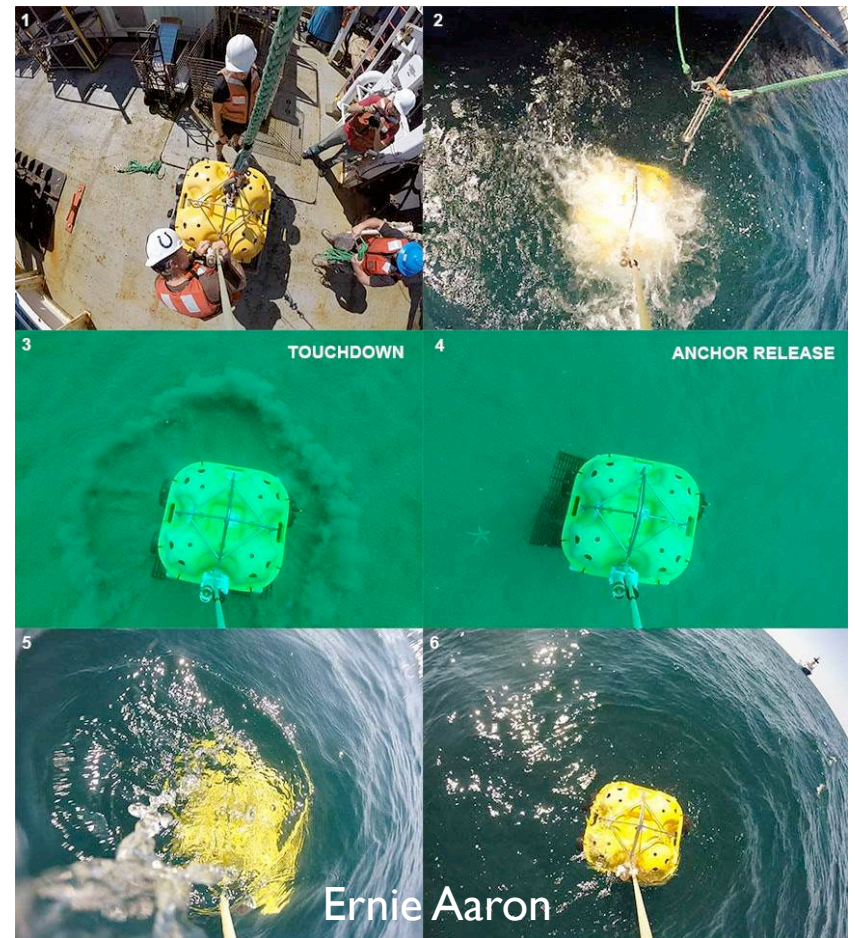
R/V Langseth

On the *Langseth*...

- Training and participation in data acquisition and processing
- Every person processed at least one line
- Science discussions



On the *Endeavor*...



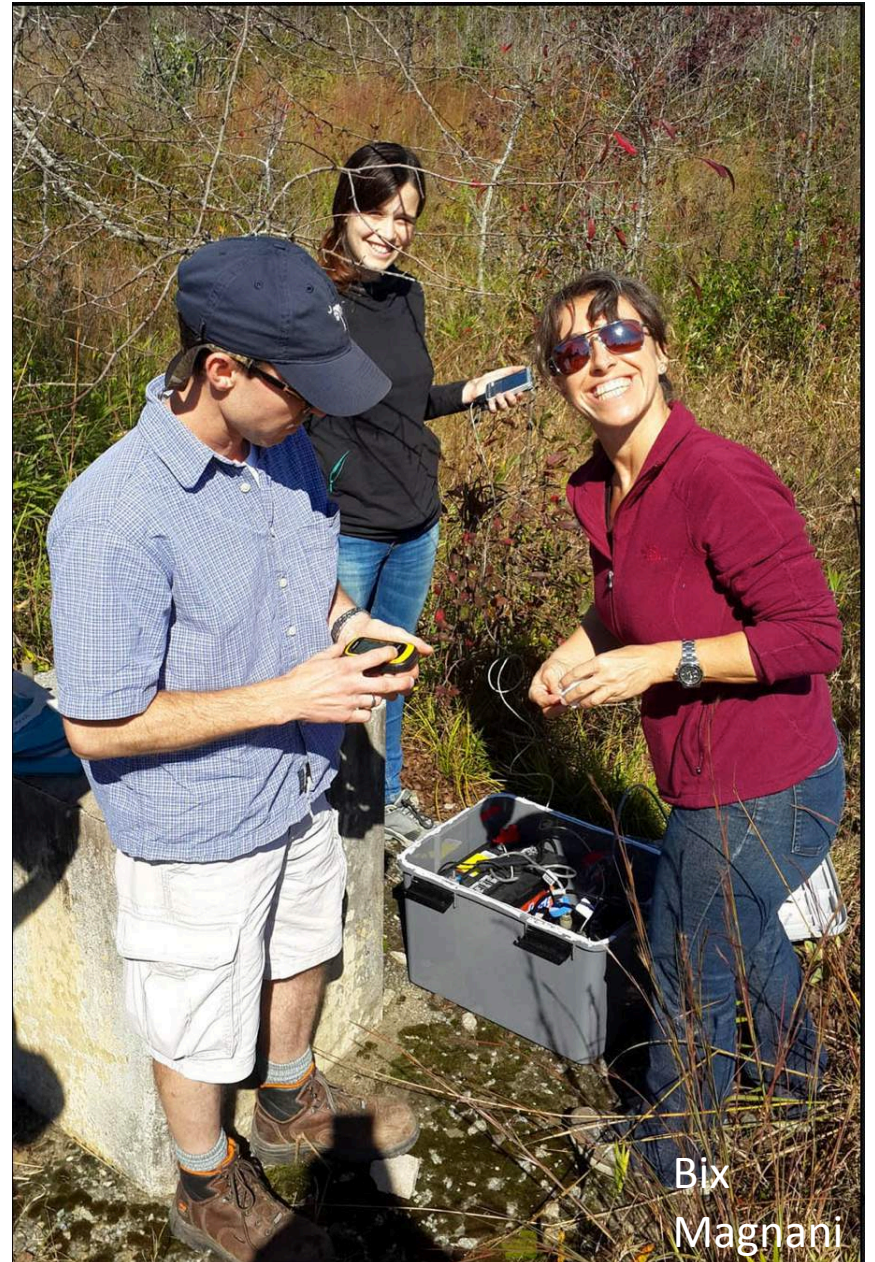
On land... Short period stations in NC and VA



