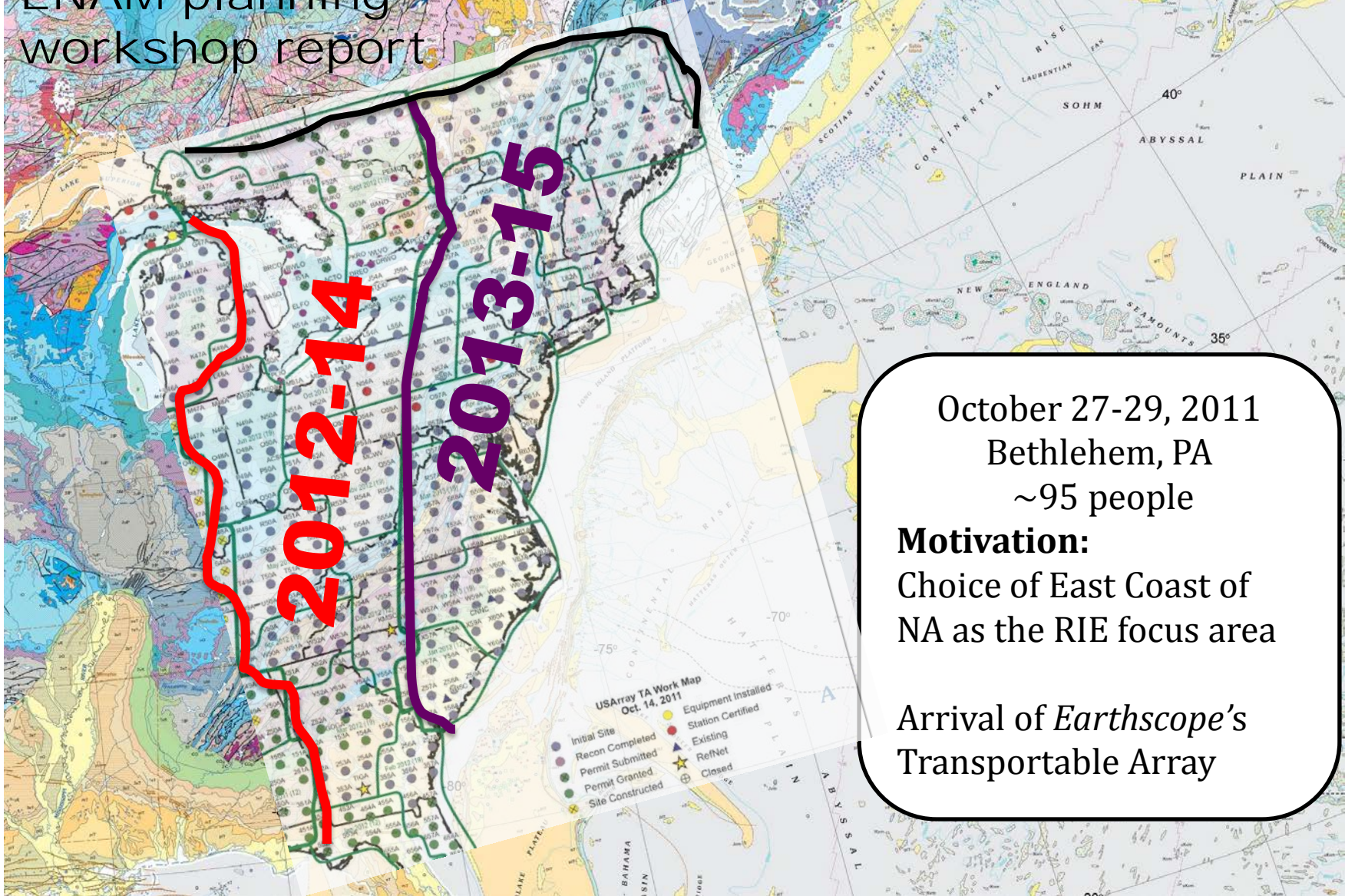


Earthscope-GeoPRISMS ENAM planning workshop report



October 27-29, 2011
Bethlehem, PA
~95 people

Motivation:
Choice of East Coast of
NA as the RIE focus area

Arrival of *Earthscope's*
Transportable Array

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2013

