

Seismic and geophysical studies of western Canada

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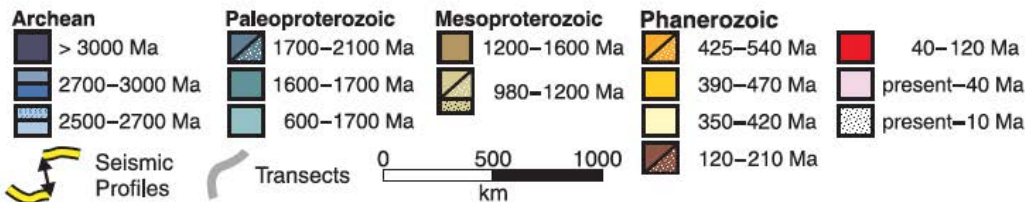
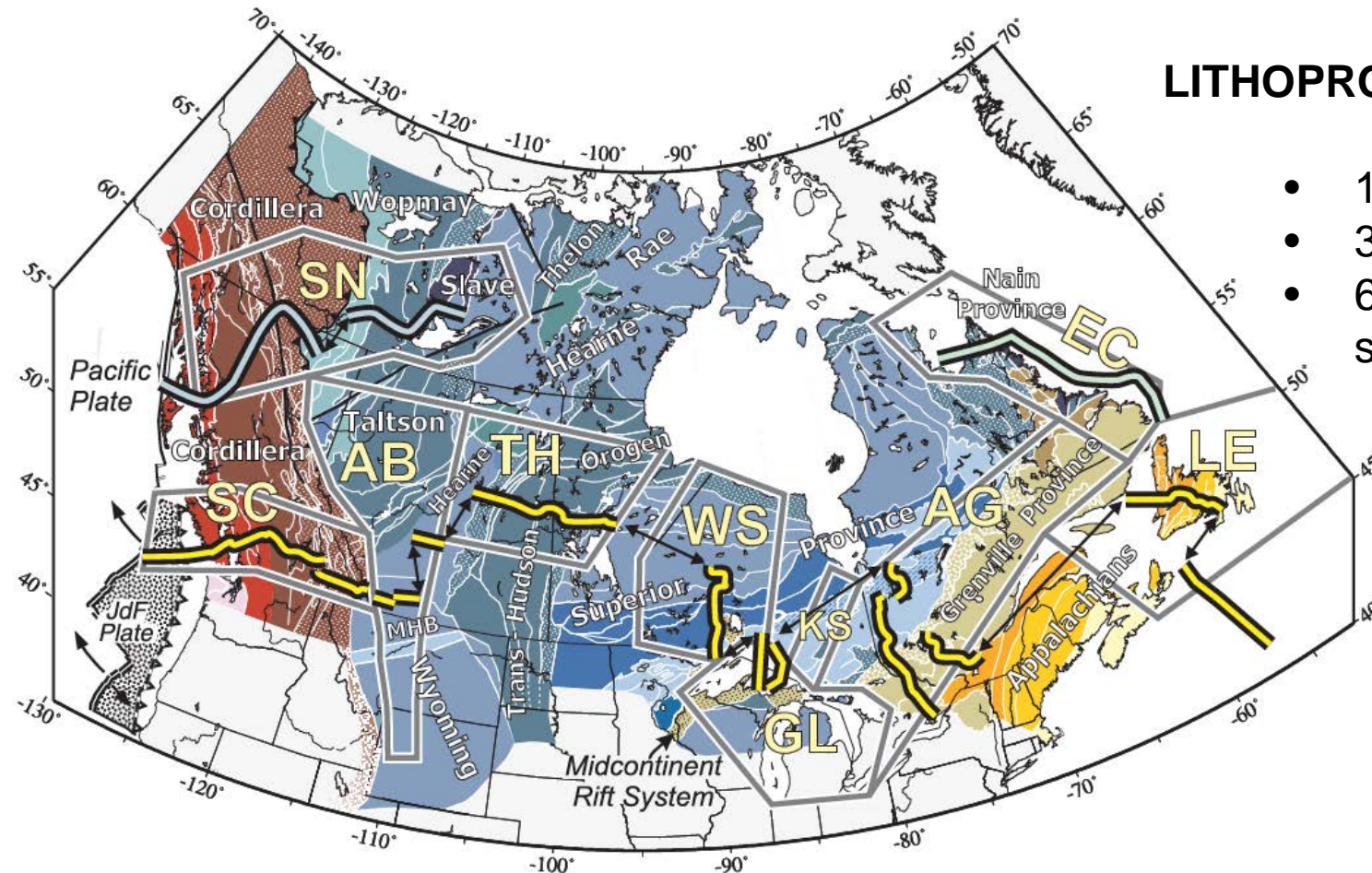
With contributions from and discussions with:

Andrew Schaeffer, David Eaton, Julie Elliott, Lucinda Leonard, Roy Hyndman, Michael Schmidt, Martyn Unsworth, the CCArray team, and many students.
Special thanks to K. Boggs.

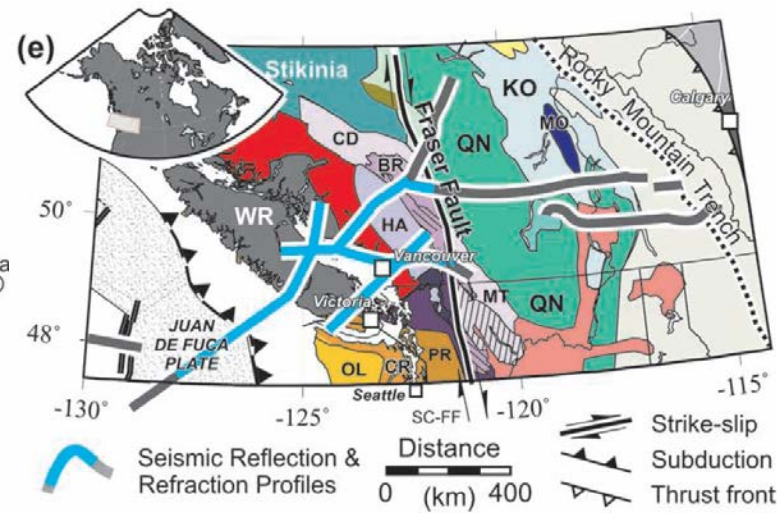
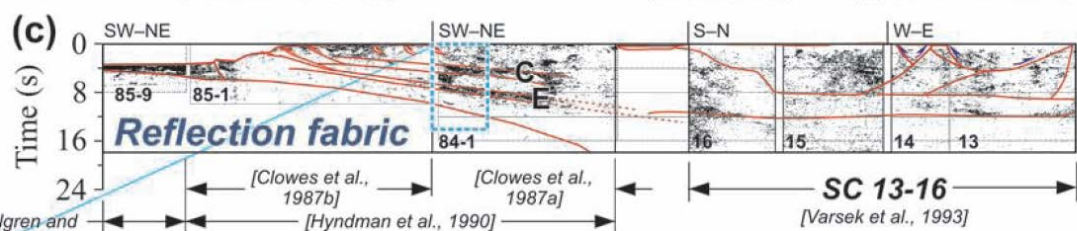
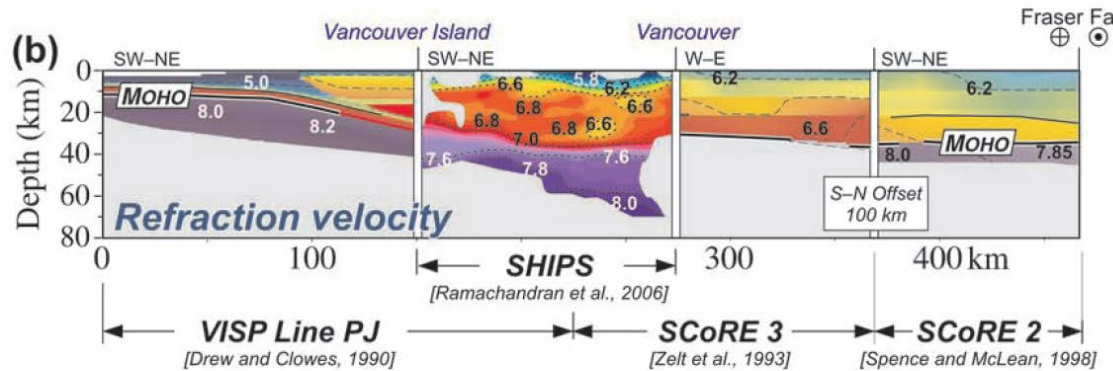
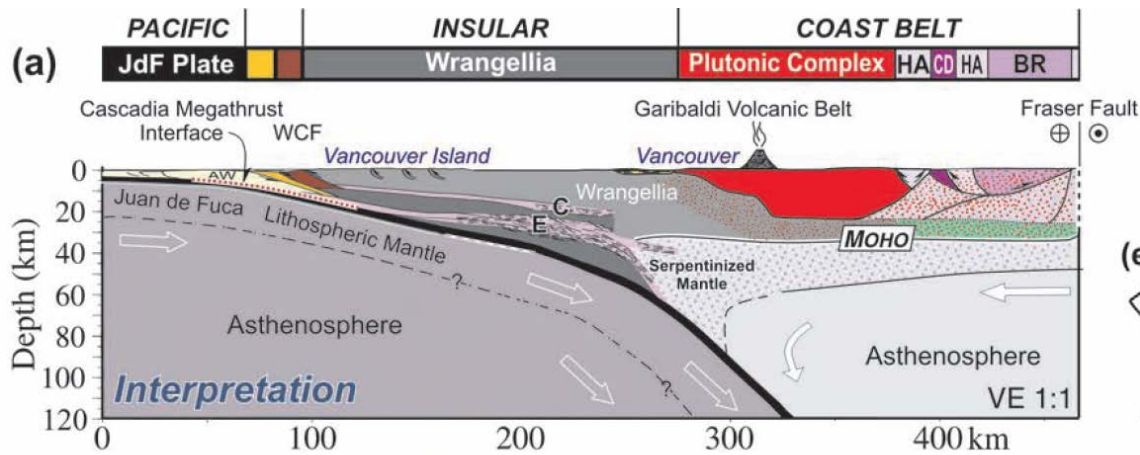
LITHOPROBE Legacy

