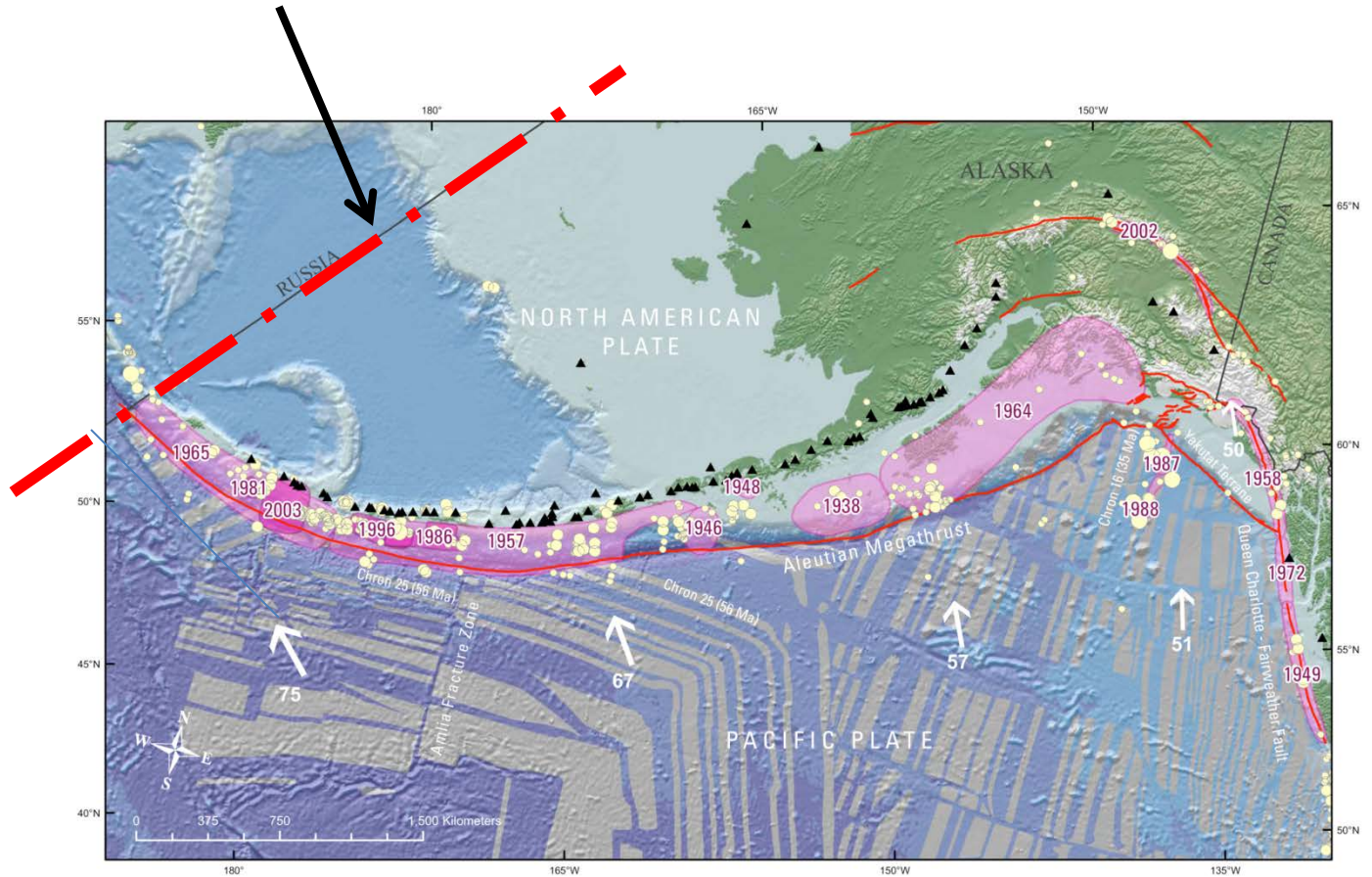
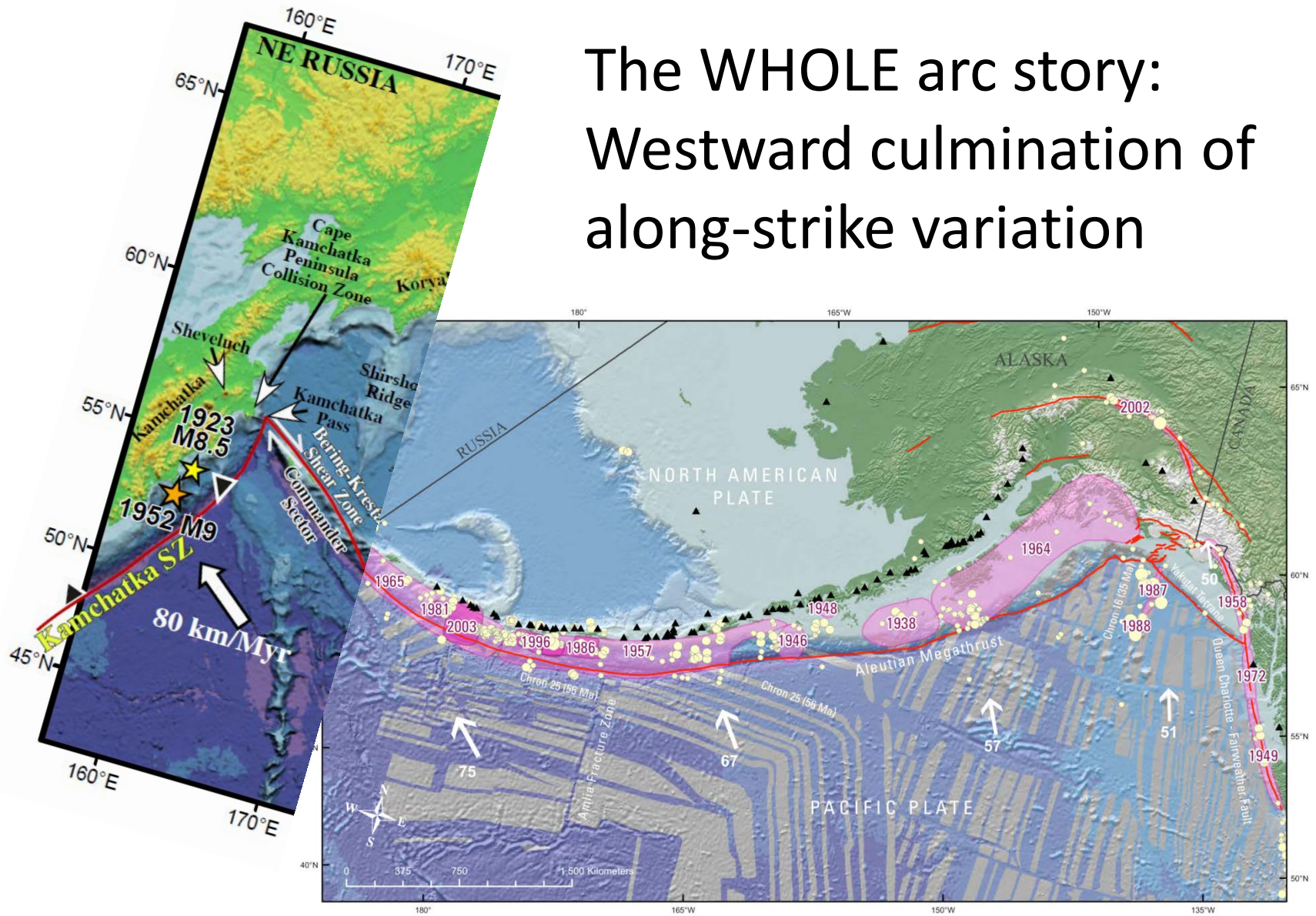