Kara Jones



Bix
Magnani

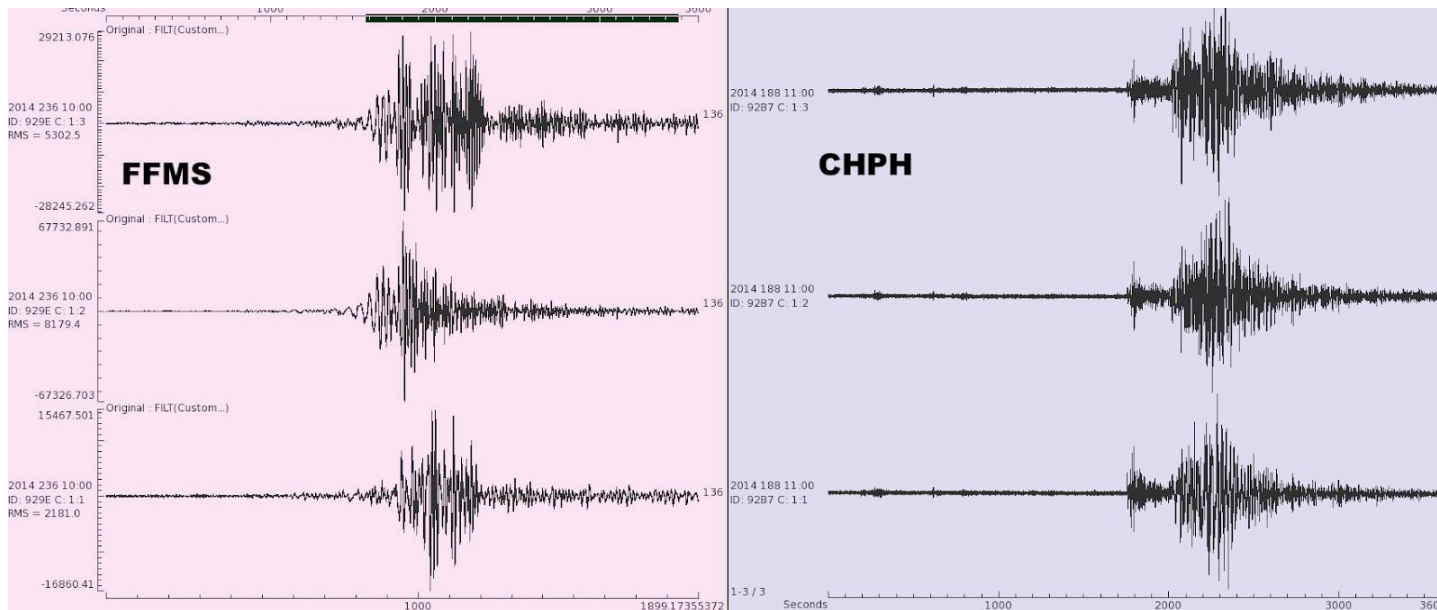


Bix
Magnani

On land... Broadband stations on the Outer Banks



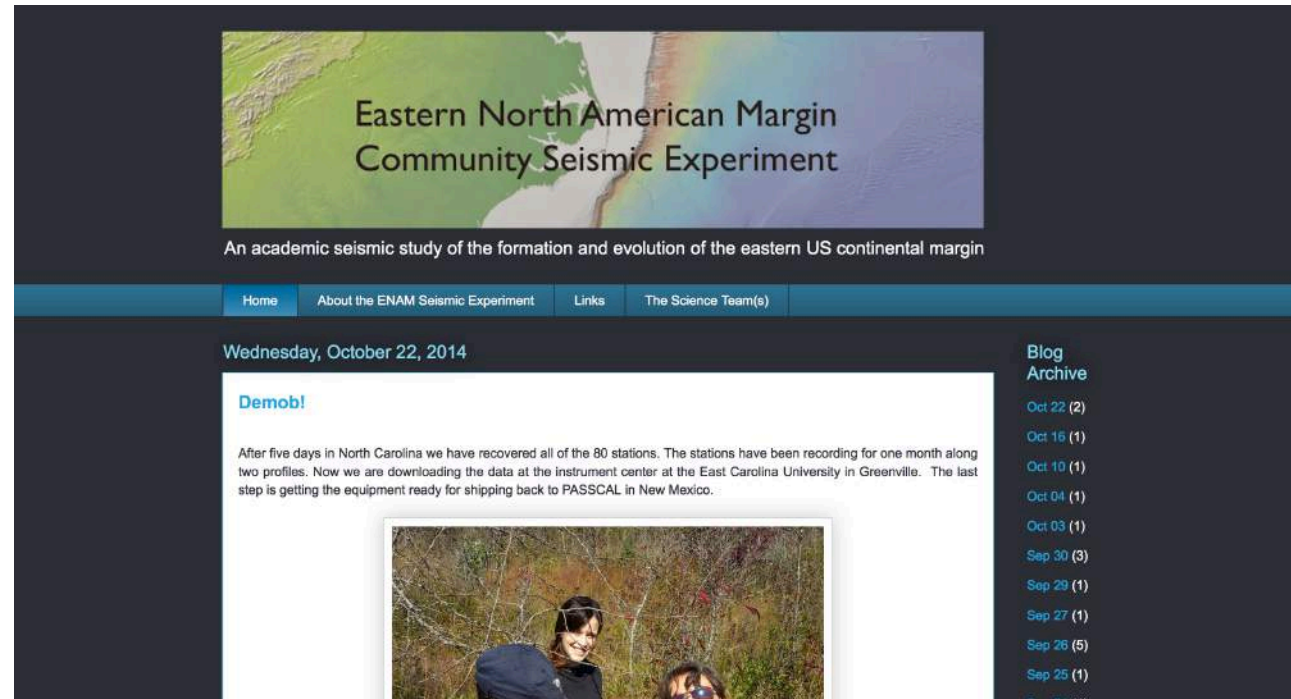
Natalie
Accardo and
Celia Eddy
servicing
Outer Banks
stations



M6.0 Napa
valley
earthquake
recorded on
ENAM
stations

Outreach

- Presentations to schools and other groups during onshore seismic station deployment and servicing
- Website: <http://www.ig.utexas.edu/enam/>
- Field work blog during fall field programs <http://enamseismic.blogspot.com/>
- A few media interviews



Data distribution and future activities

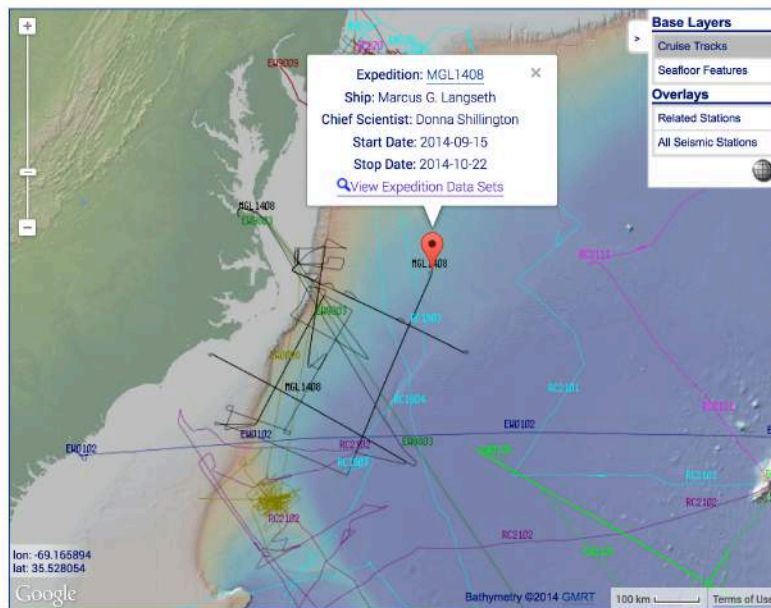
Academic Seismic Portal at LDEO

Portal Links

- Portal Home »
- What's New
- Project Information
- Google Earth Files
- Tutorials
- GeoMapApp
- Virtual Ocean

Access Seismic Data

- Search For Seismic Data
- All multi-channel seismic shot data
- All multi-channel seismic processed data



The Academic Seismic Portal (ASP) is sponsored by the National Science Foundation to organize active source seismic field data into a modern relational data management system accessible through the Internet. The system is designed principally for academic scientific use.