LITHOPROBE: 1984-2005

- 10 Transects
- 3 Cross sections
- 6000 km long section



LITHOPROBE Legacy

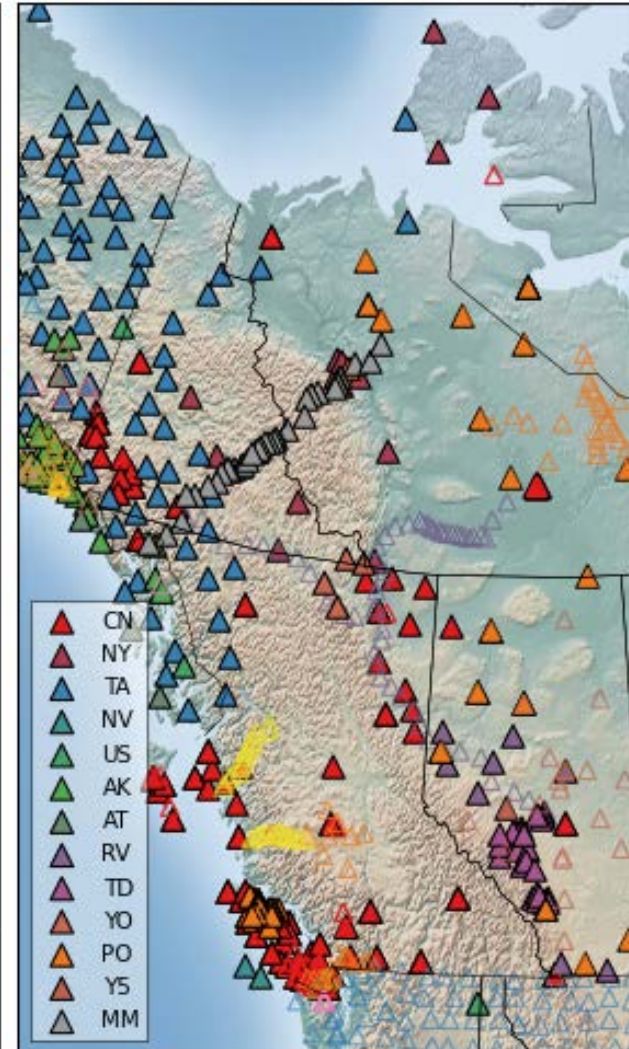
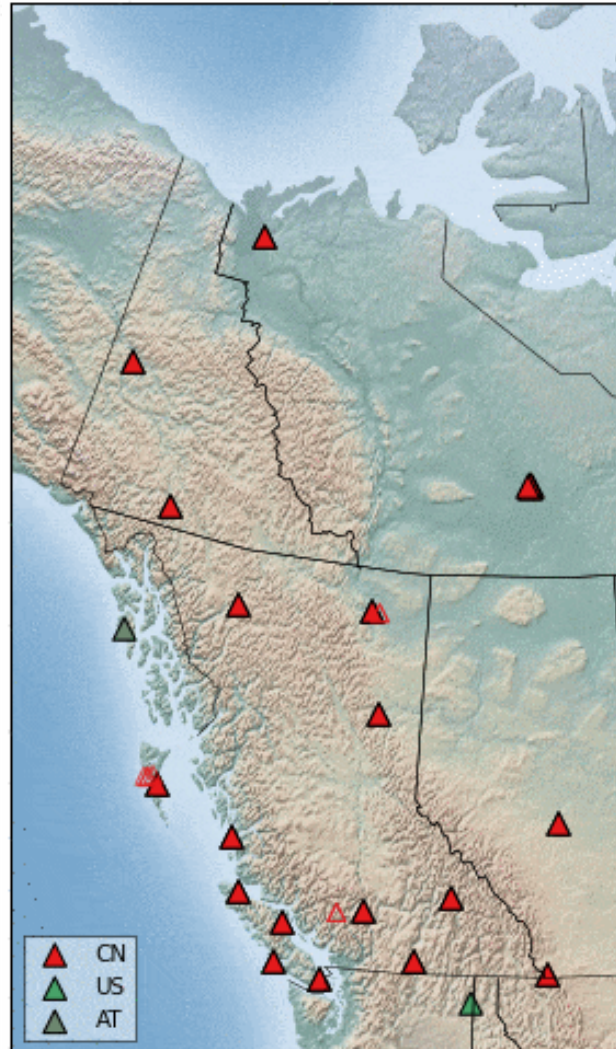


Evolution of BB seismic networks

2000.01

2000.01

2016.11

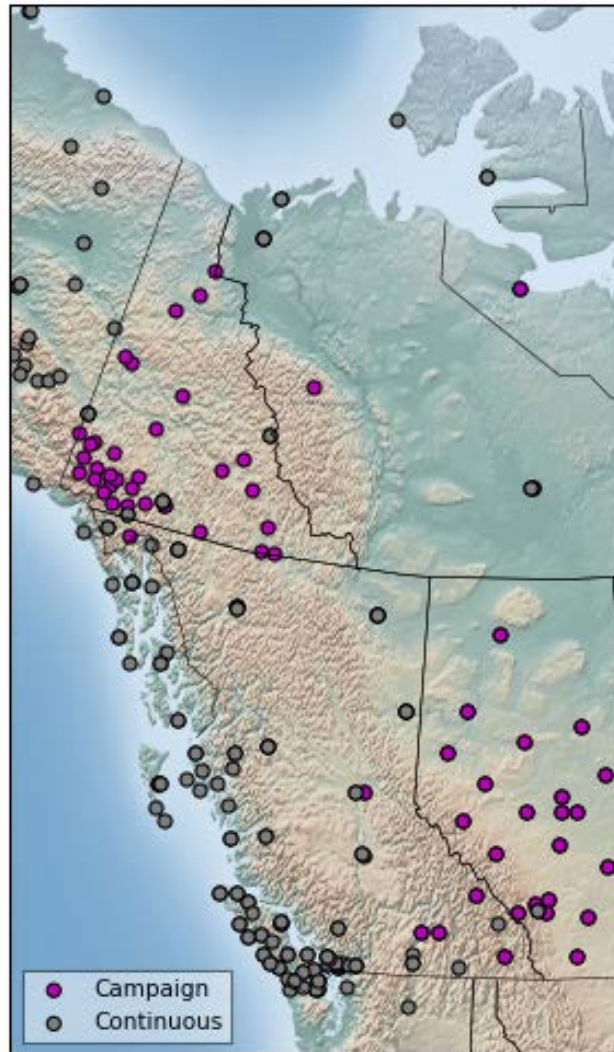
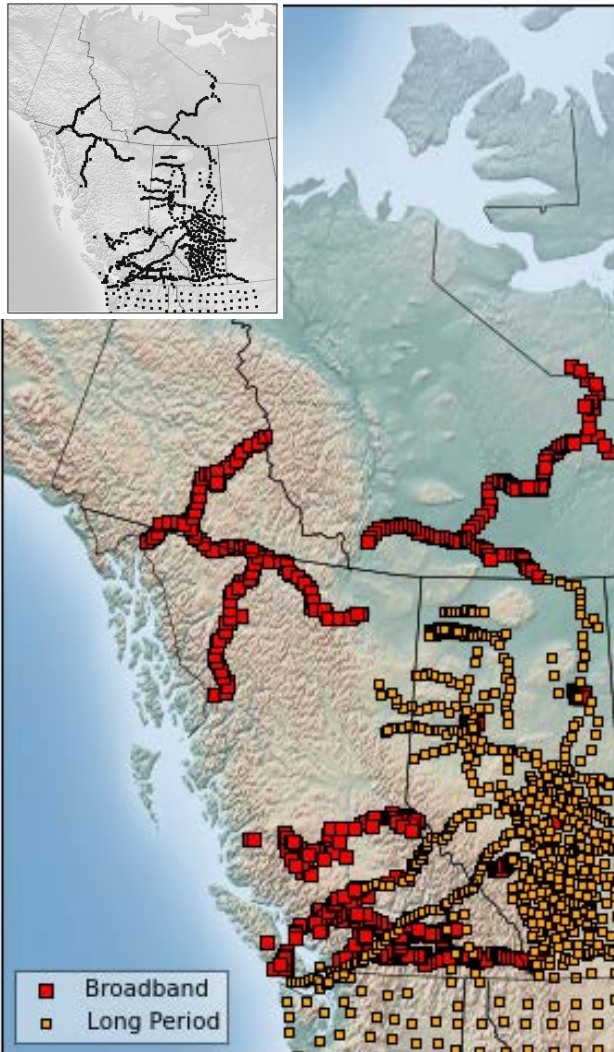