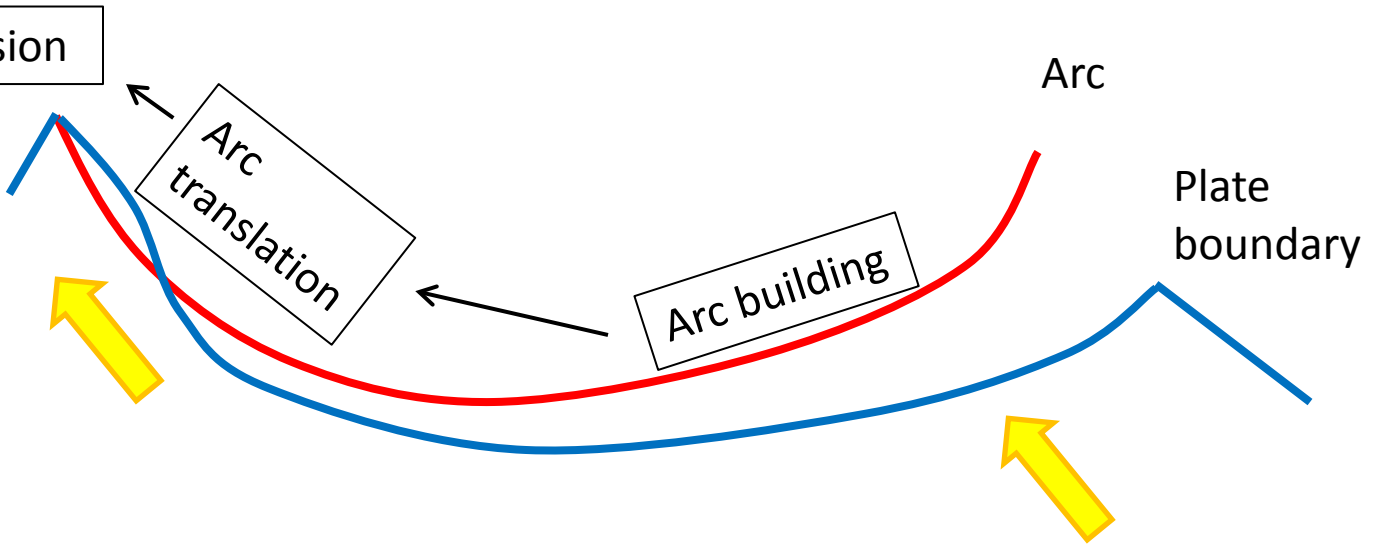
This is not an important geodynamic feature