- Data products that are or will very shortly be available for download:
 - Continuous data from onshore/offshore stations
 - Receiver gathers from OBS and onshore stations
 - Raw MCS data from *Langseth*
 - Initial, time migrated reflection sections from the *Langseth*
- Workshops also planned for training and to coordinate science with the data

MARINE GEOSCIENCE DATA SYSTEM

IFEDA

ASP_UTIG

About

Tools & Services

Cart

Data Portals

Contribute Data

ASP_LDEO

Seismic Data Set Status

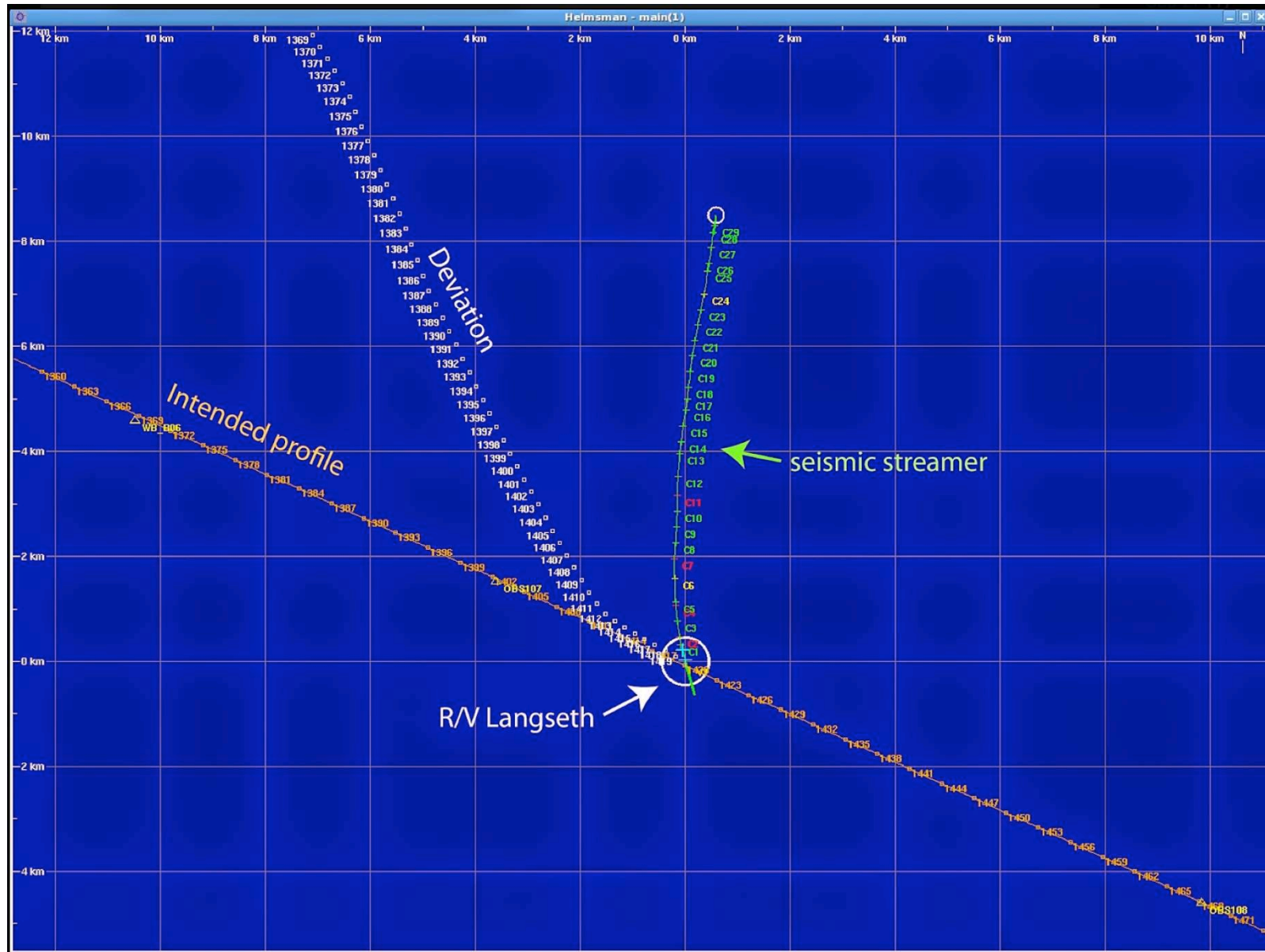
INSTITUTE FOR GEOPHYSICS

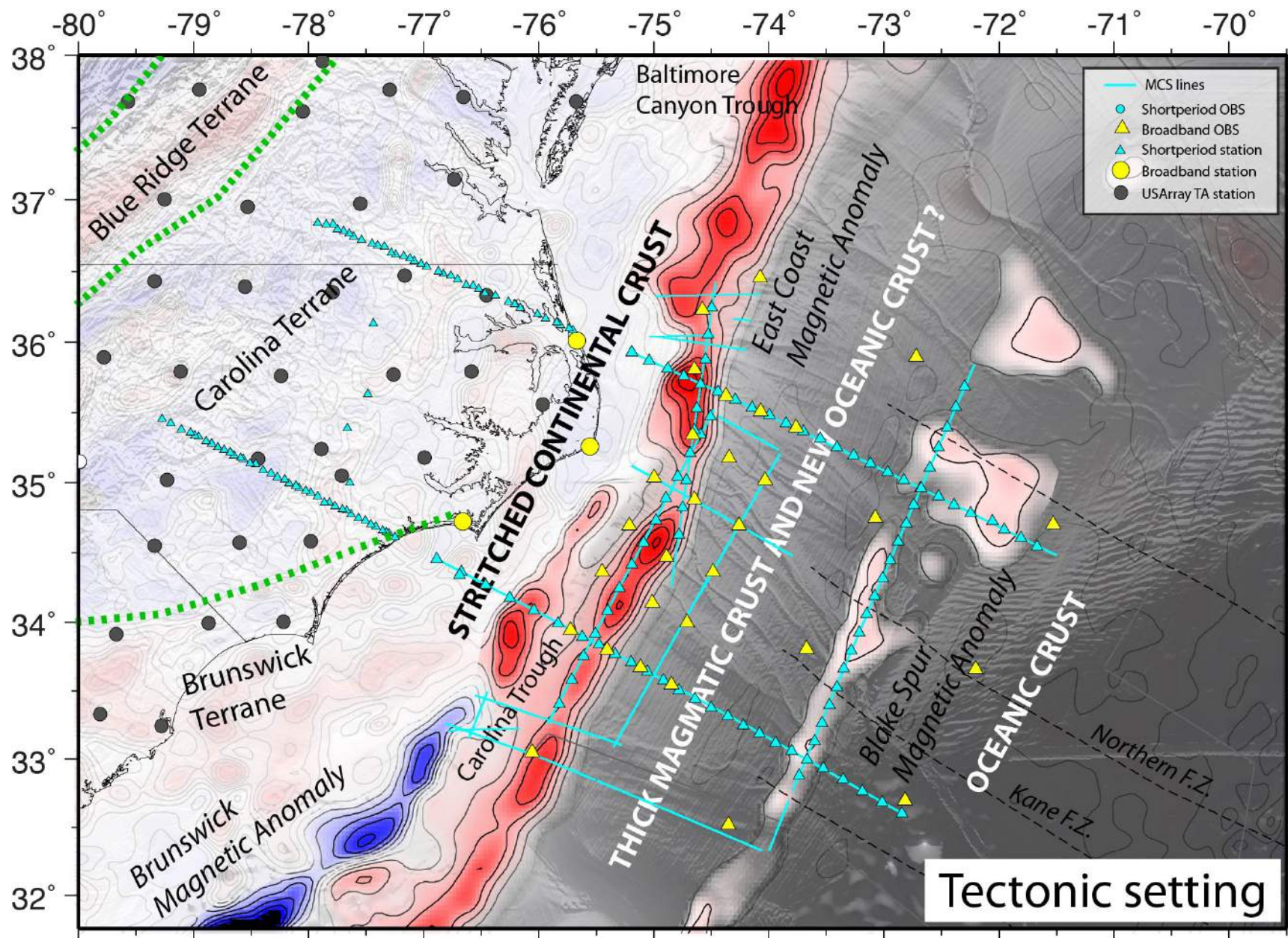
THE UNIVERSITY OF TEXAS AT AUSTIN

Known academic field programs collecting digital seismic data (by [Investigator](#))