Geophysical networks

Magnetotelluric

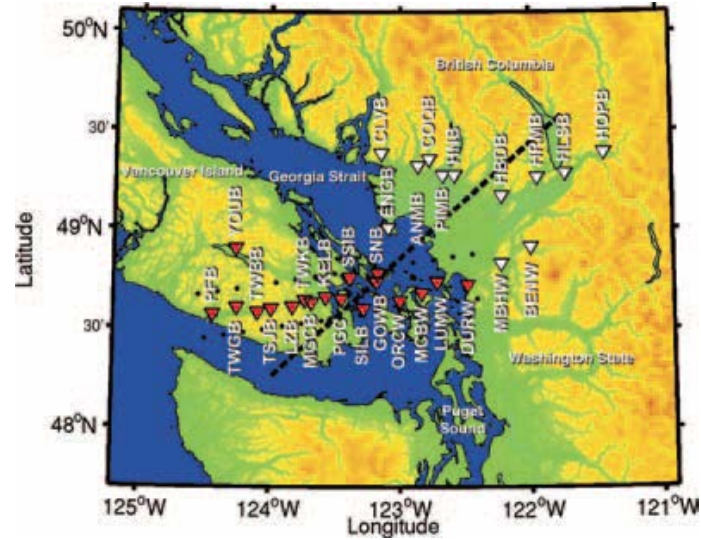
GPS

2016.11

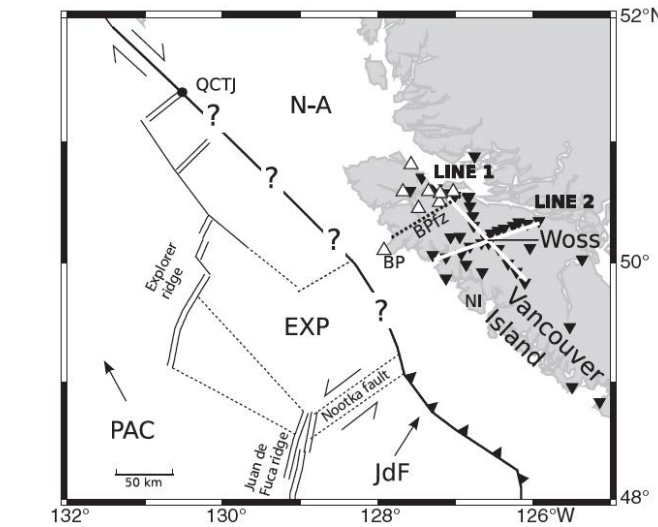


Receiver functions

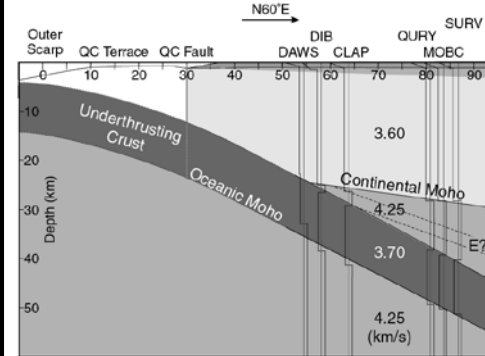
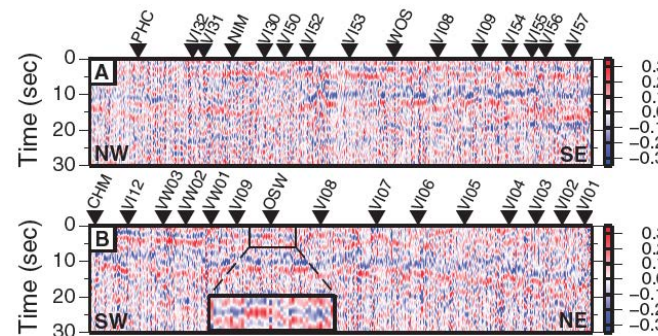
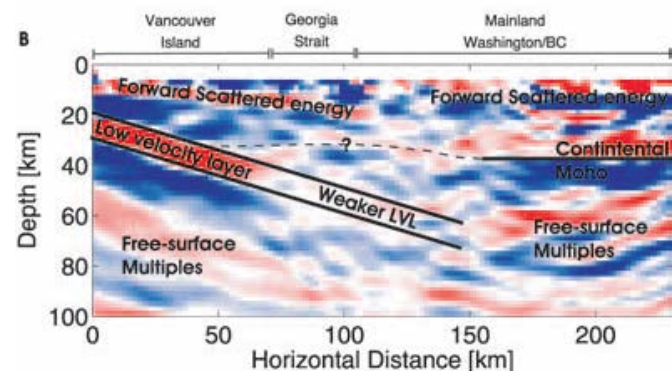
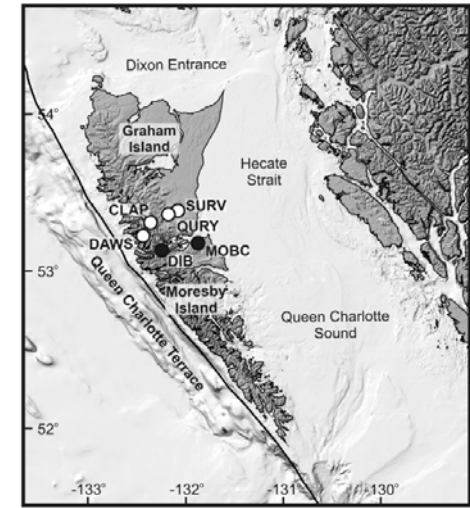
Nicholson et al., EPSL, 2005



Audet et al., Geology, 2008

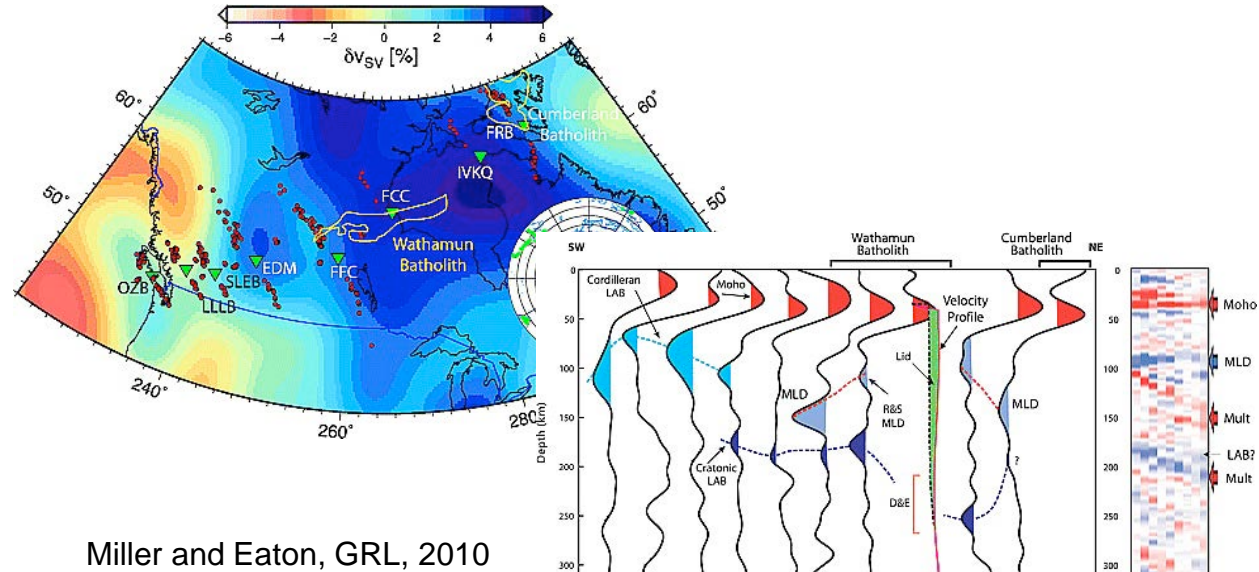
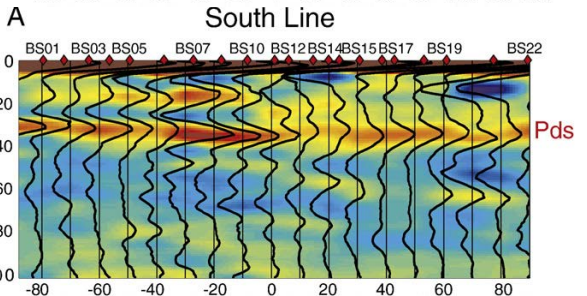
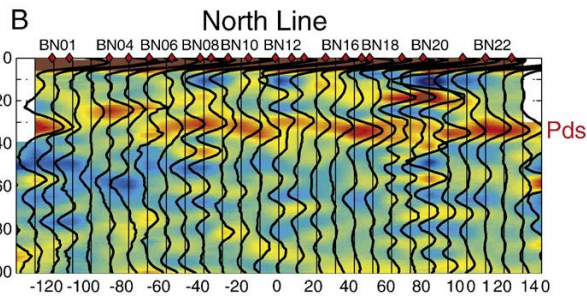
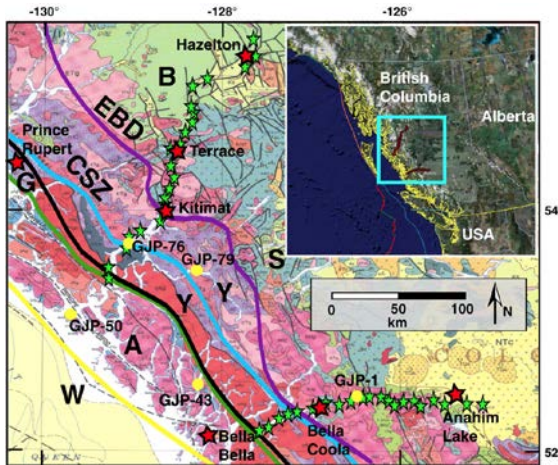