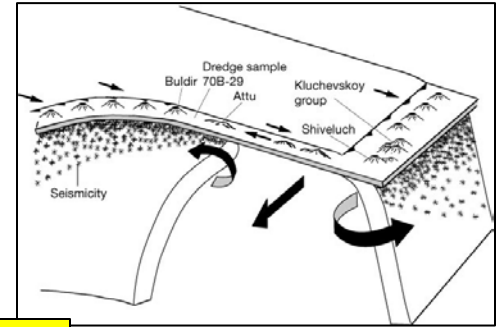
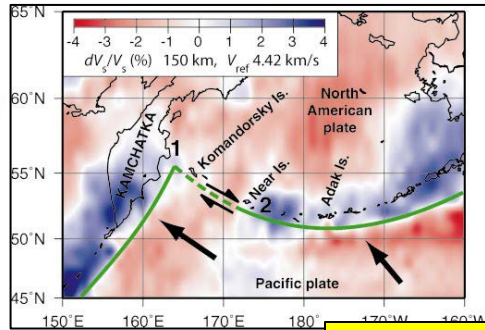
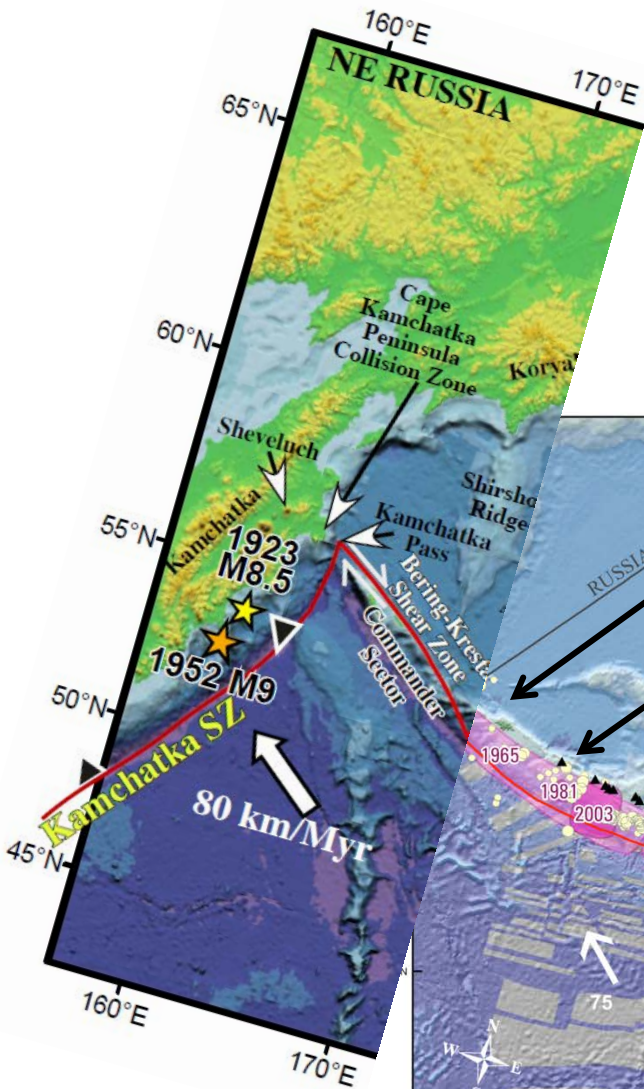