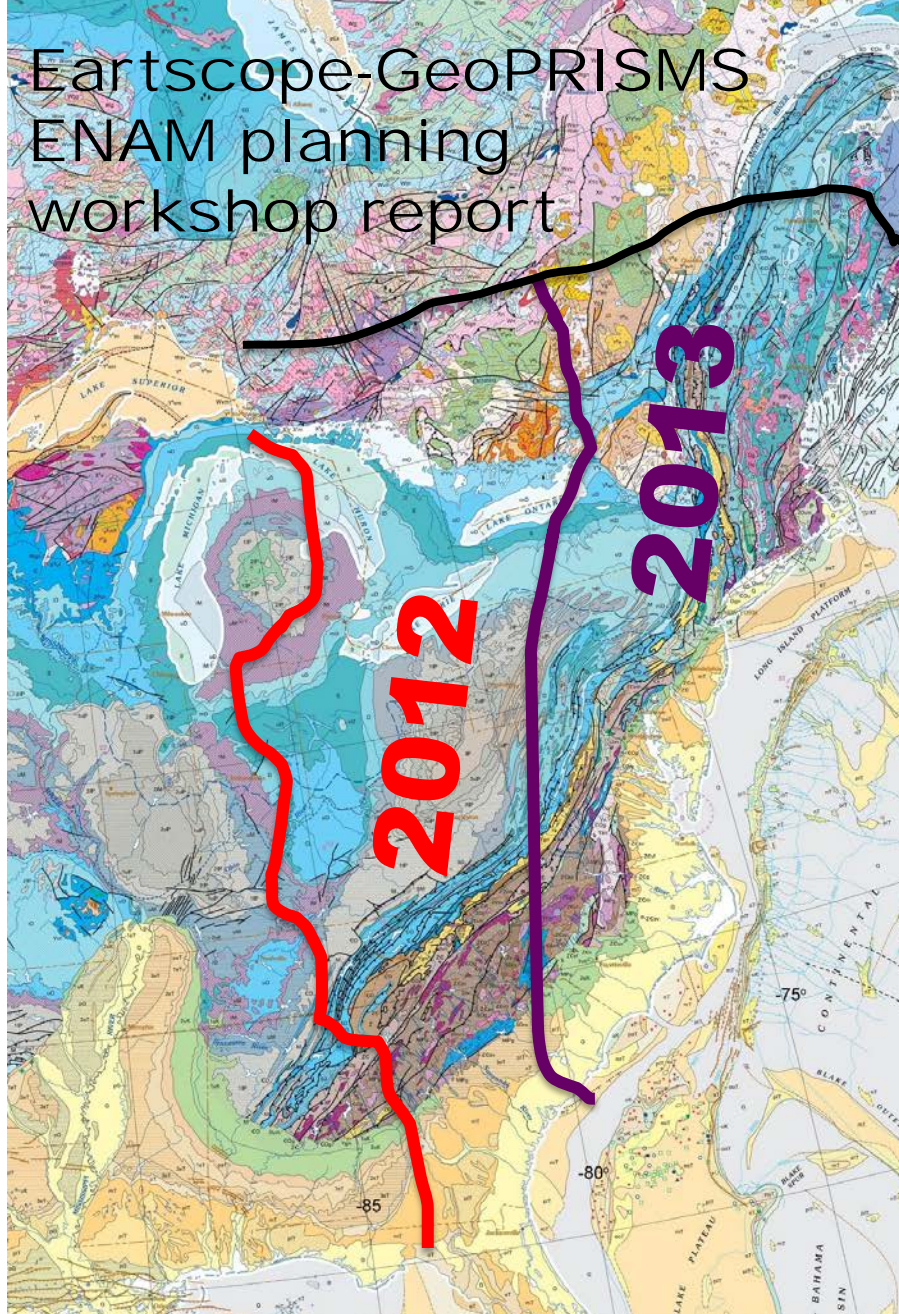
2012

Key goals:

focus community effort and research approaches in the eastern United States

establish research strategies that maximize *EarthScope* and *GeoPRISMS* synergies to address common research goals