Bustin et al., GJI, 2007

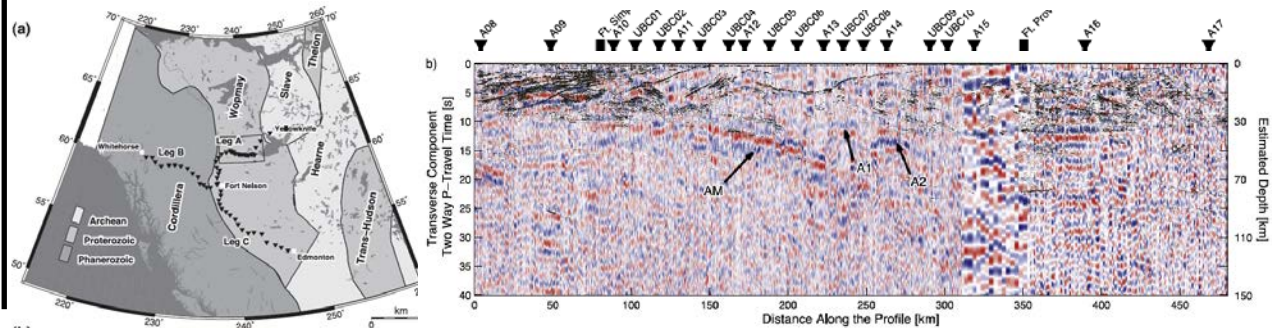


Receiver functions

Calkins et al., EPSL, 2010

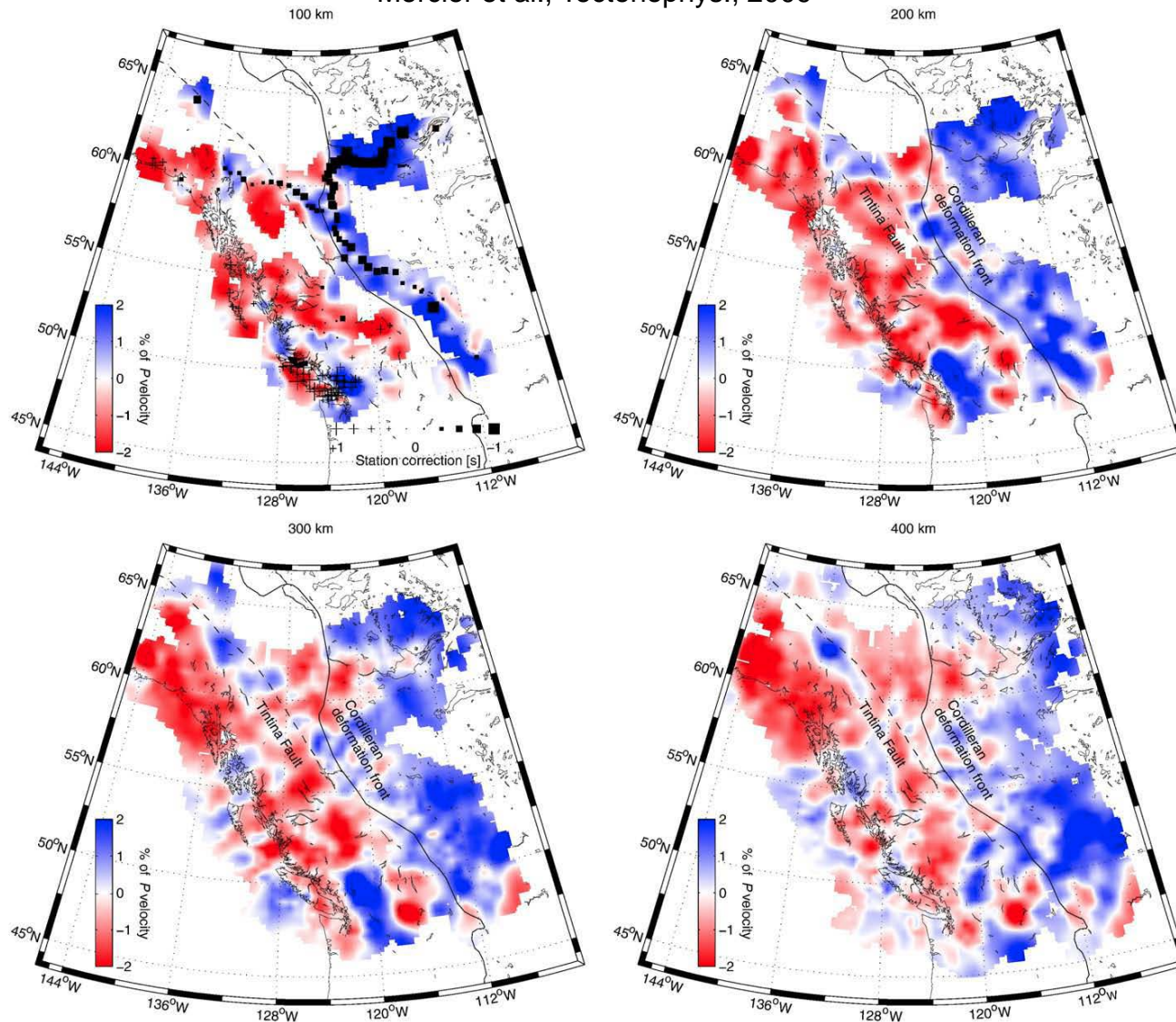


Mercier et al., JGR, 2008



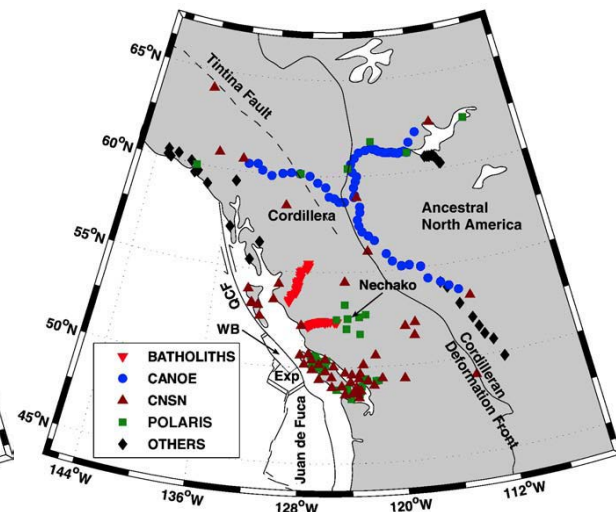
Body-wave velocity model

Mercier et al., Tectonophys., 2009



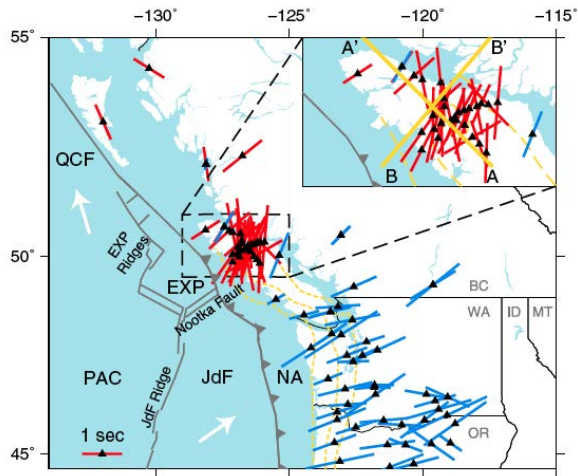
P-wave velocity model

- Upper mantle (100-400 km)
- Slow/hot Cordillera vs Fast/cold Craton
- Cordillera-Craton boundary near RM Trench
- Northern edge of subducting JdF plate