The WHOLE arc story: Westward culmination of along-strike variation



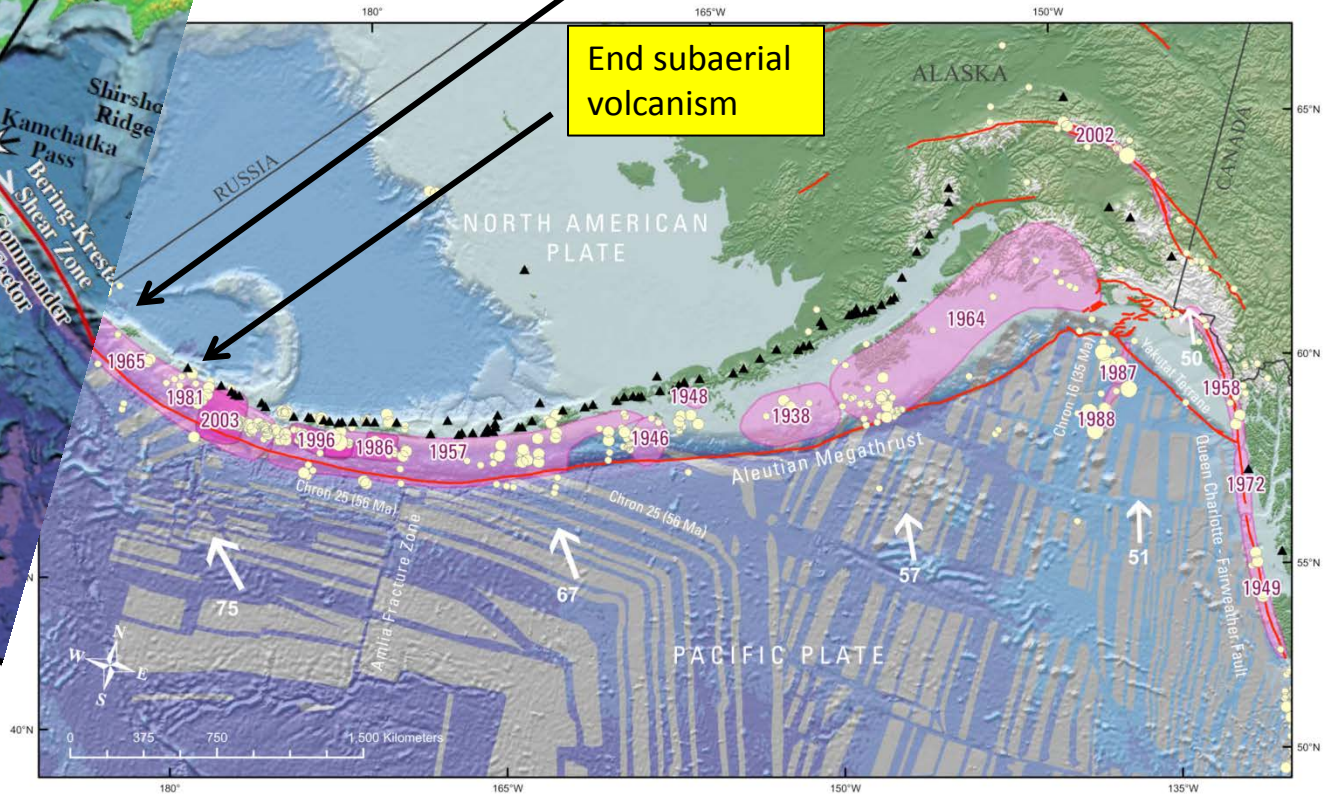
