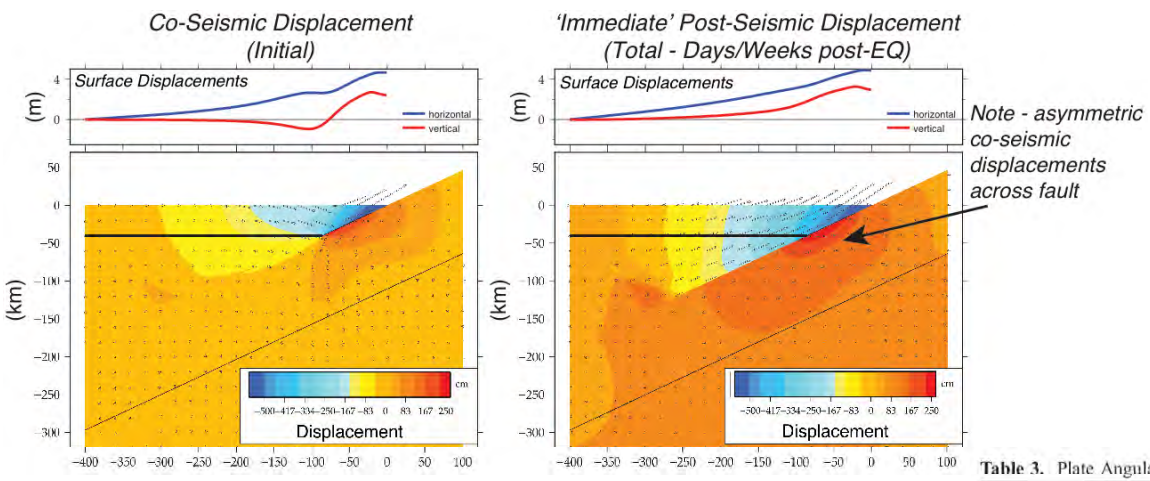
Effectively Communicating Your Research



2018 Graduate Colloquium
Department of Geosciences

Table 3. Plate Angular Velocities Relative to ITRF-97 in Cartesian Coordinates With Covariance Matrix

Plate[a]	ωX^b	ωY^b	ωZ^b	xx^c	xy^c	xz^c	yy^c	yz^c	zz^c
Am	−1.746969	−1.824311	5.121903	0.857324	−1.063607	−1.096796	1.347375	1.378061	1.438827
An	−1.431031	−1.481635	3.358330	0.002206	0.000481	−0.001042	0.005049	−0.008574	0.028016
Ar	5.653346	0.285876	7.109457	0.110933	0.107269	0.082829	0.111556	0.083046	0.072361
At	10.231864	5.029467	10.335698	101.943568	65.724799	100.431138	42.396490	64.759834	98.973900
Au	7.046423	5.557522	6.250947	0.009488	−0.009391	0.007173	0.012160	−0.008208	0.009718
Ca	−0.056119	−3.751012	2.903333	0.029068	−0.061974	0.019386	0.144467	−0.044556	0.020405
Cs	−1.131332	−3.247545	4.836032	0.253516	−0.454367	−0.297816	0.831822	0.542589	0.366409
Eu	−0.499530	−2.309197	3.821139	0.002968	0.000972	0.004096	0.000727	0.001536	0.007045
In	4.852852	−1.208854	6.795223	0.064093	0.289369	0.072830	1.335119	0.335702	0.088999
Na	0.658291	−3.411026	−0.144969	0.000114	−0.000075	0.000066	0.001038	−0.000799	0.000962
Nu	0.459991	−2.658697	3.484752	0.007755	−0.000608	0.001160	0.001553	−0.000336	0.004719
Nz	−1.329904	−7.952151	7.910255	0.015252	0.034933	0.015391	0.140454	0.058358	0.036803
Ok	3.107407	−5.000841	−4.587389	1.822874	−1.538042	−1.838730	1.317255	1.561148	1.884001
Pa	−1.923772	4.589783	−10.300427	0.009299	0.001117	−0.000448	0.002121	−0.000067	0.005219
Ph	9.423451	−5.530138	−11.523673	0.316389	−0.337266	−0.192008	0.370821	0.208181	0.131048
Sa	−1.189878	−1.174240	−0.809045	0.015218	−0.013617	−0.003420	0.015430	0.003466	0.005410
So	−0.644017	−3.150603	4.346639	0.002358	0.002195	−0.000185	0.002151	−0.000177	0.000253
Sr	−2.860888	−7.064668	1.463571	0.615256	1.043353	−0.941995	1.777408	−1.602858	1.452819
Su	0.285162	−5.332412	4.302467	0.128464	−0.464367	0.020302	1.736351	−0.075708	0.016525