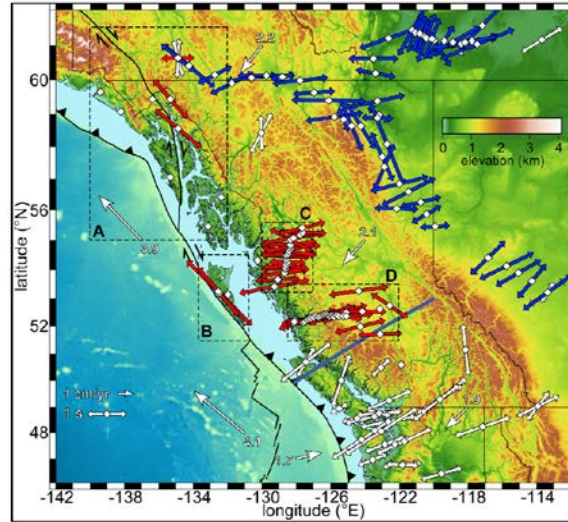


Teleseismic shear-wave splitting

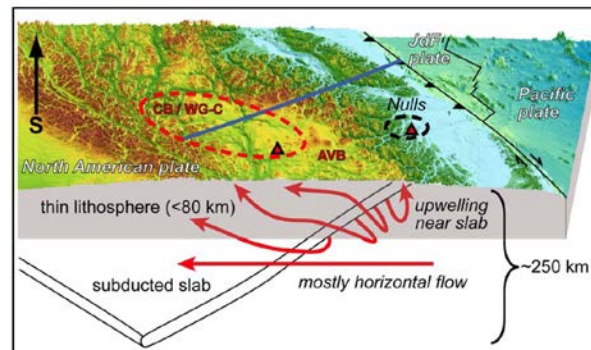
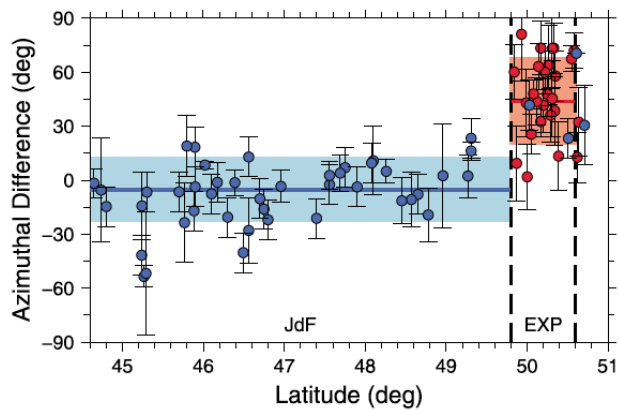
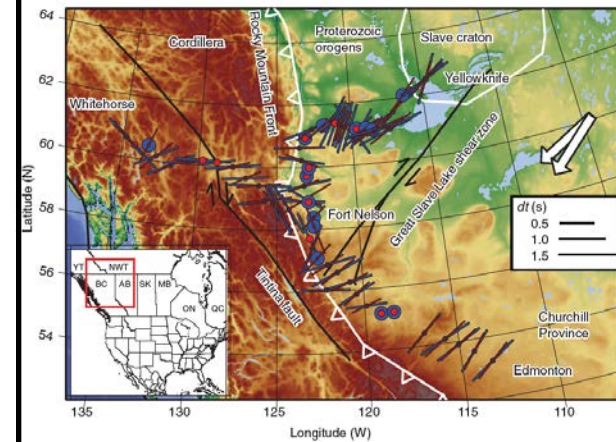
Mosher et al., GRL, 2014



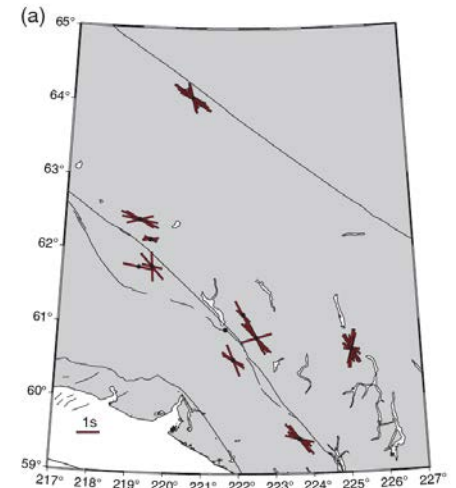
Frassetto, 2008



Courtier et al., Geology 2007

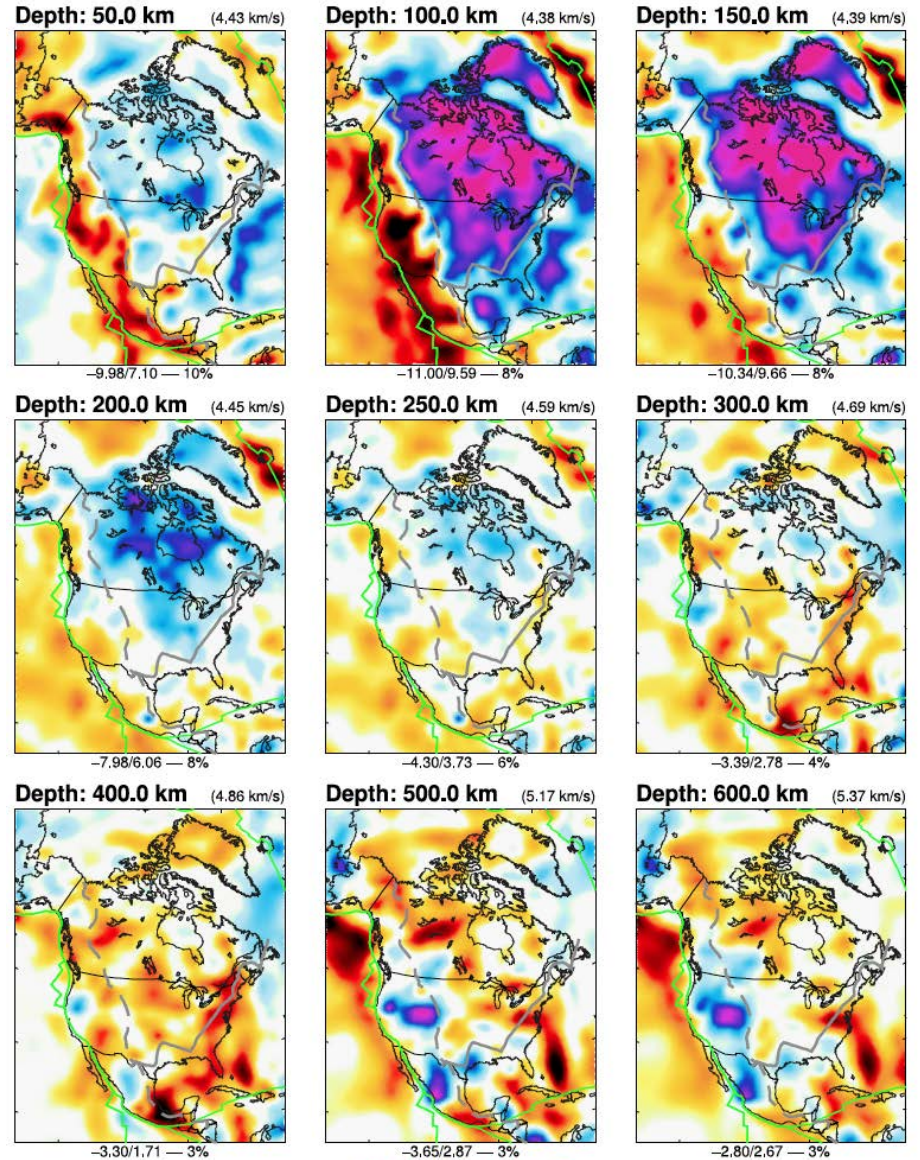
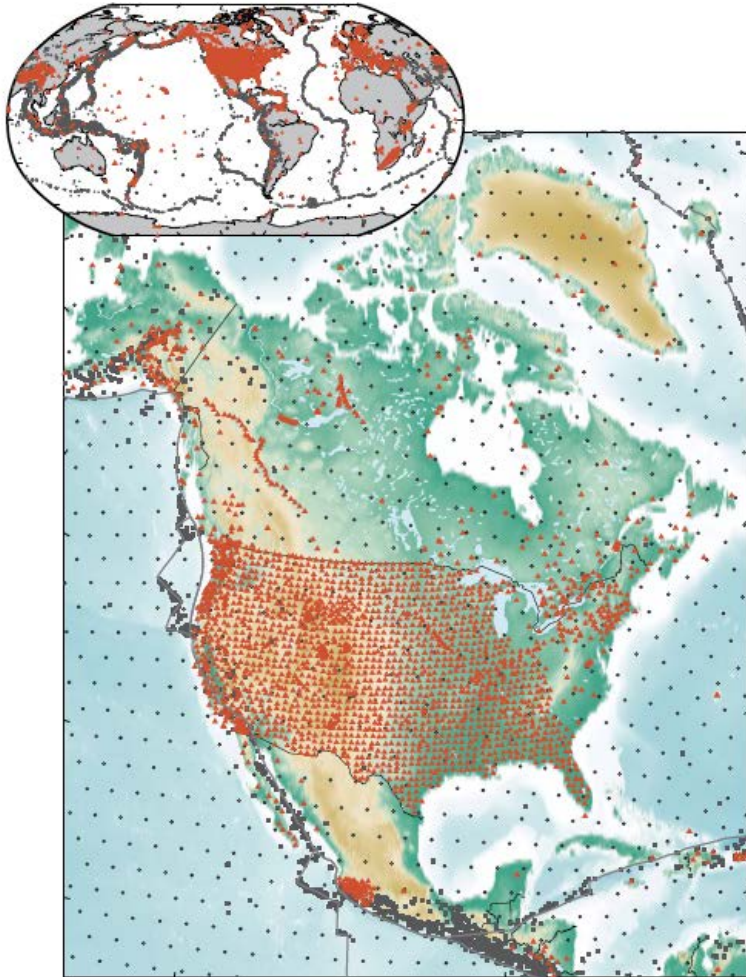