Arc-arc collision

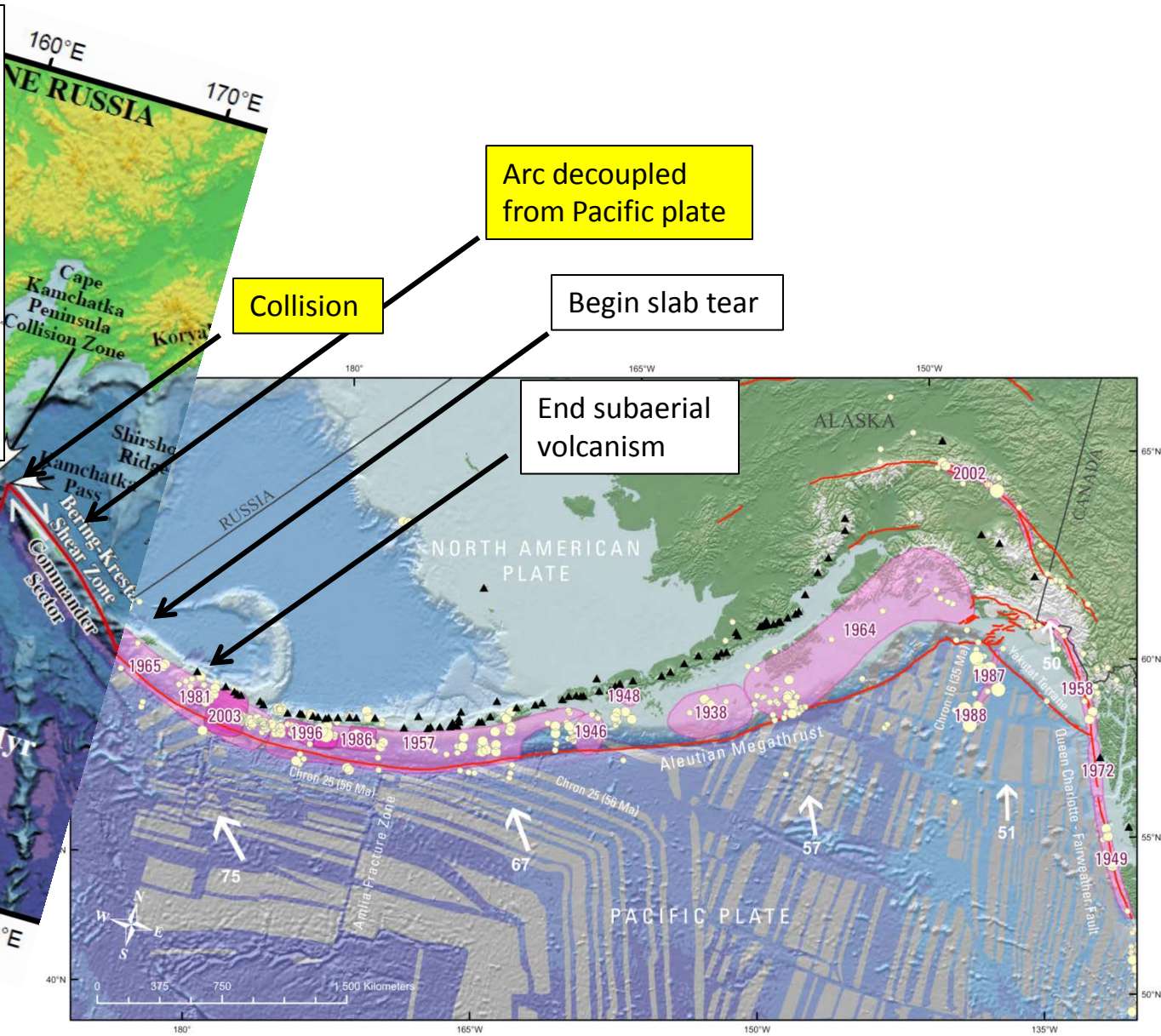
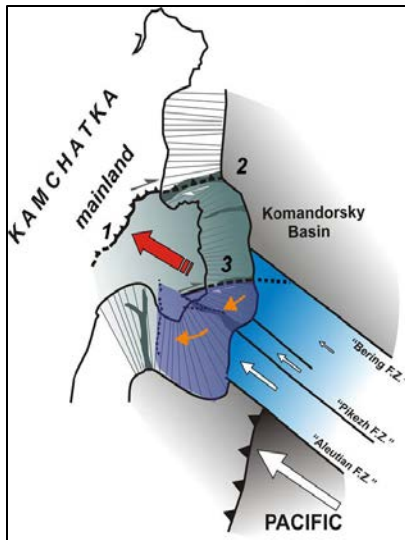