[a] Plate abbreviations are listed in Table 1.
[b] Units for ω are 10^{-3} rads/Myr with the X, Y, Z axes being parallel to (0°N,0°E), (0°N,90°E), and 90°N, respectively.
[c] These six columns give the indicated elements of the covariance matrix (10^{-6} rads^2/Myr^2).

Do's and Don'ts

PennState

Kevin P Furlong

Before you start -

What is the goal of your presentation?

12 Minute Talk = 1 Take-home Message or Goal

Could be a *new result*, potential of a *new project*, an unexpected *observation*

Work Backwards from that Goal

Talk is NOT a Blow-by-Blow account of your research
Talk is NOT an How-to tutorial - its an opportunity to engage others in your research

Graduate Student Colloquium Judging Rubric

Thank you for participating in the 50th Annual Geosciences Graduate Student Colloquium. Judge participation plays a vital role in student development through the success of the symposium.

Scoring

All students will be judged alongside their peers. **Early-stage graduate students, who may be developing their research and communication abilities, are not expected to receive scores equal to the scores of senior students.** Our goal is to see students' scores improve as they advance in their graduate careers. In judging, please provide an integer score commensurate with the student's level as outlined in the scoring key with evaluative definitions below.

1: Limited Attempt - the student showed a limited knowledge, attempt, communication, or quality of work.

2: Developing - the student's work came across correctly, but lacked clarity or quality in some aspect.

3: Intermediate - the student accurately and efficiently delivered all necessary information.

4: Advanced – the student displayed a depth and breadth of ability.

5: Mastering – the student showed a practiced and perfected performance.

Judging Categories

Statement of Research Problem:

Questions or hypotheses being addressed are clearly and thoughtfully stated.
Significance of the project is clearly and concisely explained to a general geosc. audience.
Motivations and broader impacts stated.

Background/Methods:

Relevant previous work succinctly reviewed; gap in knowledge for study identified.
Clear and concise description of methods used.
Methods are appropriate to address questions/hypotheses.

Analysis/(Potential) Results:

Results are presented clearly and accurately.
Analysis is well explained and appropriately applied.
Results connected to the state significance/purpose of the projected and placed in broader framework.

Conclusions/Discussions:

Study's questions/hypotheses are clearly addressed.
Interpretations/Conclusions are sufficiently supported by results.
Study is innovative and has potential to contribute to the field.

Presentation Skills/Communication:

Eye contact, body language, speaking pace appropriate.
Correct length of presentation (5 min for poster and 12 min for talk).
Presenter answered questions appropriately and thoughtfully.

Quality of the Presentation:

General appearance (background color, spacing, layout).
Text (font size, concise, grammar, spelling).
Appropriate use of figures/tables (relevant, informative, appealing).
Flow of information is logical and facilitates understanding.

Plan 12 Minutes! [not 15 min.]