Rasendra et al., BSSA, 2014

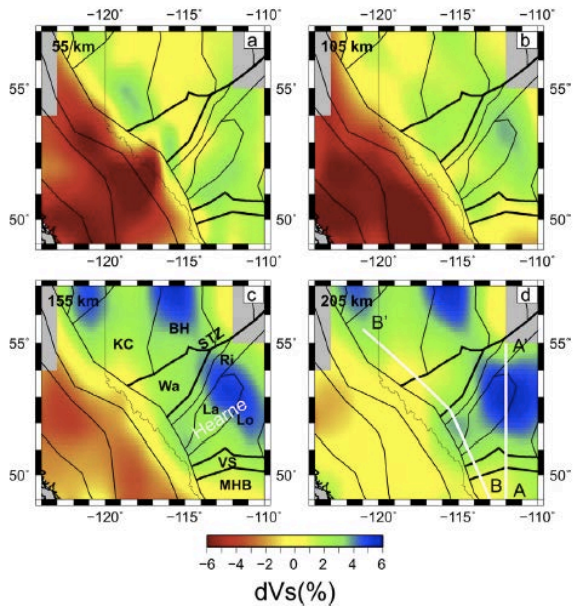


Surface-wave velocity models

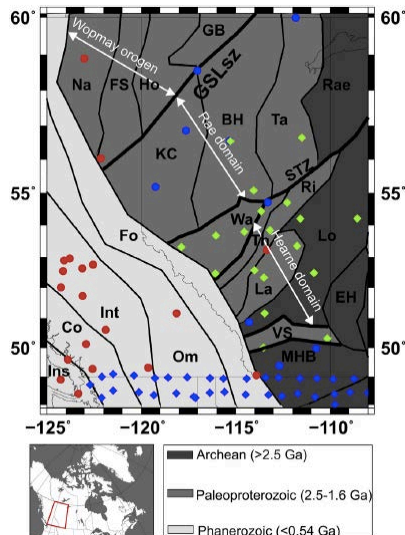
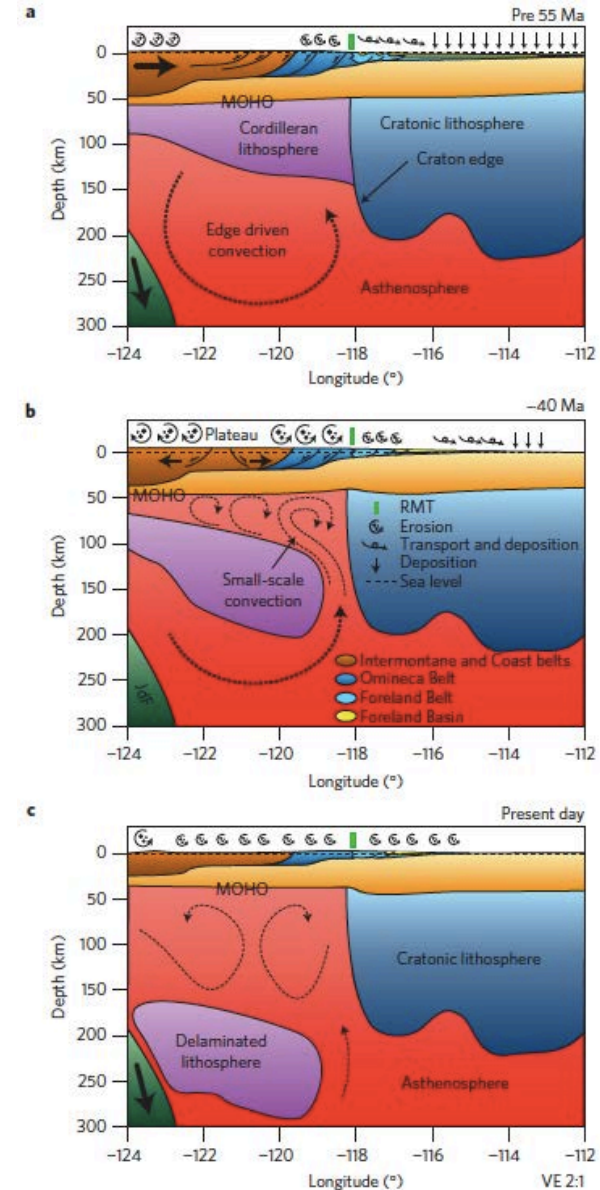
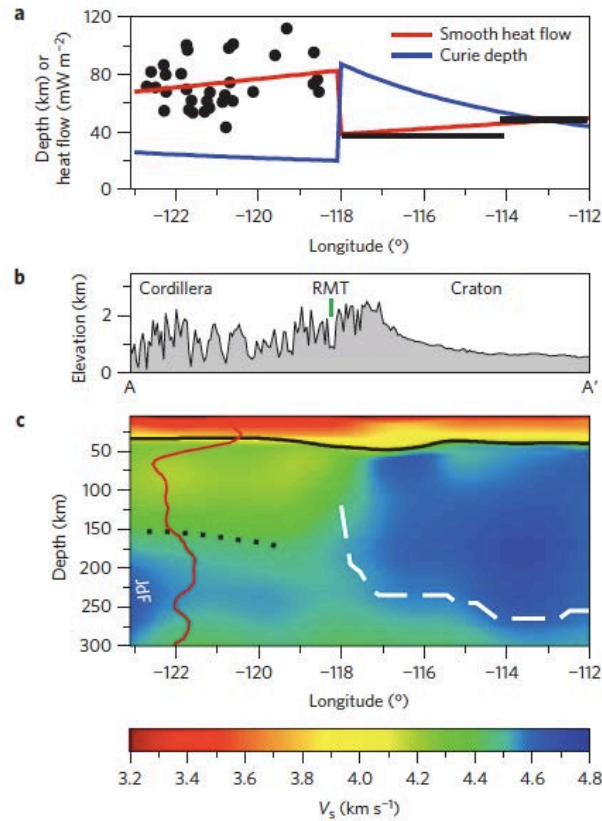
Schaeffer and Lebedev, EPSL, 2014