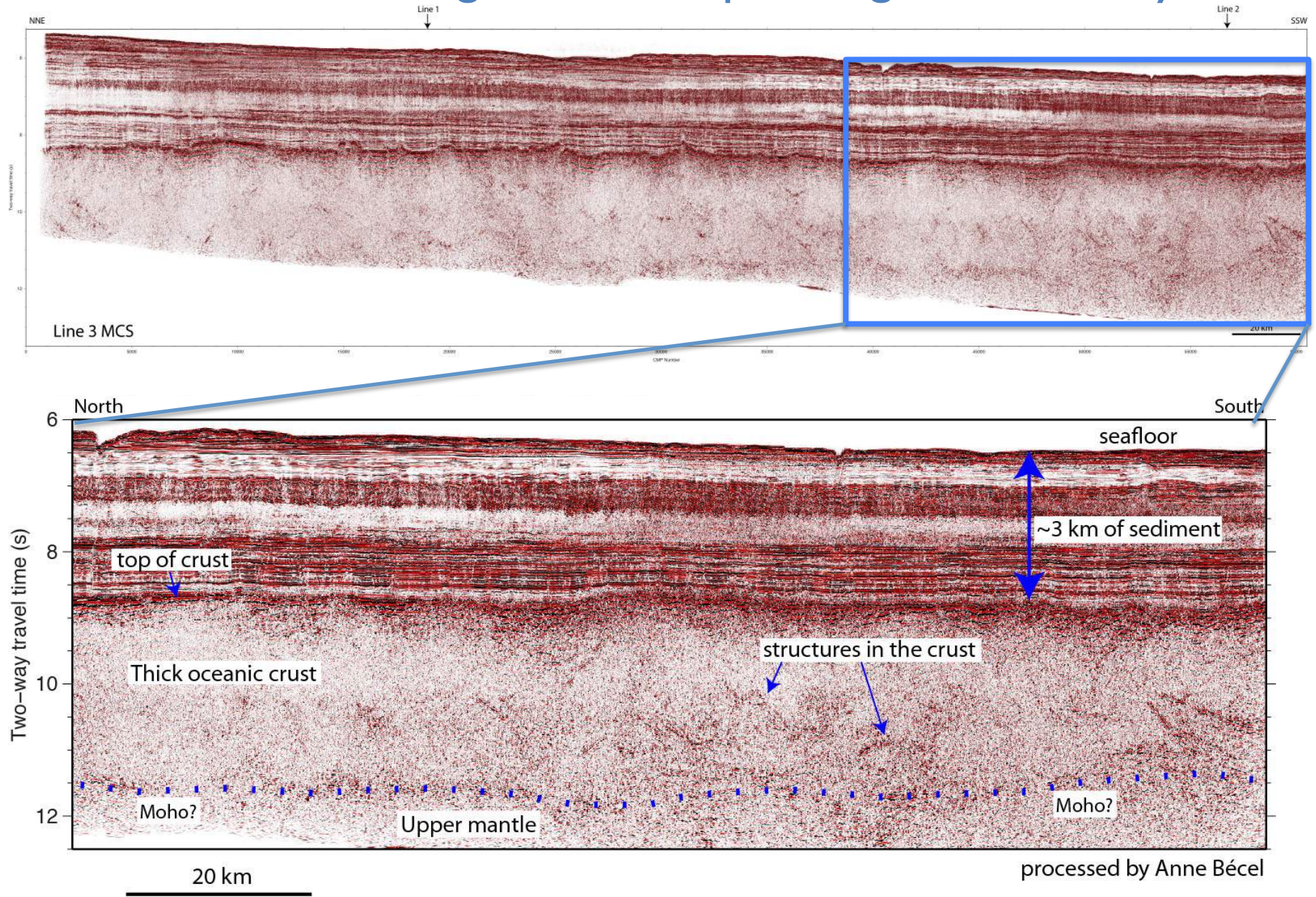
Cruise	PIs (grant#)	Chief Scientist	Start Date	Port/Area/Project	Data Type Acquired (# channels)	Field Data Archive / Status	Processed Data Archive / Status	Comments
MGL1408	Shillington (1347498), Bece (1347498), Hornbach (1348124), Lizaralde (1348242), Van Avendonk (1348454), Dugan (1348228), Long (1347310), Harder (1347024), Gaherty (1347498), Christensen (1348454), Wilts (1348934)	Shillington, Bece, Hornbach	2014-09-15	Eastern Atlantic Ocean	NCS (636: lines mcs01, mcs01a, mcs01b, mcs02, mcs03, mcs31, mcs32, mcs41, mcs42, mcs04a, mcs04a, mcs04b, mcs05, mcs63, mcs71, obs01, obs01a, obs01b, obs01c, obs04a, obs04b 480: lines	LDEO online	UTIG (< 3 yrs) online	In progress