Max 12 +/- slides

Any slide with content should be viewable for ~ 1 minute

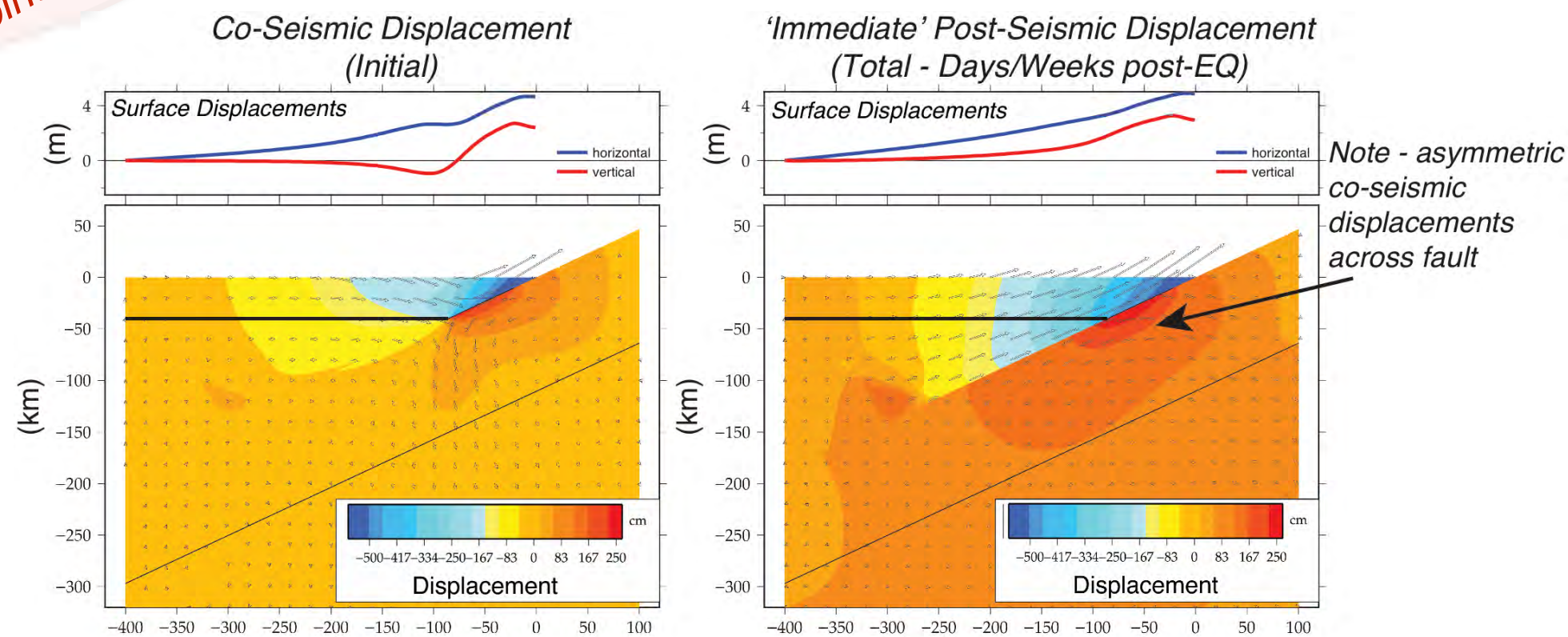
Every slide should have a purpose and point - make sure it focuses on that purpose/point
[can you succinctly tell me the point of each figure]

EVERY SLIDE MATTERS!
(or don't show it)

Can I easily make the point of this slide clear?

Co-Seismic (plus immediate post-seismic):

1. ***Co-seismic primarily restricted to elastic layer***
2. ***Rapid migration of deformation into V.E. Region***
3. ***"Observed" 'After-slip' a combination of near-fault and far-field displacements.***



Structure of Your Presentation

————————*Act 1* ————————-—

Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]

————————*Act 2* ————————-—

Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]

————————*Act 3* ————————-—

Summary/Conclusions (key points) [1-2 slides]

[Note: ***No*** Table of Contents; ***No*** list of references]

Linkage between Structure of Talk and Judging Rubric

Act 1

- ***Title Slide*** (including authors, affiliations) [1 slide]
- ***Motivation*** (questions, observations, etc.) [1-2 slides]
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Act 3

- ***Summary/Conclusions*** (key points) [1-2 slides]