Surface-wave velocity models

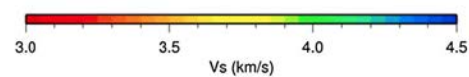
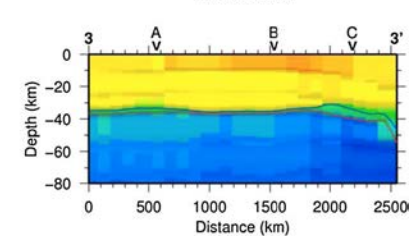
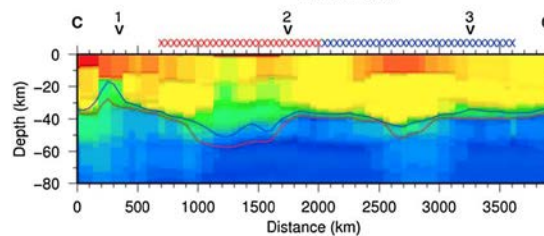
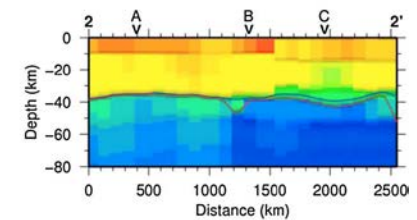
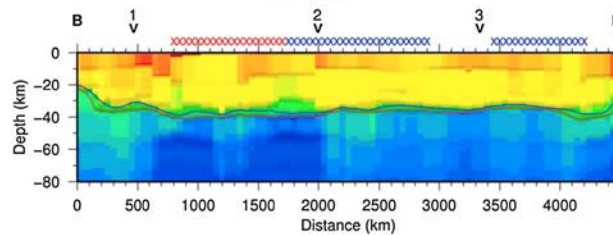
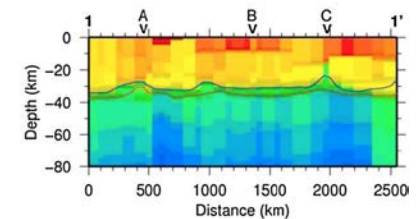
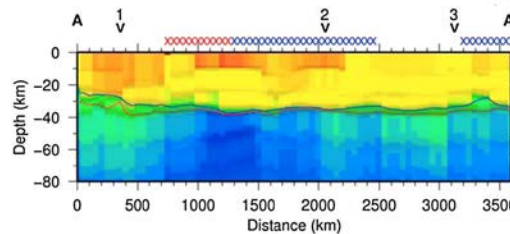
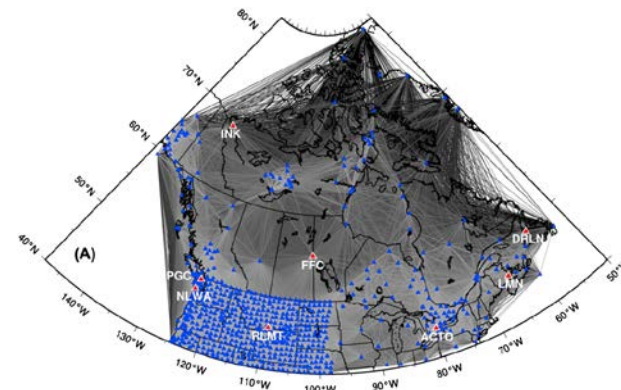
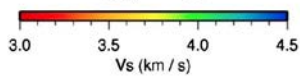
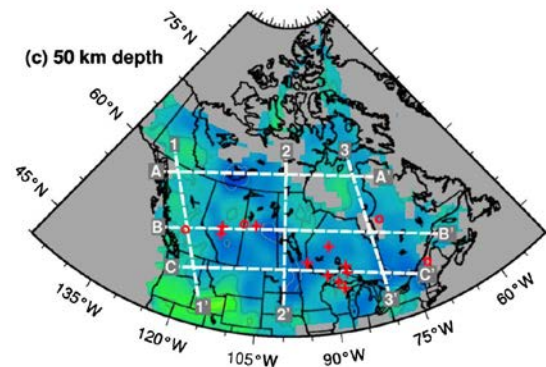
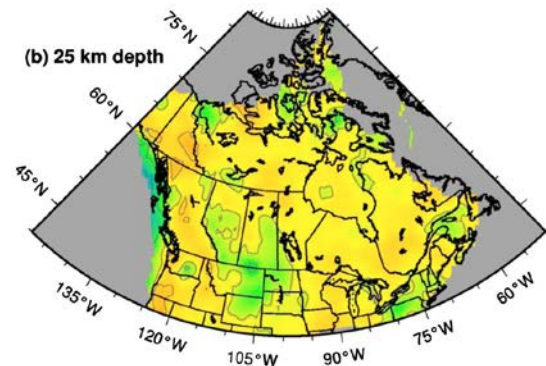
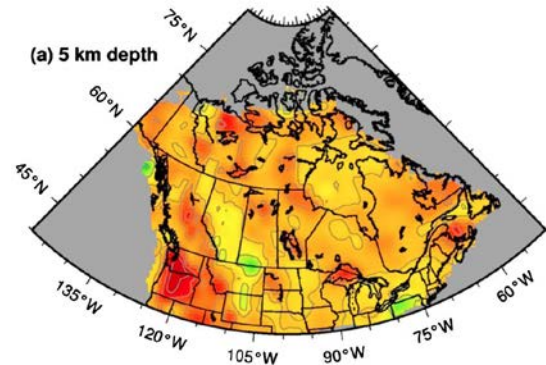


Bao and Eaton, Prec. Res., 2015
 Bao et al., Nat. Geo, 2014



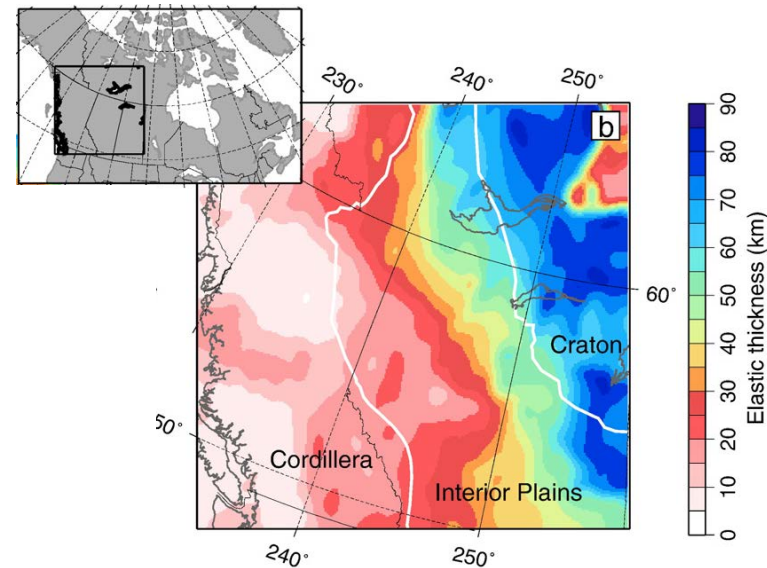
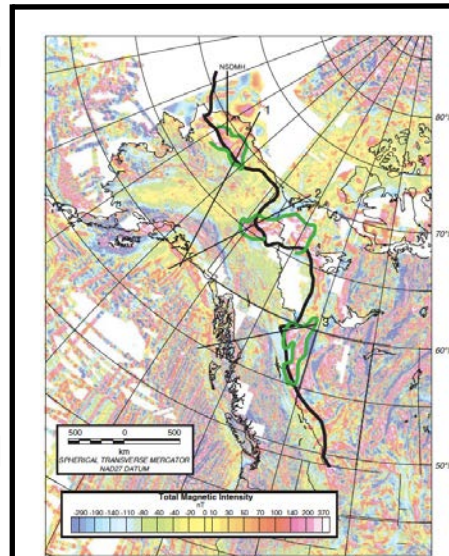
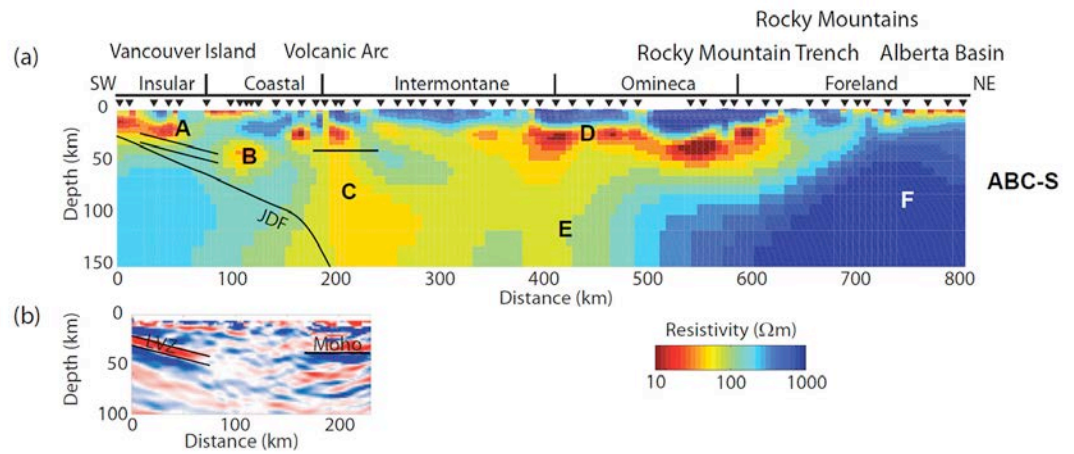
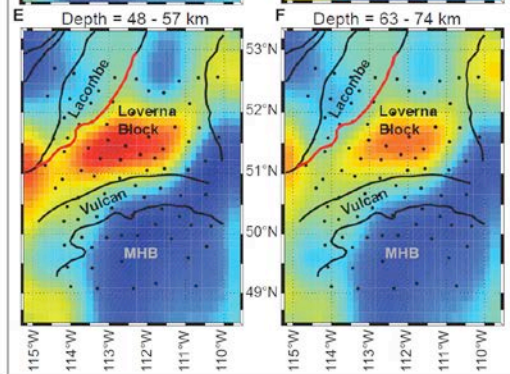
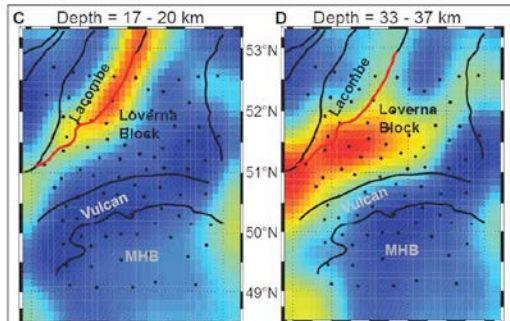
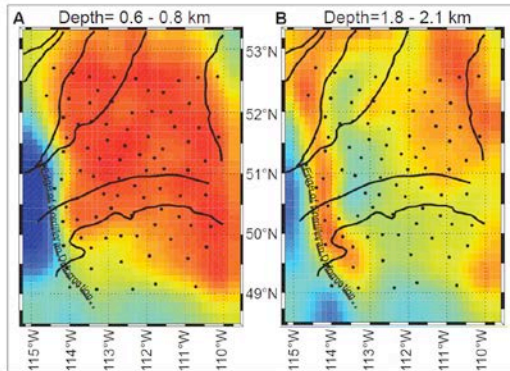
Ambient noise surface-wave model