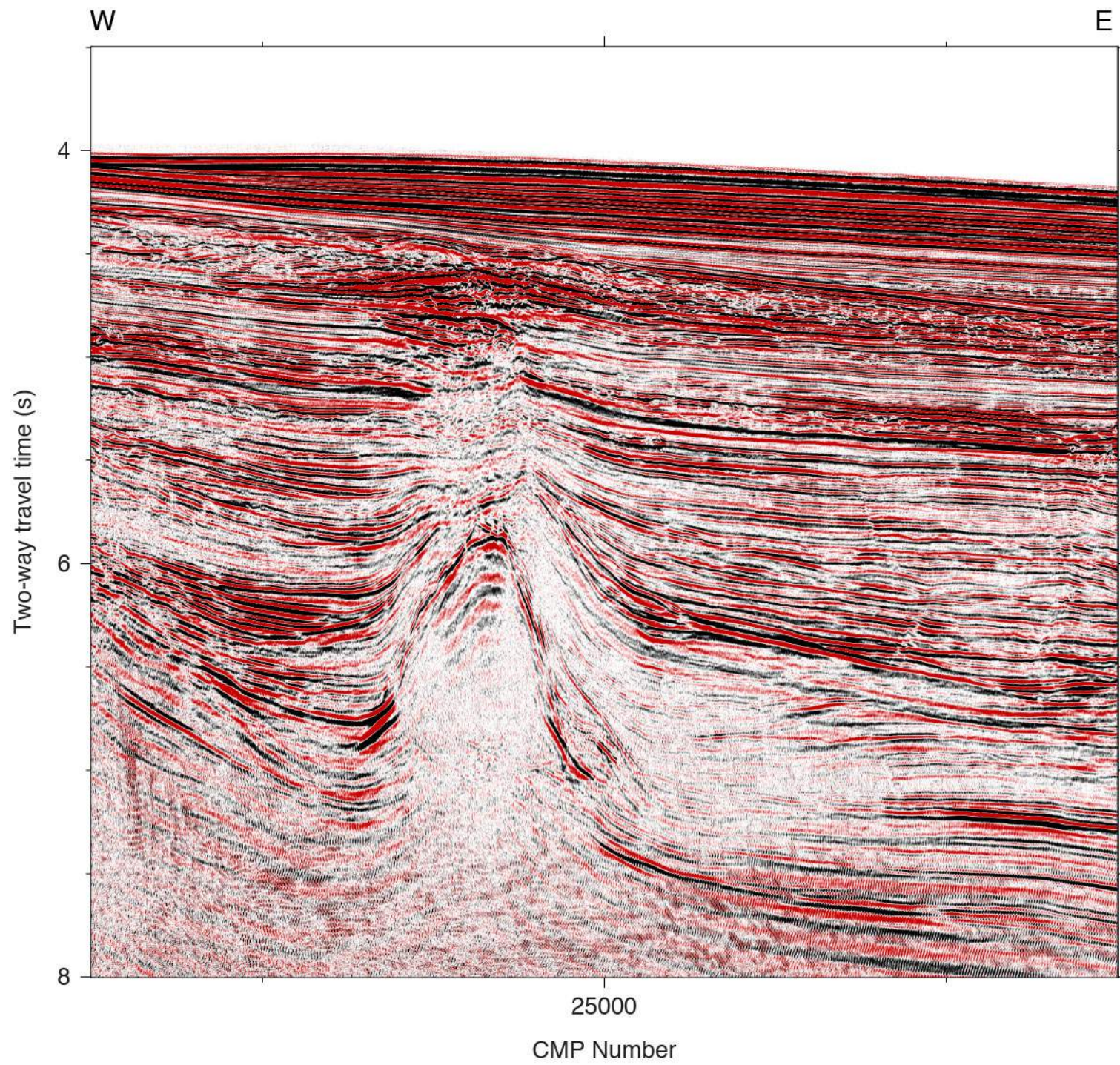
Challenges....