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SCIENCE

LOGISTICS

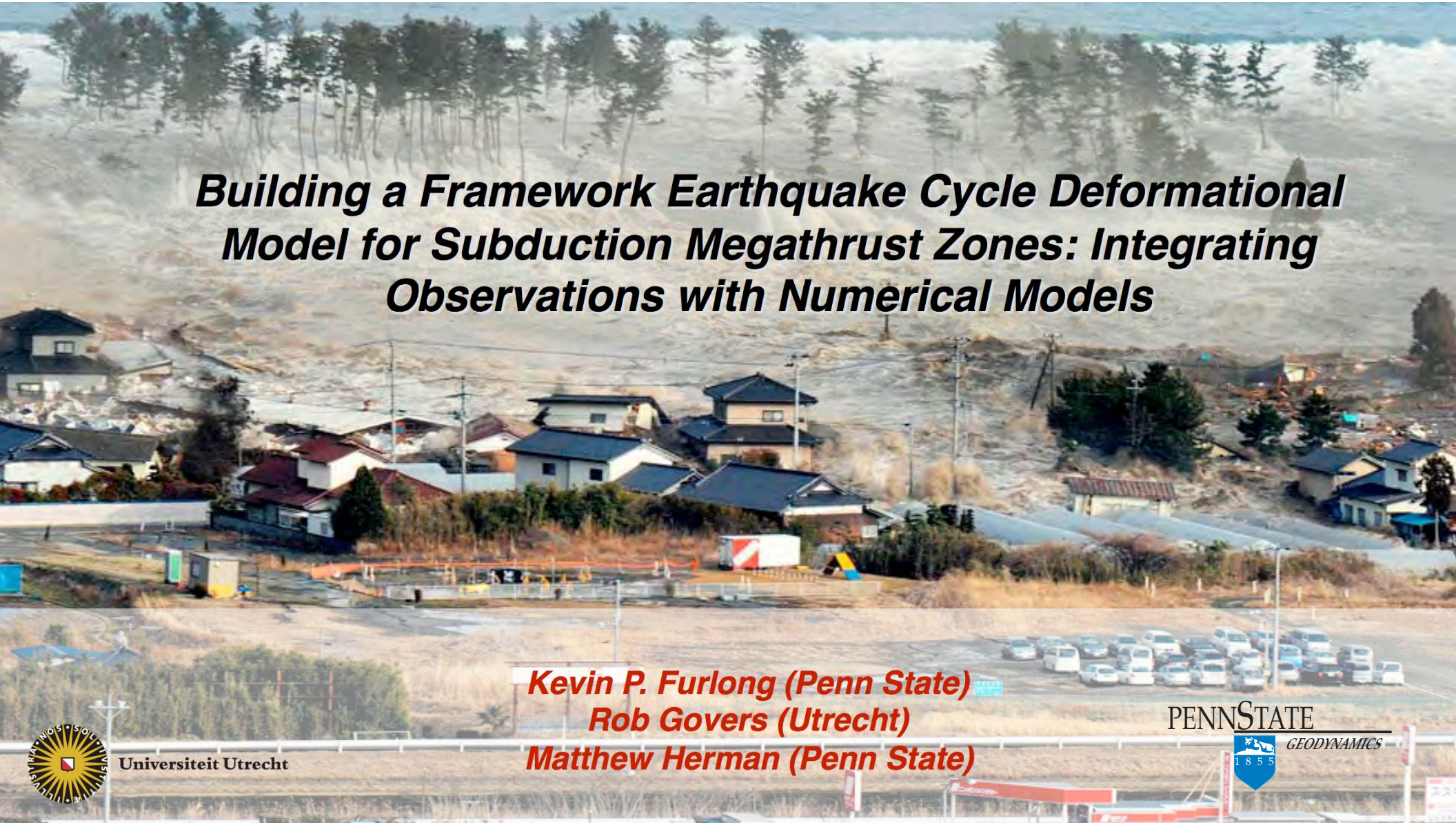
———————Act 1 ———————-—

Structure of Your Presentation

Title Slide (including authors, affiliations)

- include a figure/picture if it provides context to your presentation
- Do NOT read your title slide to audience
- Use the title slide to acknowledge your advisor/co-authors
- Use the title slide to summarize your presentation - this is not a QVC sales pitch!