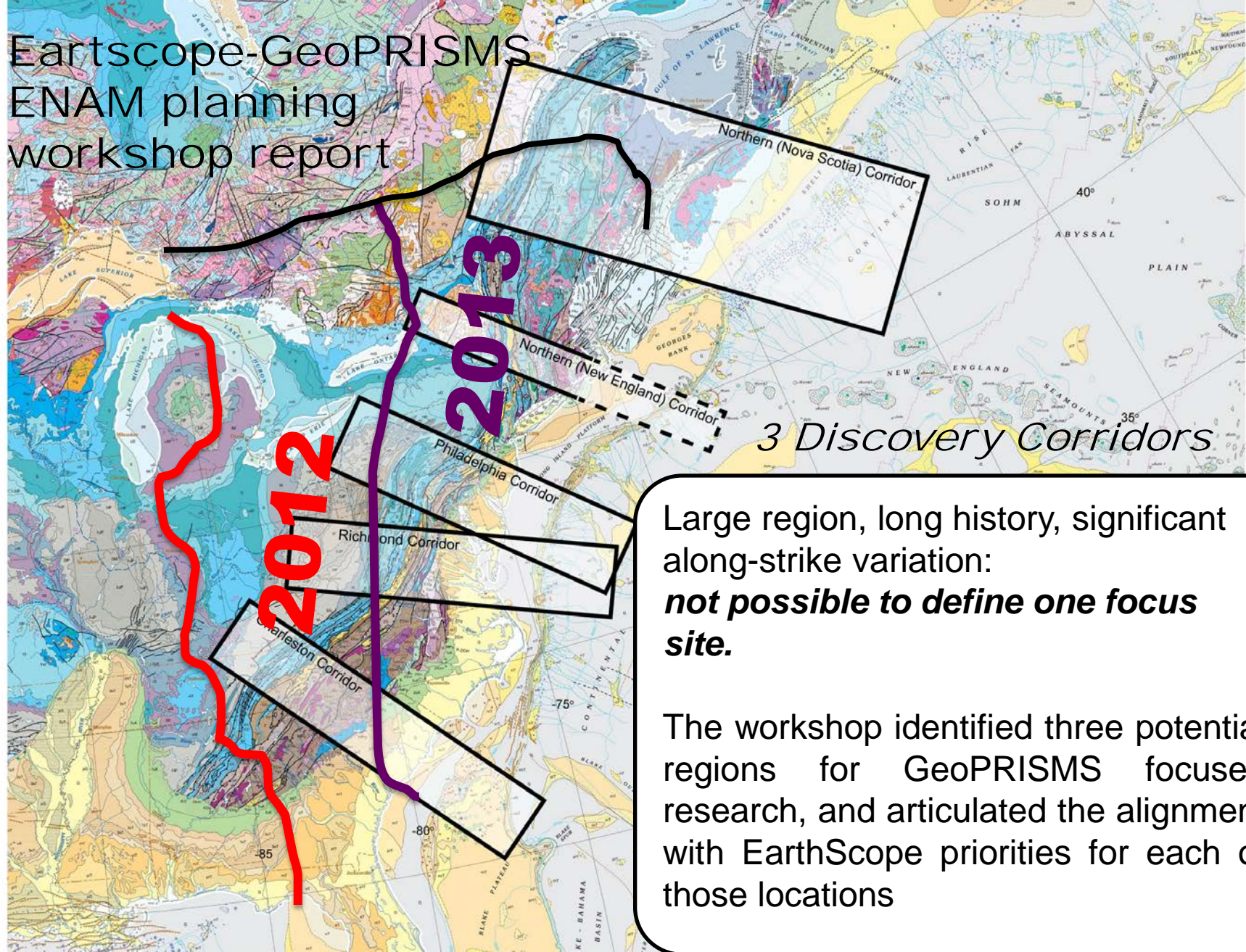
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Key Science Questions

- **Orogenic Processes**
 - ✓ Inheritance of structures
 - ✓ Expression of surface features at depth
 - ✓ How was ENAM lithosphere formed?
 - ✓ State of lithosphere before most recent (Mz) rifting
- **Rifting Processes**
 - ✓ Controls on magmatic vs. a-magmatic
 - ✓ Origin of magma (CAMP)
 - ✓ Mechanism/age of rift initiation
- **Post-rifting Processes**
 - ✓ Timing and origin of first ocean crust
 - ✓ Nature of the COB at various levels?
 - ✓ Post-rift tectonics: subsidence history, causes/consequences of margin segmentations, small volume post-rift magmatism, fault reactivation
- **Neotectonics**
 - ✓ Distribution and location of seismicity
 - ✓ Why does topography persist today?
 - ✓ How do active mantle processes affect surface processes – dynamic topography?
 - ✓ Processes that link structural, topographic, and seismic characteristics?
 - ✓ Submarine slope failures – deep seated or shallow, large or small, correlations to climate, impact on methane storage