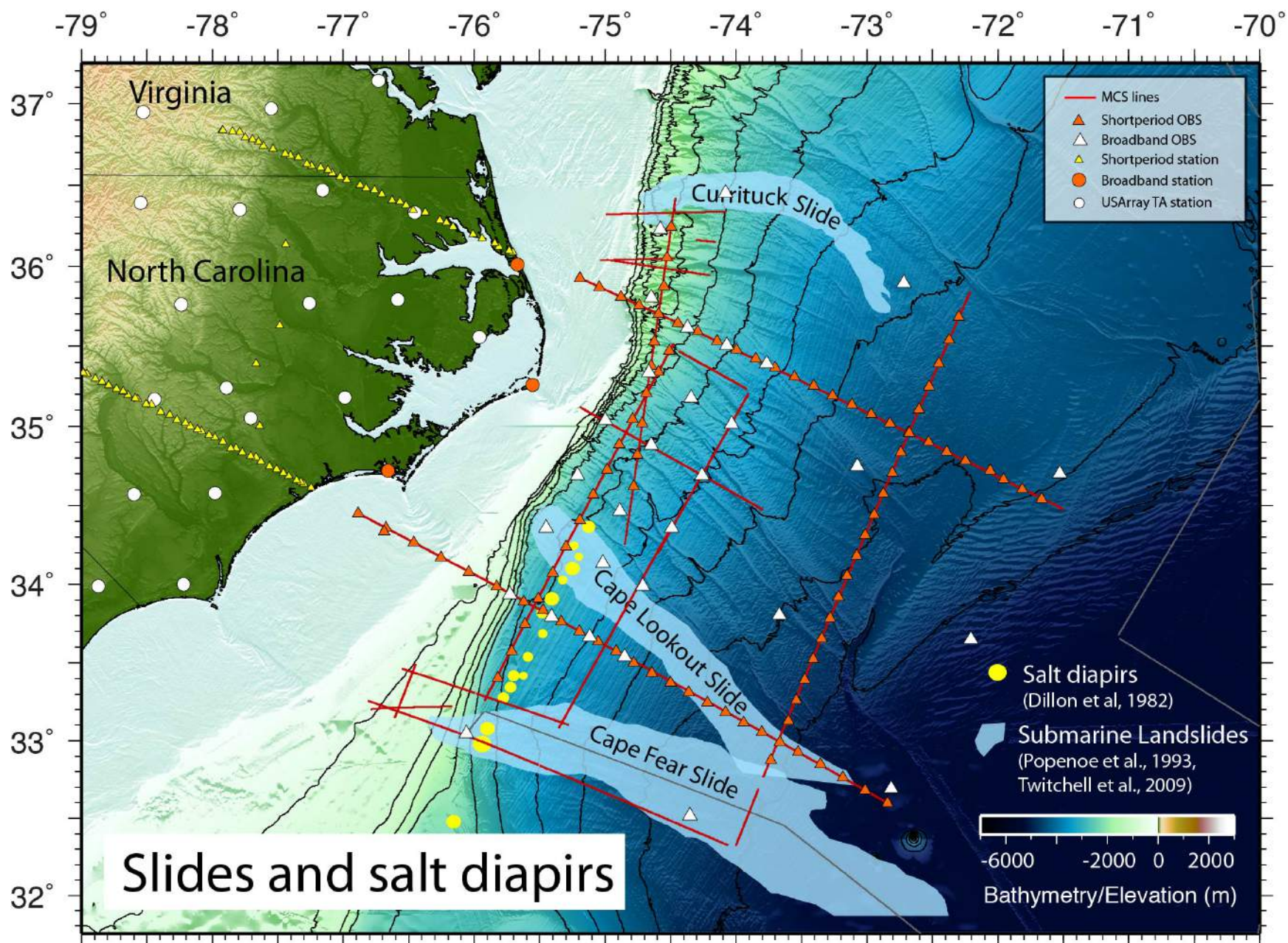


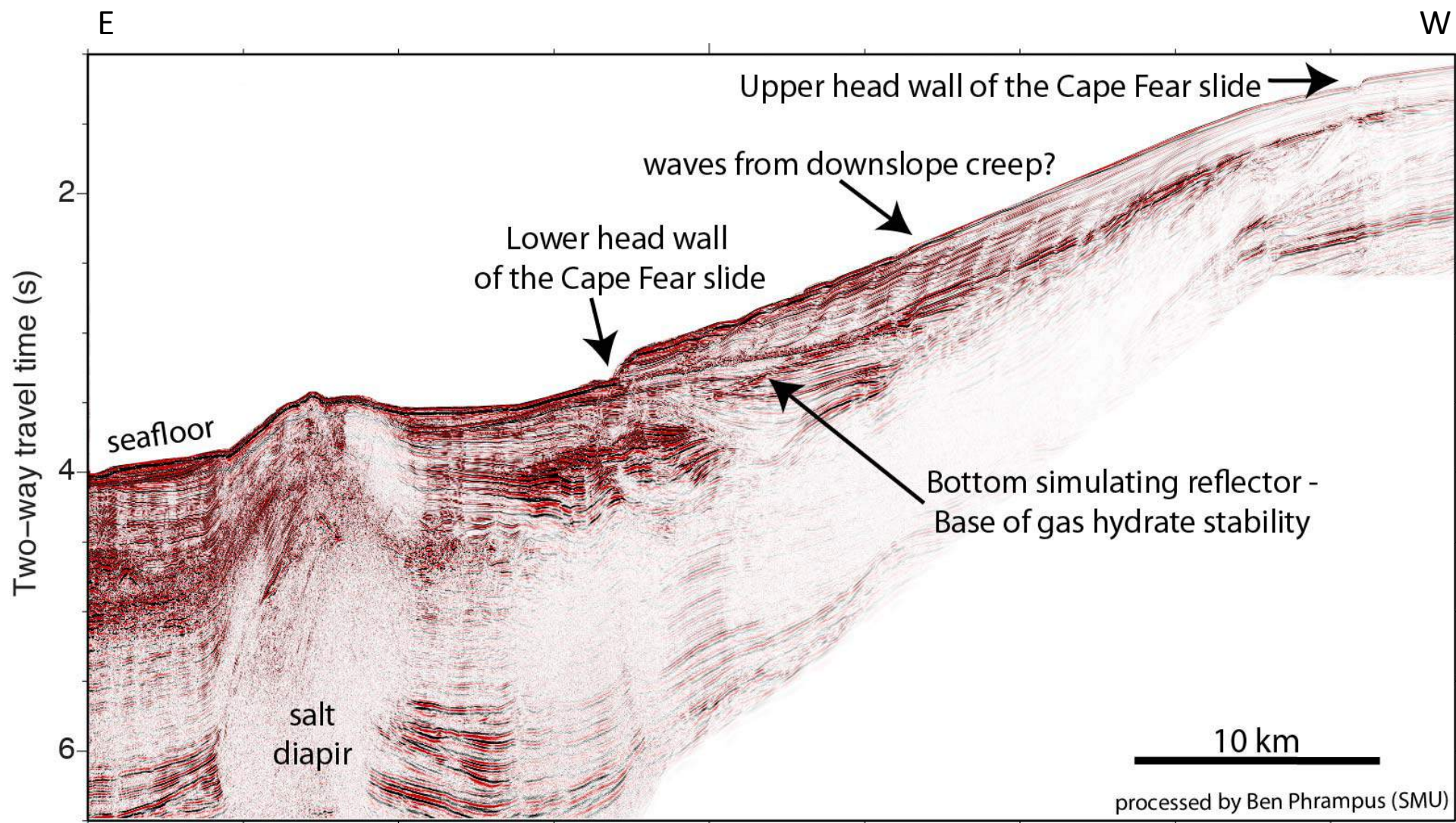


Profile along the Blake Spur magnetic anomaly



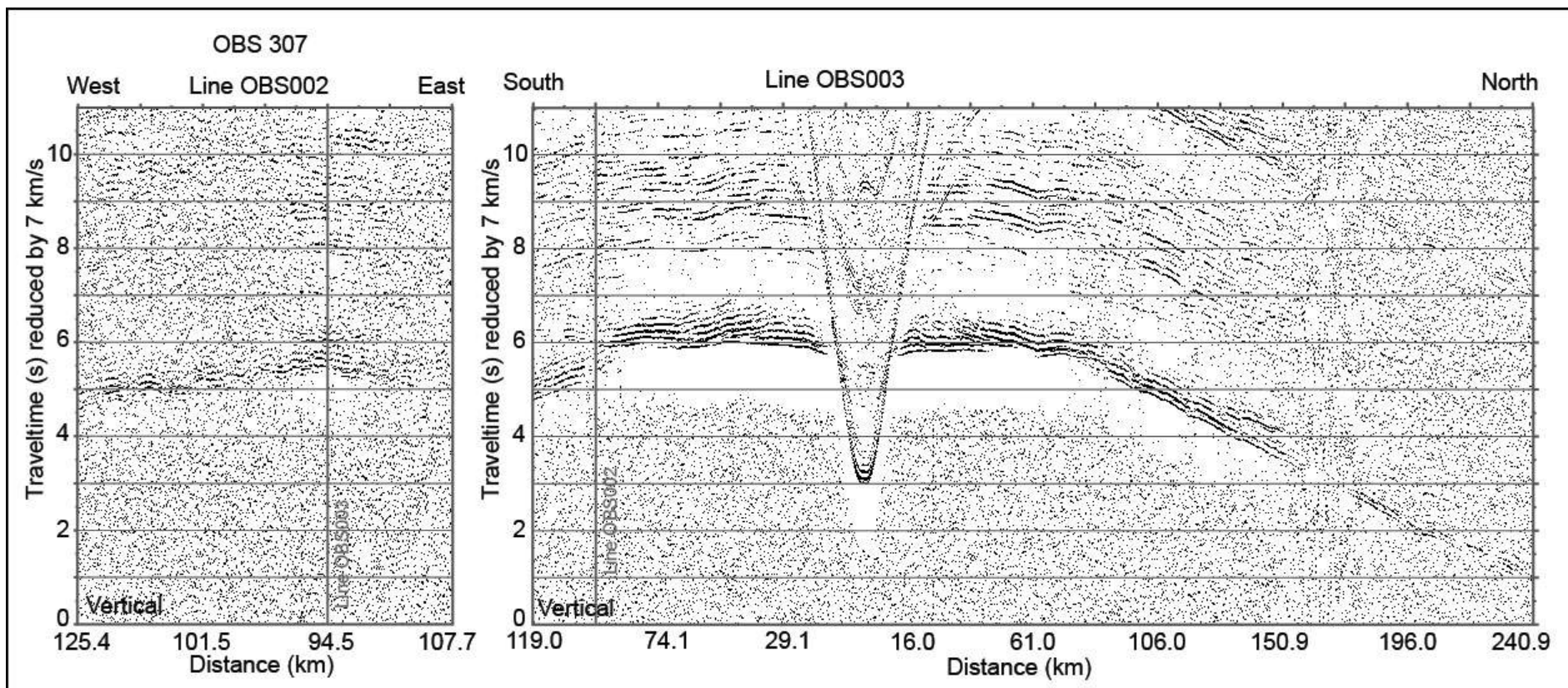




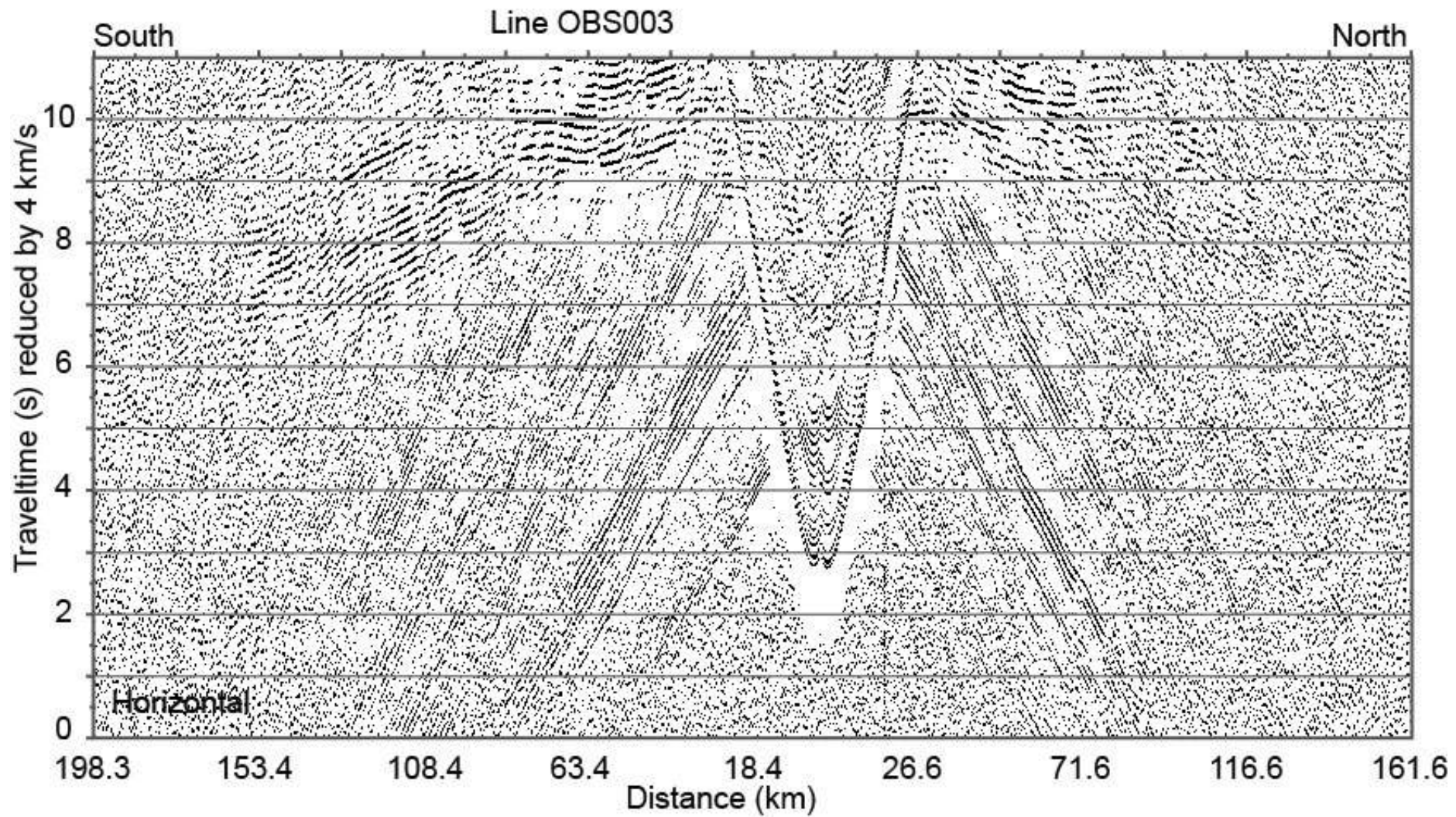


Science opportunities recognized in MCS data at sea:

- Change in basement character at the Blake Spur Magnetic Anomaly – insights on early spreading history?
- Anomalously thick oceanic crust with deep reflectivity beneath Blake Spur Magnetic Anomaly
- Complex patterns in BSR, faulting and other features in Cape Fear area
- Salt diapirism and associated sediment deformation and slope stability
- Intriguing faults and blocks inside and outside of the Currituck slide; a strong BSR is also imaged in this region.
- An intriguing, very thick sediment section with highly variable seismic characteristics is observed in all data
- Seismic Oceanography in area of Gulf Stream