——————————Act 1 ——————-—
Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]
——————————Act 2 ——————-—
Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]
——————————Act 3 ——————-—
Summary/Conclusions (key points) [1-2 slides]



Building a Framework Earthquake Cycle Deformational Model for Subduction Megathrust Zones: Integrating Observations with Numerical Models

Kevin P. Furlong (Penn State)
Rob Govers (Utrecht)
Matthew Herman (Penn State)

Universiteit Utrecht

PENNSTATE GEODYNAMICS 1855

Structure of Your Presentation

Motivation (questions, observations, etc.)

- Remember your Audience
- Can be in the form of questions, observations, hypothesis, previous results….
- Prepares the audience for the focus of your presentation
- Keep it succinct!

——————————Act 1 ——————-—
Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]
——————————Act 2 ——————-—
Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]
——————————Act 3 ——————-—
Summary/Conclusions (key points) [1-2 slides]

Can We Use THIS

To Anticipate THIS

Research Paper

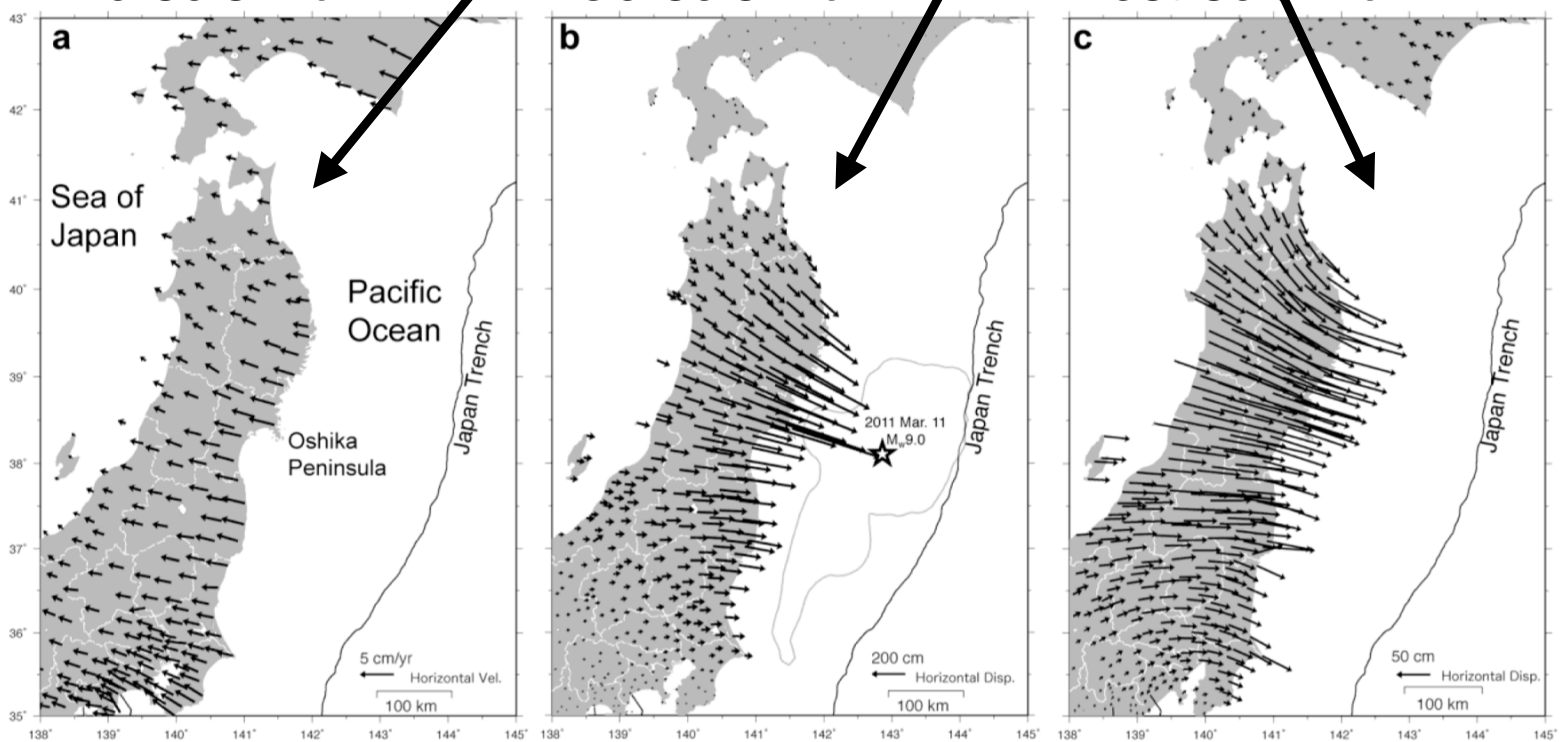
Pre-, co-, and post-seismic deformation of the 2011 Tohoku-oki earthquake and its implication to a paradox in short-term and long-term deformation