Begin slab tear

End subaerial volcanism





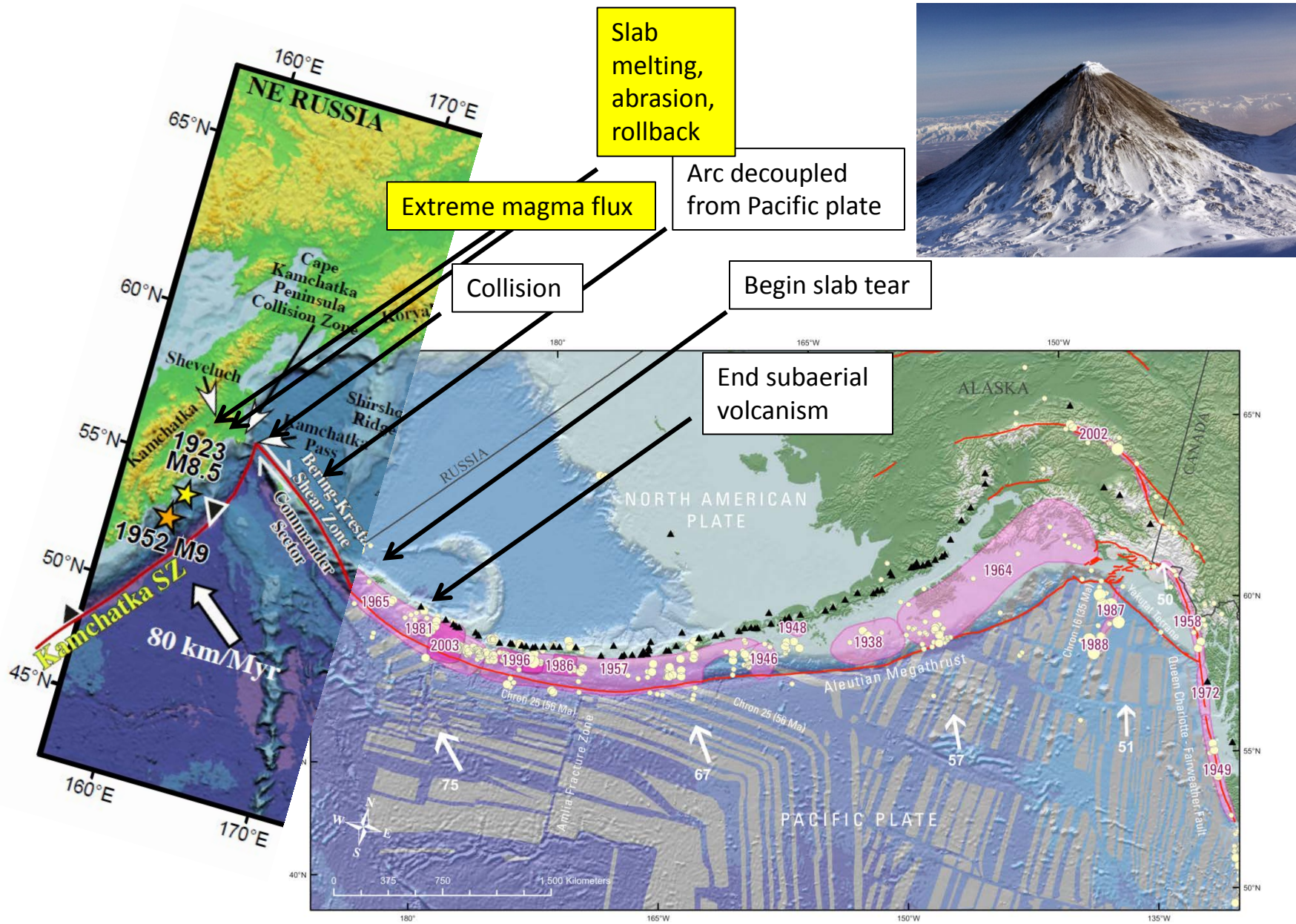
Arc decoupled from Pacific plate

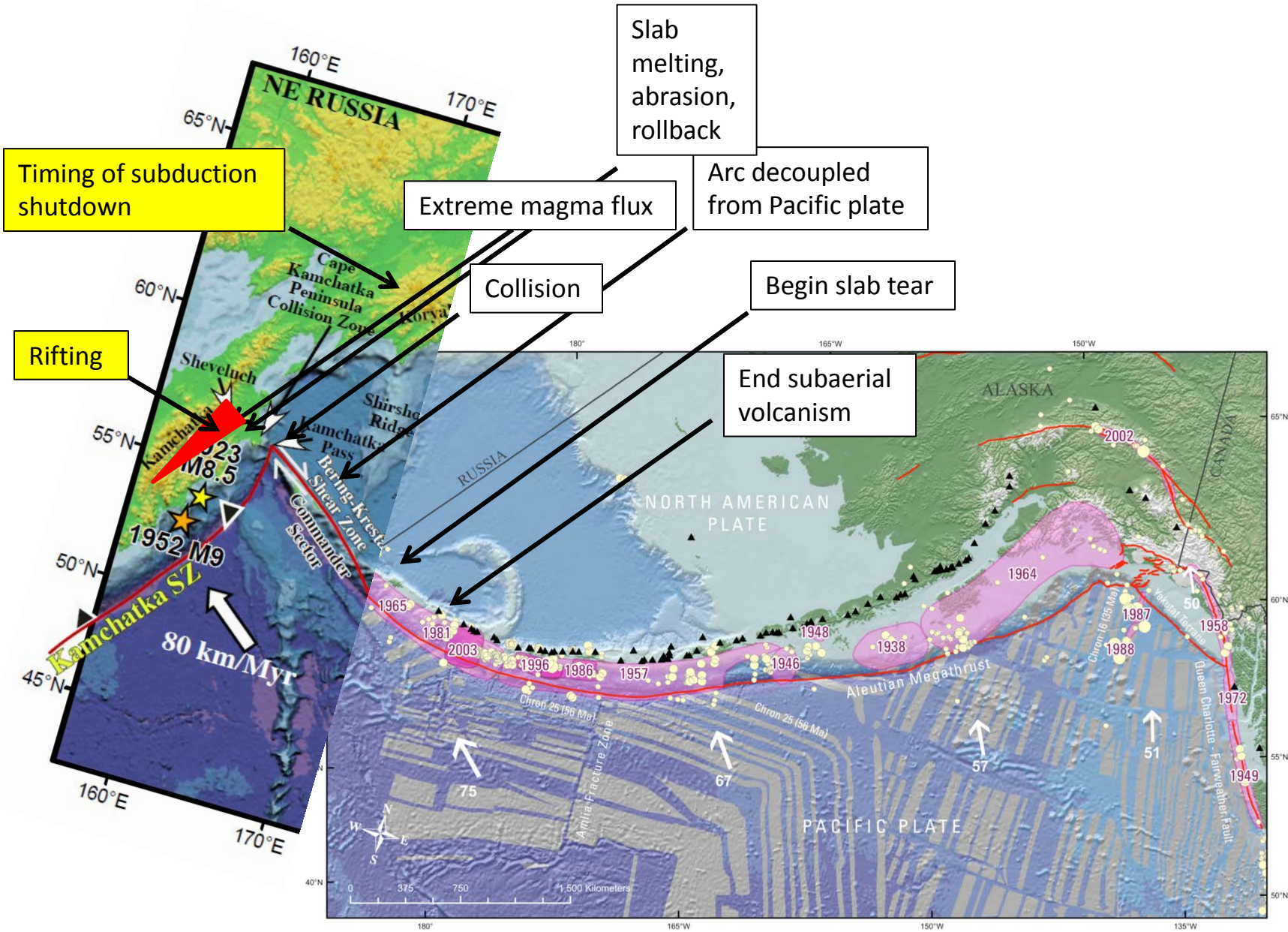
Collision

Begin slab tear

End subaerial volcanism

1923 M8.5
1952 M9
Kamchatka SZ
80 km/Myr





Steps towards bilateral collaboration in northern Pacific geohazards

- August 2011: NSF/USGS and RAS establish working groups to identify areas of common interest.
- August 2011: First meetings of above in US and Russia.
- August 2011: Discussion of Russia-Japan-Germany-US collaborations at JKASP-2011 (Petropavlovsk-Kamchatsky).
- September 2011: Alaska planning for GeoPRISMS
- October 2011: Russian and American groups submit fact sheets to respective governments.
- November 2011: Bilateral Presidential Commission on Science and Technology (Holdren and Fursenko) considers establishment of geohazard subworking group or agreement.