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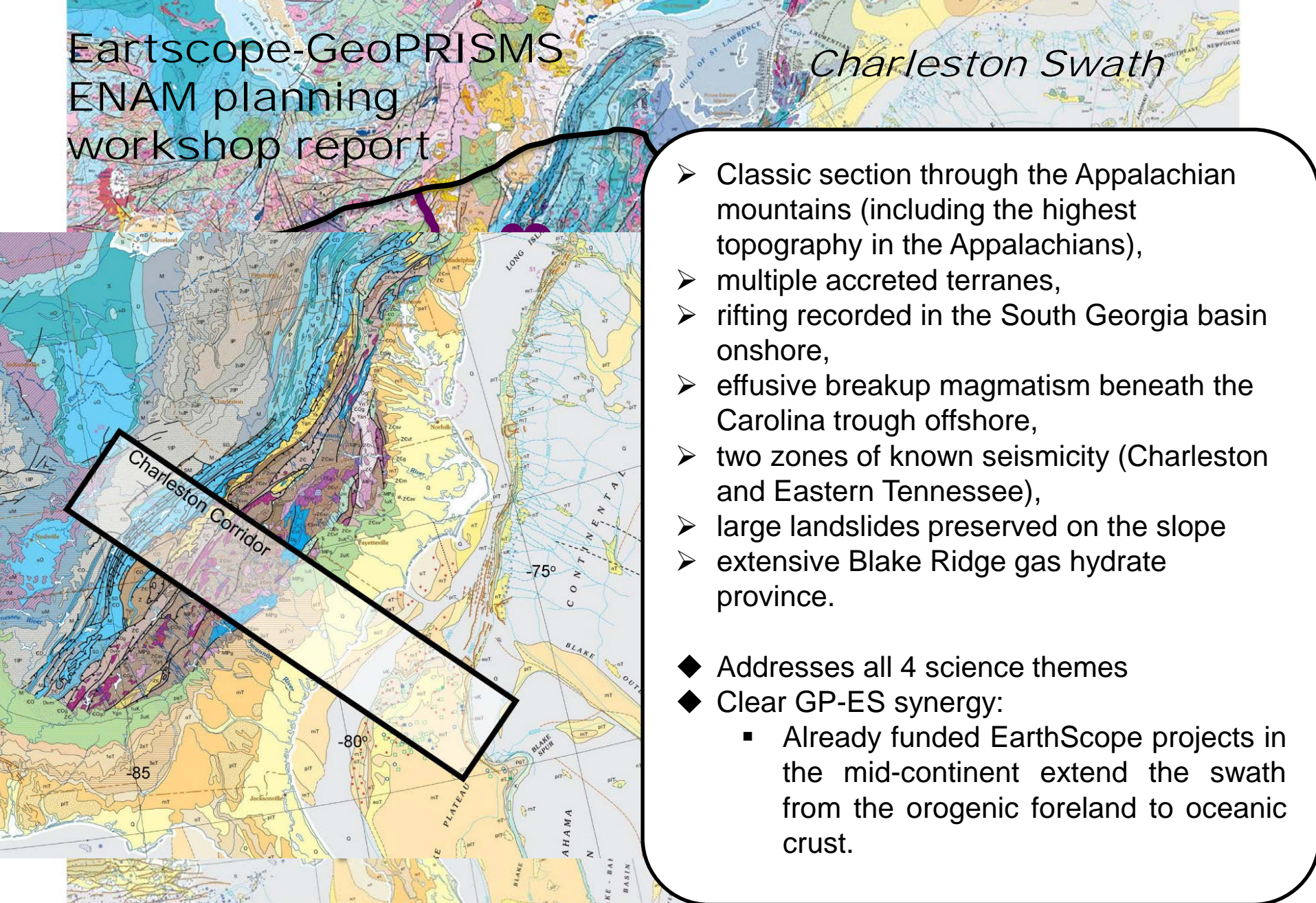


Large region, long history, significant along-strike variation:
not possible to define one focus site.