Pre-, co-, and post-seismic deformation of the 2011 Tohoku-oki earthquake and its implication to a paradox in short-term and long-term deformation

Takuya Nishimura

Journal of Disaster Research (2014), 9(3): 294-302

Pre-seismic *Co-seismic* *Post-seismic*



Structure of Your Presentation

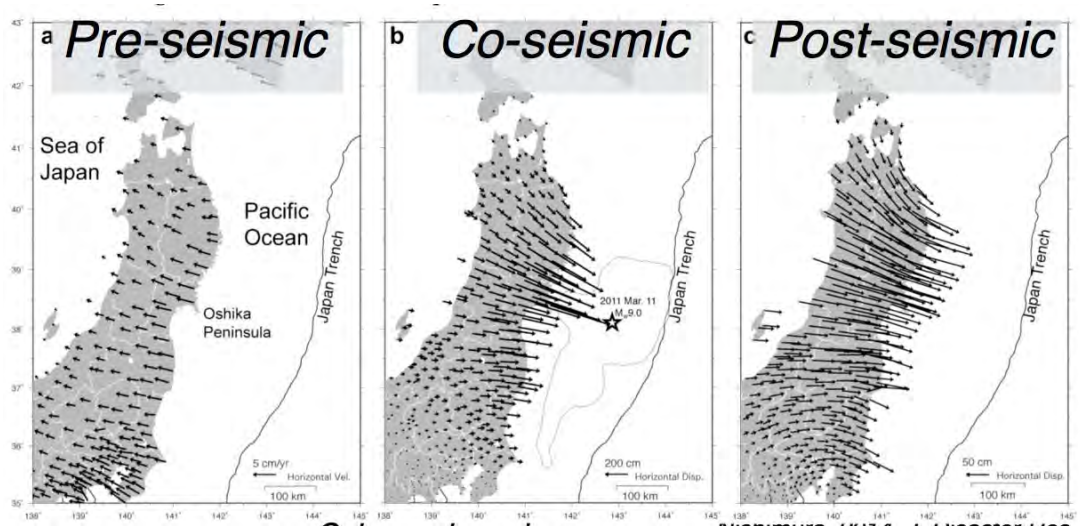
Background

- Remember your Audience
- What they (***the audience***) need to follow your presentation
- Previous work, theory, debates, etc.
- if you lose the audience here, you might as well stop and offer them coffee

——————————Act 1 ——————-—
Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]
——————————Act 2 ——————-—
Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]
——————————Act 3 ——————-—
Summary/Conclusions (key points) [1-2 slides]