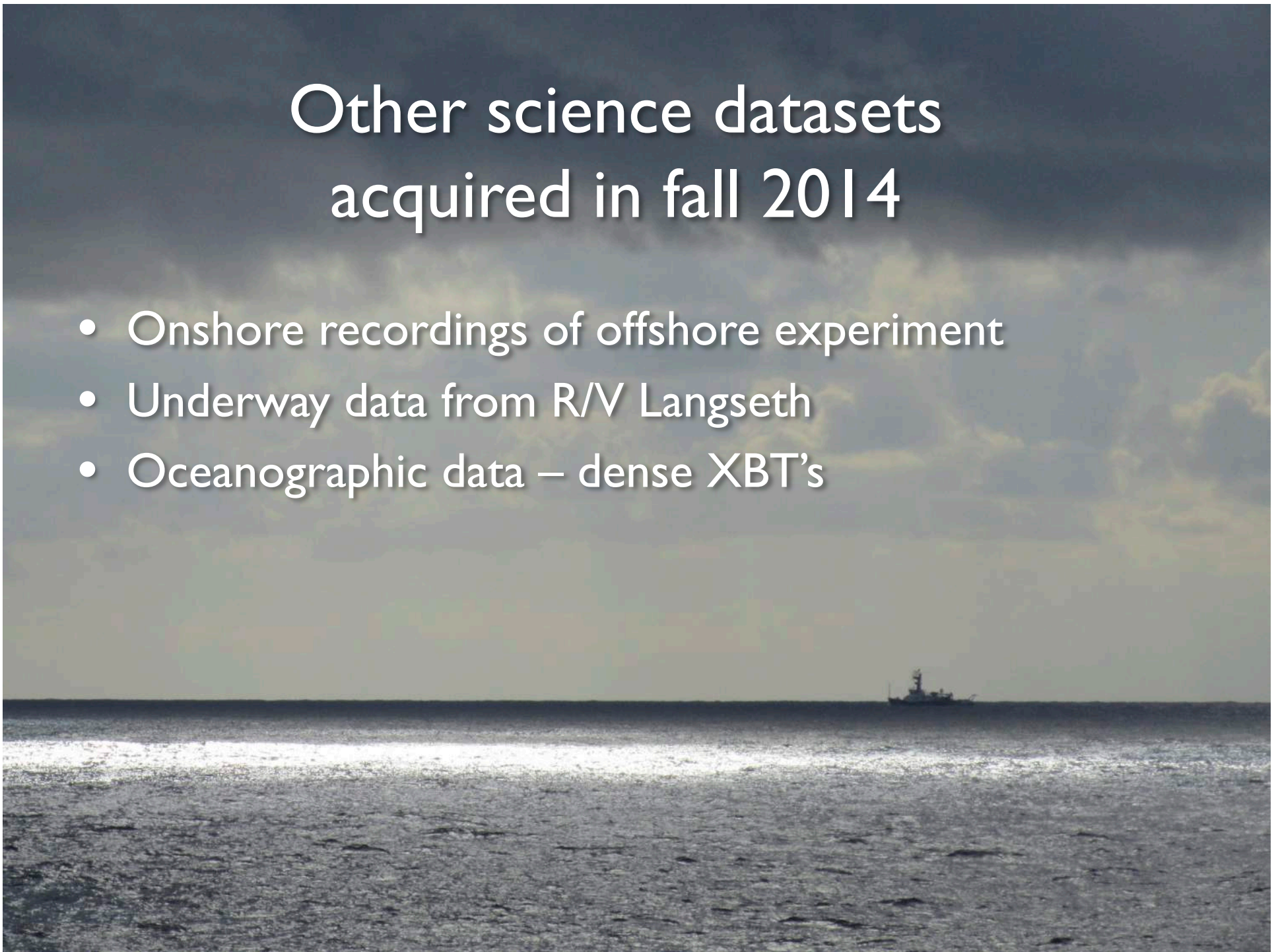


OBS 312

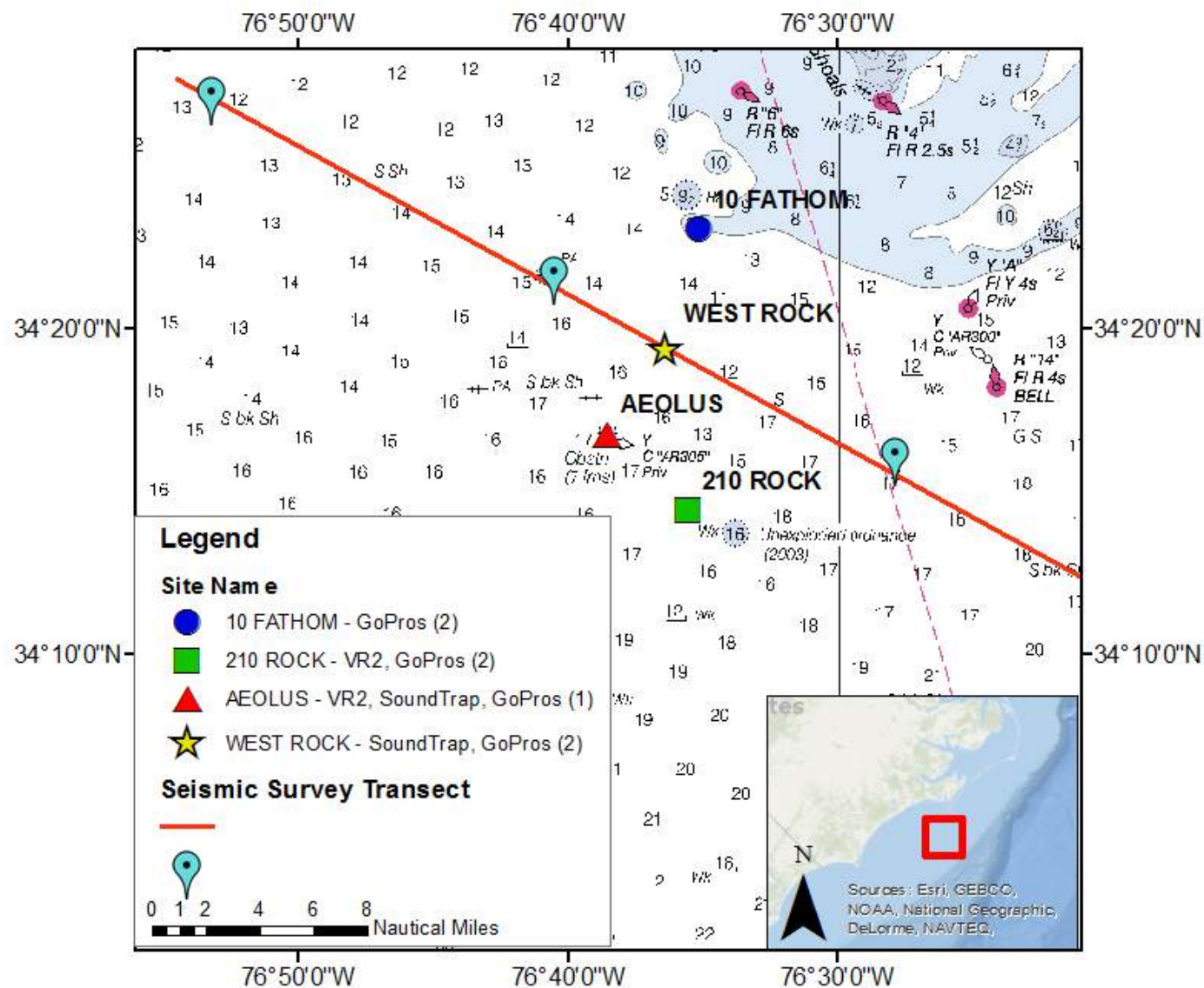


Other science datasets acquired in fall 2014

- Onshore recordings of offshore experiment
- Underway data from R/V Langseth
- Oceanographic data – dense XBT's



Independent study by Duke and NOAA of marine mammals and seismic work



What's next

- Finish uploading all existing ENAM data and send out email blast about its availability
- Finish acquisition
 - recover broadband OBS and onshore instruments in April/May 2015
 - onshore active source program in summer 2015
- Training and science workshops in May/June 2015
- Proposals to NSF and lots of science with the data

Want to see more?

- T53A-4683: ENAM: A community seismic experiment targeting rifting processes and post-rift evolution of the Mid Atlantic US Margin. Van Avendonk et al
- OS43B-1277: Seismic Images of the Gulf Stream Front off the Coast of North Carolina from the 2014 ENAM Community Seismic Experiment

Thank you...

- Support from NSF GeoPRISMS Program
- Captains, Scientific Staffs and Crews of the R/V *Langseth*, R/V *Endeavor*
- Scripps and WHOI OBS groups
- LDEO Marine Office and NSF for planning/permitting efforts
- People in NC and VA for hosting seismic stations