The workshop identified three potential regions for GeoPRISMS focused research, and articulated the alignment with EarthScope priorities for each of those locations

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Charleston Swath



- Classic section through the Appalachian mountains (including the highest topography in the Appalachians),
 - multiple accreted terranes,
 - rifting recorded in the South Georgia basin onshore,
 - effusive breakup magmatism beneath the Carolina trough offshore,
 - two zones of known seismicity (Charleston and Eastern Tennessee),
 - large landslides preserved on the slope
 - extensive Blake Ridge gas hydrate province.
- ◆ Addresses all 4 science themes
 - ◆ Clear GP-ES synergy:
 - Already funded EarthScope projects in the mid-continent extend the swath from the orogenic foreland to oceanic crust.

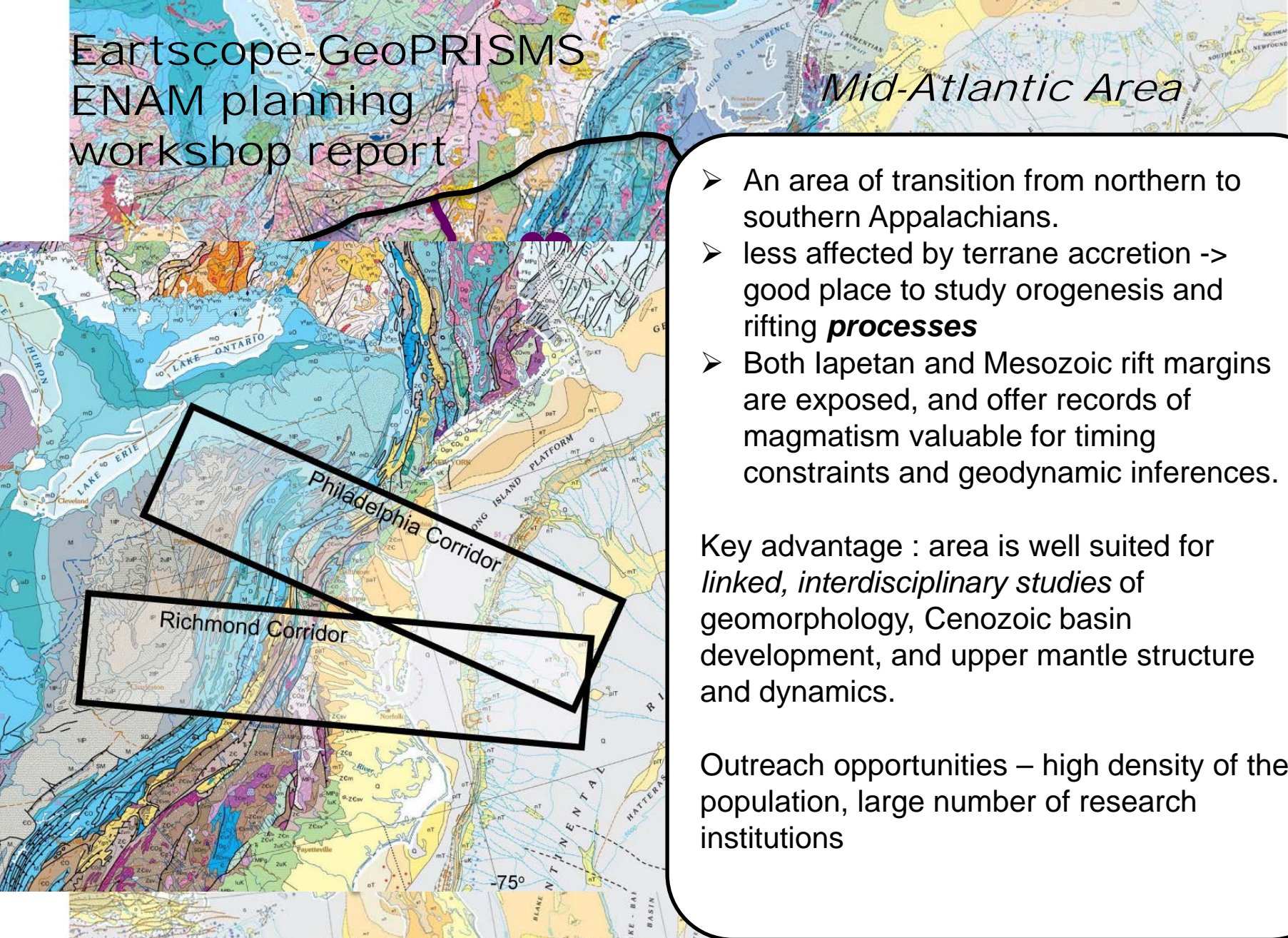
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Mid-Atlantic Area

- An area of transition from northern to southern Appalachians.
- less affected by terrane accretion -> good place to study orogenesis and rifting **processes**
- Both Iapetan and Mesozoic rift margins are exposed, and offer records of magmatism valuable for timing constraints and geodynamic inferences.