Russian group at MSU 22/08/2011, left to right:

Gennady Sobolev

President, Seismological Council, RAS

Alexander A. Soloviev

Director, International Institute of Earthquake Prediction

Theory and Mathematical Geophysics, RAS

Oleg Melnik

Head, Hydrodynamics Laboratory, Institute of Mechanics,

RAS

Viacheslav K. Gusiakov

Head, Tsunami Laboratory, Institute of Computational

Mathematics

and Mathematical Geophysics, RAS, Novosibirsk

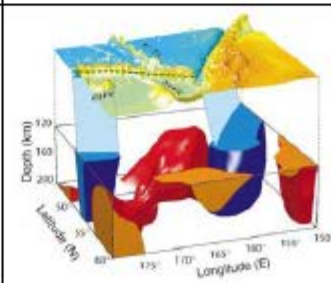
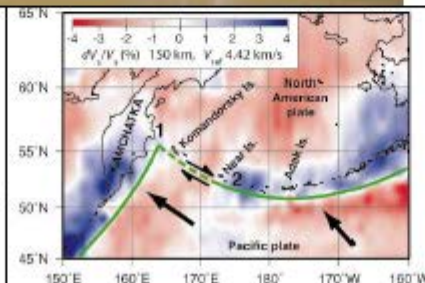
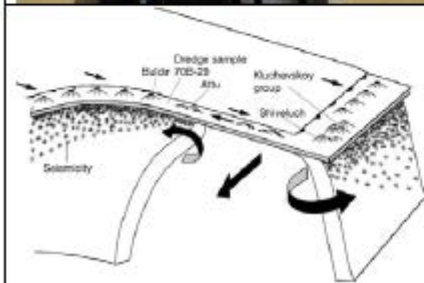
Not shown:

Alik Ismail-Zadeh

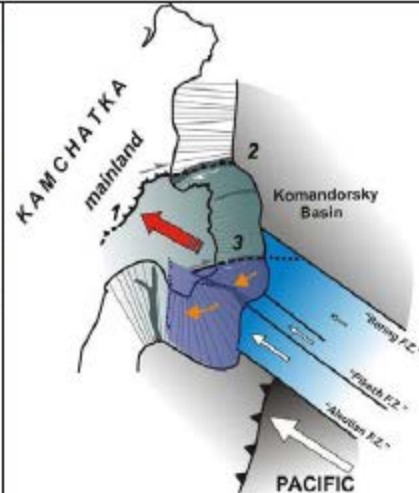
Secretary General, IUGG

Evgeny Gordeev

Director, Institute of Volcanology and Seismology, RAS



Torn Pacific slab: (l) cartoon¹ showing mantle flow; (m) plan view² at 150 km showing slab (blue) absent between Attu and Kamchatka; (r) 3-D perspective² showing asthenosphere (red) rising into slab tear.