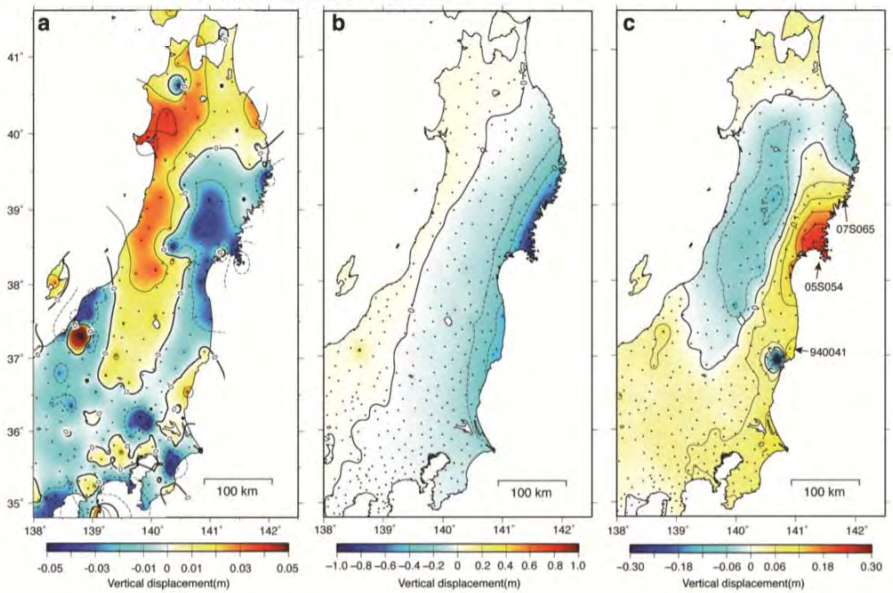
Observed Displacements (GPS) Pre-, Co-, and Post-seismic show disparate patterns in both horizontal and vertical directions

Use 1 or 2 slides to provide the context needed - BUT not everything done previously!

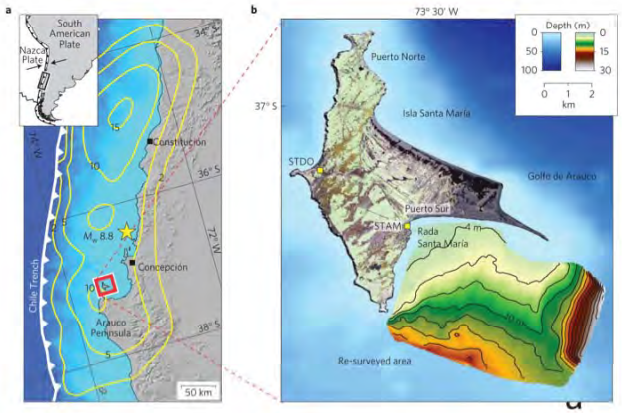


Color scale varies

Nishimura, 2014, J. Disaster Res.



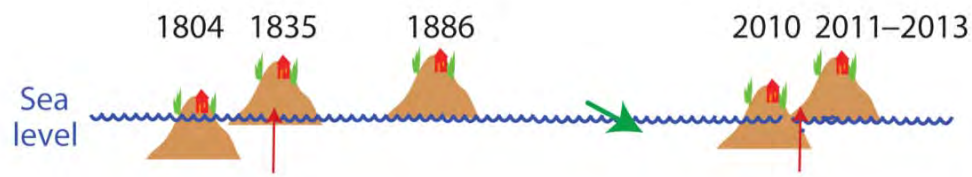
A 'Geodetic' Record over the entire EQ cycle