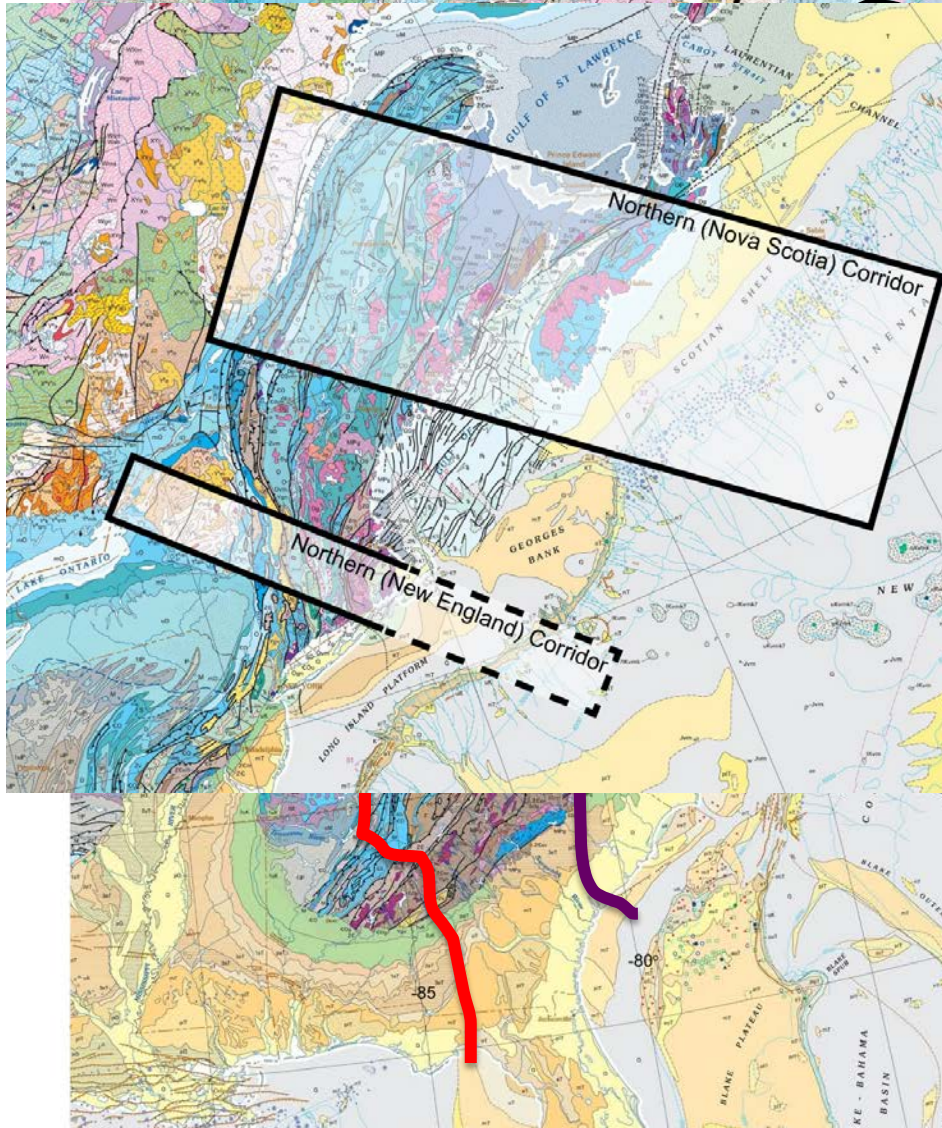
Key advantage : area is well suited for *linked, interdisciplinary studies* of geomorphology, Cenozoic basin development, and upper mantle structure and dynamics.

Outreach opportunities – high density of the population, large number of research institutions



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Nova Scotia & New England



- Area **critical** for understanding magmatism as a fundamental control on the process of rifting
 - magmatic – amagmatic transition in rupture and continental breakup style
- Well-exposed northern Appalachian terranes strike-slip tectonism along terrane boundaries,
- A record of rifting in the Fundy basin
- active seismicity of the Charlevoix region.