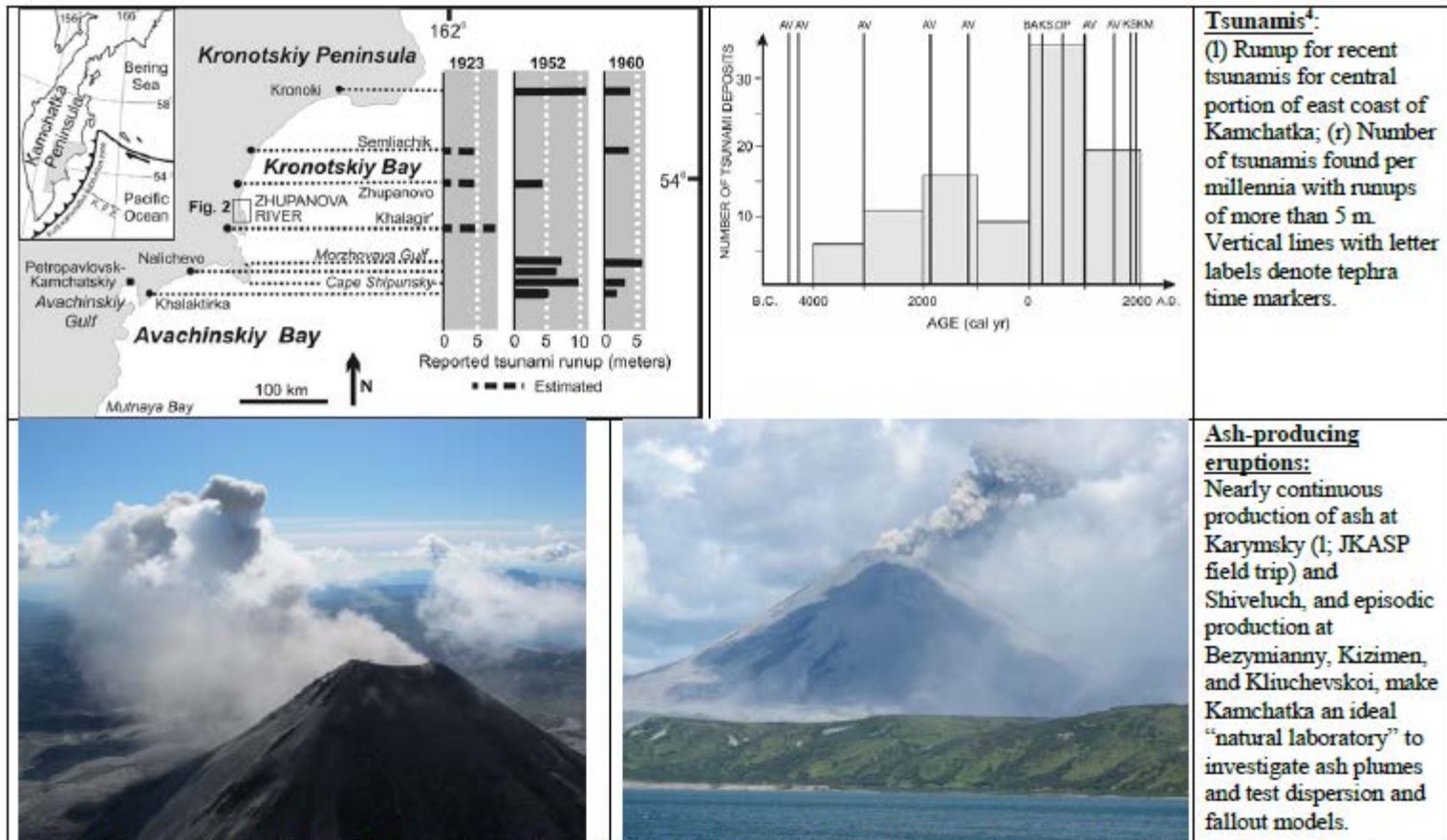
Aleutian Arc colliding with Kamchatka:

Investigation of faults³ records accretion of western-most Aleutian "island" (hypothesis) to Kamchatka at Kamchatsky Cape. Westward through the American and Russian Aleutian islands, coupling is transferred from Bering to Pacific plates, resulting in clockwise block rotation. Two similar capes to the south suggest the junction may be migrating north and may be the earliest Aleutian arc record.



Major risk mitigation project in P-K:

(l) Old apartment building with insufficient external reinforcement; (m) new reinforcement in progress; (x) completed.



1. G. M. Yogodzinski, J. M. Lees, T. G. Churikova, F. Dorendorf, G. Wöerner and O. N. Volynets, Geochemical evidence for the melting of subducting oceanic lithosphere at plate edges, *Nature* 409, 500-504, 2001. 2. V. Levin, N.M. Shapiro, J. Park, M.H. Ritzwoller, Slab portal beneath the western Aleutians, *Geology*, 33, 253-256, 2005. 3. A. Kozhurin and T. Pinegina, Active faulting in the Kamchatka Peninsula as evidence for the Kamchatka-Aleutian collision (presentation), JKASP2011. 4. T. K. Pinegina, J. Bourgeois, L. I. Bazanova, I. V. Melekestsev and O. A. Braitseva, A millennial-scale record of Holocene tsunamis on the Kronotskiy Bay coast, Kamchatka, Russia, *Quaternary Research*, 59, 36-47, 2003.

Theme	Geology	Monitoring	Data interpretation and modeling	Model testing	Application
Earthquakes	Faults, chronology, and structure: Magnitude, recurrence, dynamics, impact	Currently sparse: Expansion in telemetered seismic and CGPS with real-time data sharing	E.g., Block and fault dynamics model (BAFD)	At highly active “natural laboratory” sites	Probabilistic risk forecasting;
Tsunamis	Paleotsunamis: Inundation, recurrence, correlation with earthquakes	Real-time seismic and GPS; buoys	Local inundation based on bathymetry and topography	Following events	Delineate hazard zones; alarm systems; education
Volcanic eruptions	History in terms of size, chemistry, explosivity, recurrence, ash distribution	Seismic, GPS, gas, radar; many volcanoes in Aleutians lack any instrumentation	Improve short-term eruption forecasting; improve models for explosive eruption including “source term”, ash dispersion, and fallout		