Kao et al., JGR, 2013



Other geophysical studies

Unsworth, Recorder, 2015

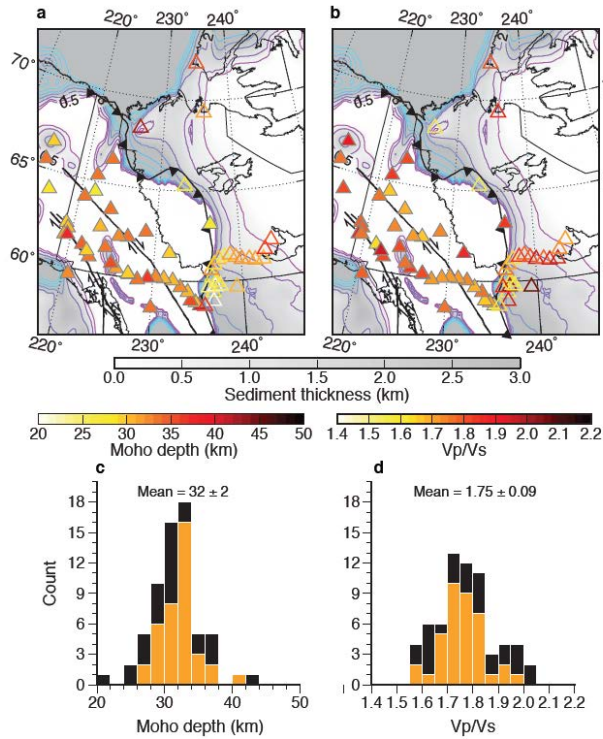


Saltus and Hudson, Geology, 2007

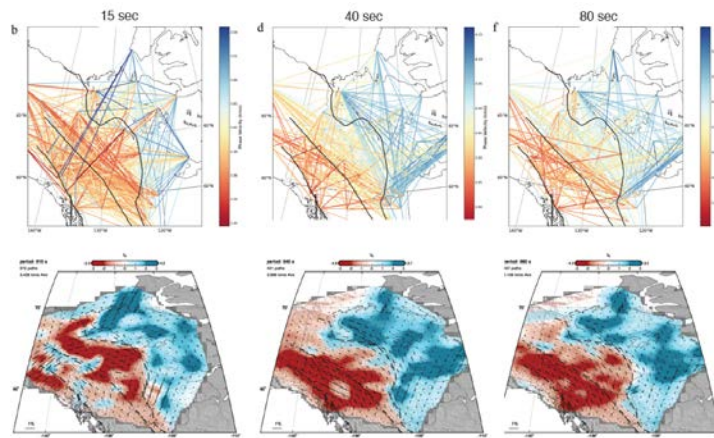
Audet et al., EPSL, 2007

Ongoing work: northern Cordillera

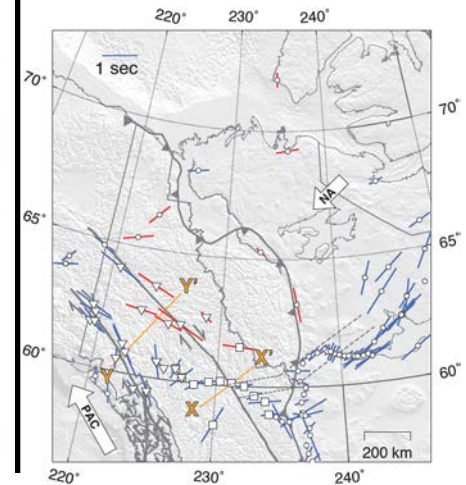
Receiver functions



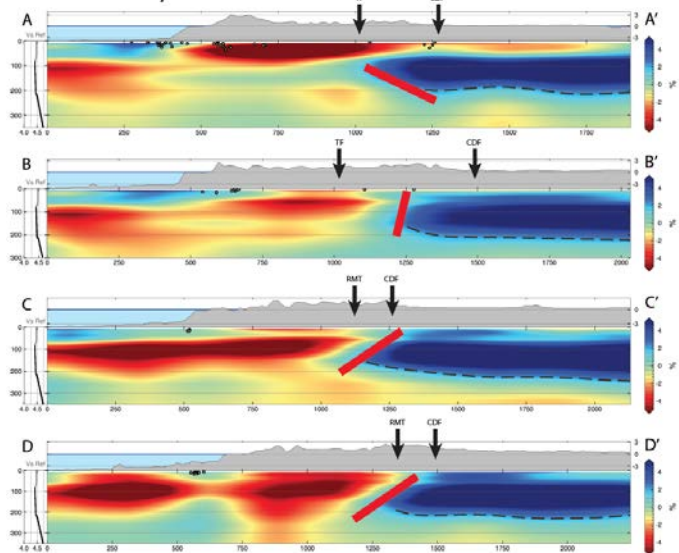
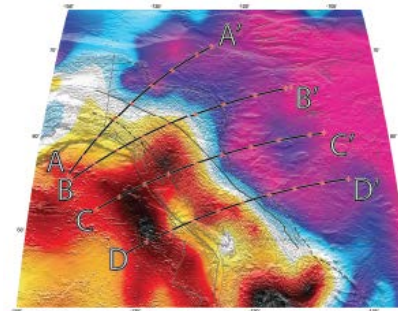
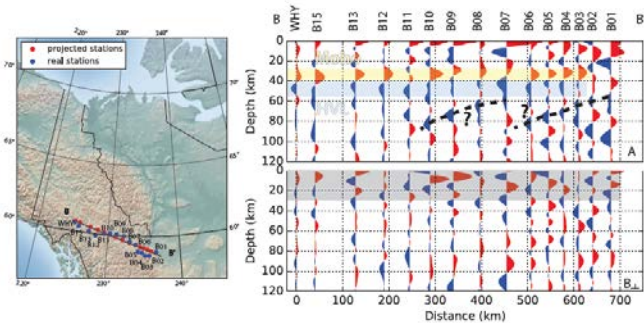
Rayleigh-wave phase velocity maps



SKS splitting



Cordillera-Craton boundary



Contributions from A. Schaeffer, A. Tarayoun, M. McLellan, C. Sole

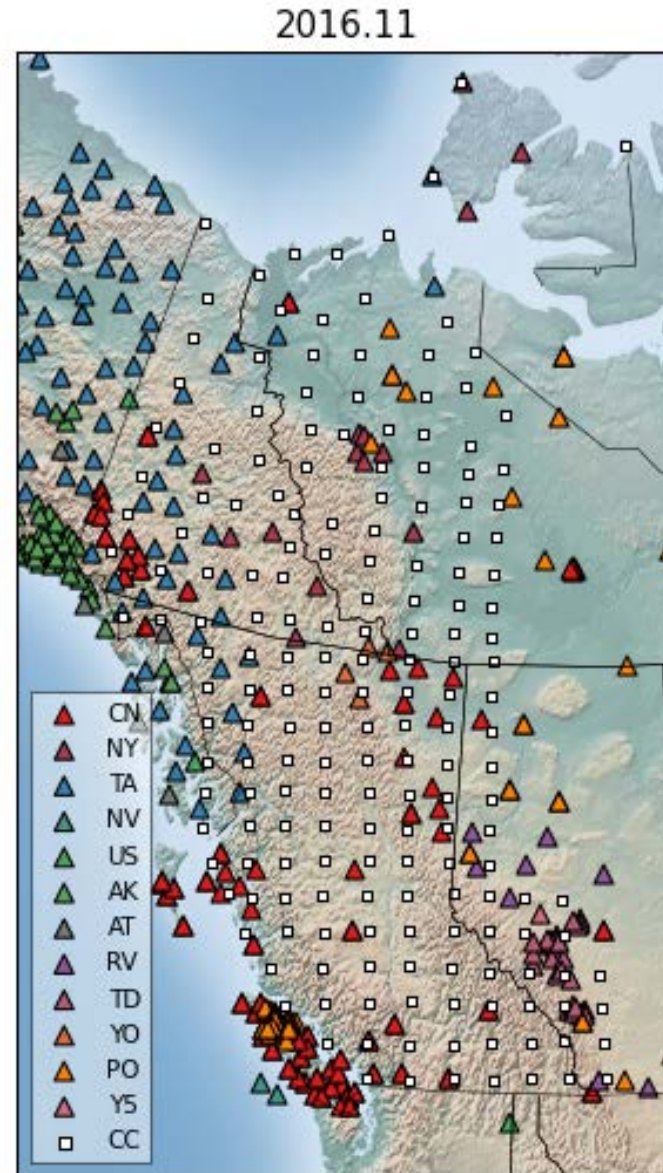
Future work: Canadian Cordillera Array

Seismology:

- Seismicity
- Body-wave velocity models
- Surface-wave velocity models
- Receiver functions
- Seismic anisotropy

Geophysics:

- GPS/geodesy
- Magnetotelluric
- Heat flow
- Potential fields
- ???



CCArray locations
courtesy of A. Schaeffer