Area is Canada:

Good – lots of offshore data

Bad – no TA (yet)

With some extra Canadian resources on land a swath may extend across two orogens, give a view of two “complete” Wilson cycles.

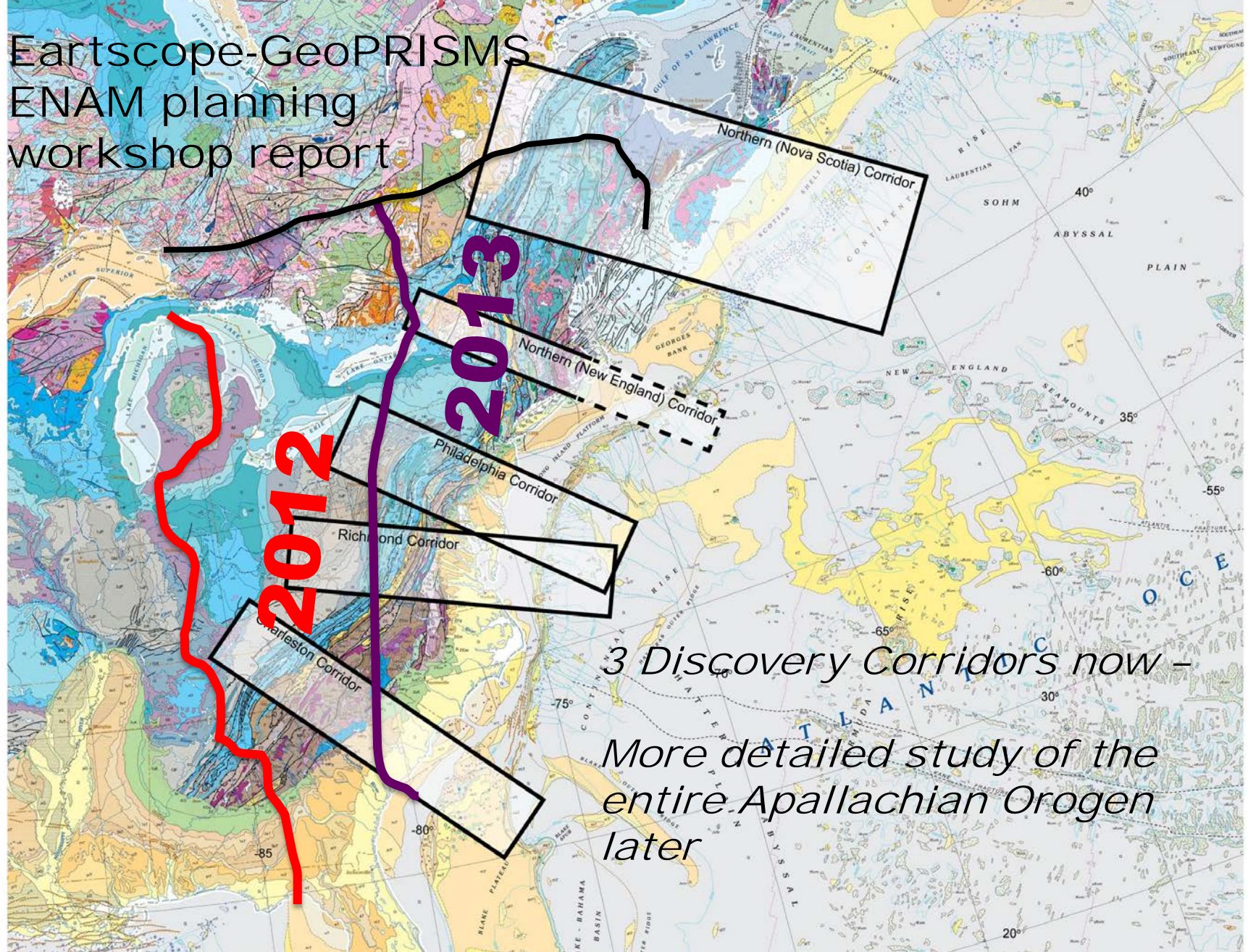
New England -

Pz accreted orogen (Grenville)

Mz Hot Spot track

Syn-rift basin

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3 Discovery Corridors now –
More detailed study of the
entire Appalachian Orogen
later