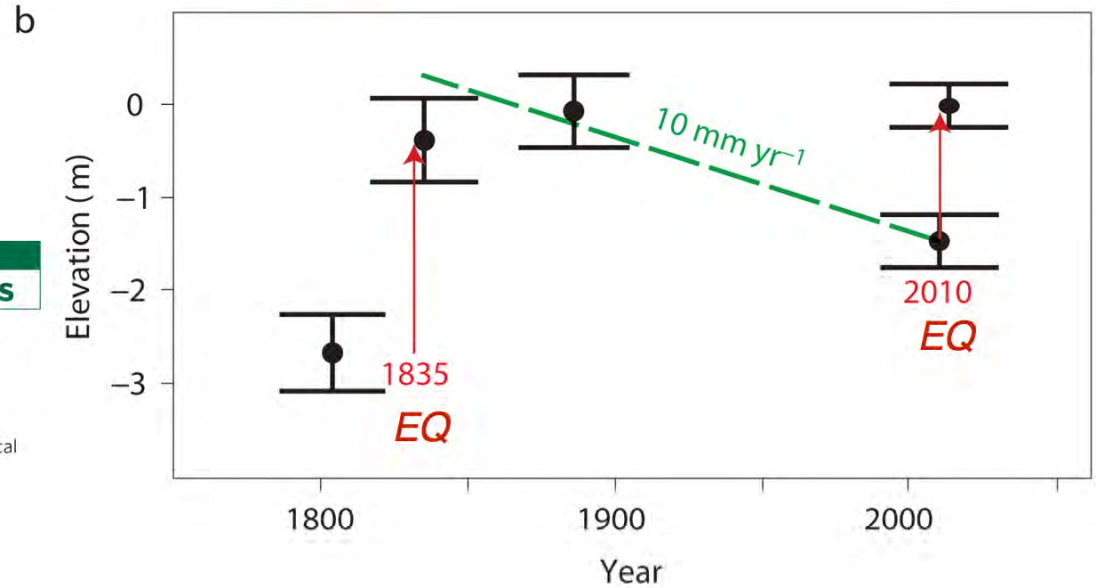
nature geoscience LETTERS
PUBLISHED ONLINE: 22 JUNE 2015 | DOI: 10.1038/NGEO2468

Vertical deformation through a complete seismic cycle at Isla Santa María, Chile

Robert L. Wesson[1]*, Daniel Melnick[2], Marco Cisternas[3], Marcos Moreno[4] and Lisa L. Ely[5]



Vertical Motions over the entire EQ cycle show variable behavior short-term and long-term after the EQ



news & views

EARTHQUAKES

The rise and fall of an island

Earth's crust was thought to deform uniformly over most of the seismic cycle. Analysis of two centuries of nautical surveys from Chile reveals temporal variability that complicates our view of time-dependent seismic hazards.

Aron J. Meltzner

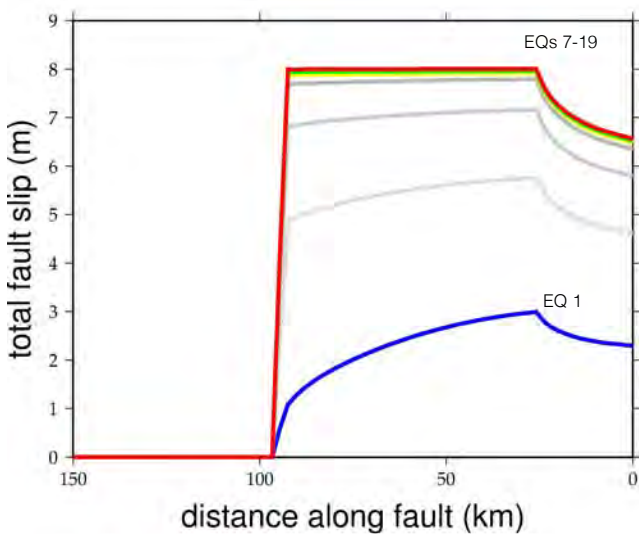
———————Act 2 ———————-—

Structure of Your Presentation

Analyses/Data/Models

- Here you present your work
- Keep slides simple and ***accessible***
- Minimal interpretations, only what is necessary to prepare for further results
- If multiple content (Data + Models) keep them clearly separate

———————————***Act 1*** ———————-—
Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]
———————————***Act 2*** ———————-—
Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]
———————————***Act 3*** ———————-—
Summary/Conclusions (key points) [1-2 slides]

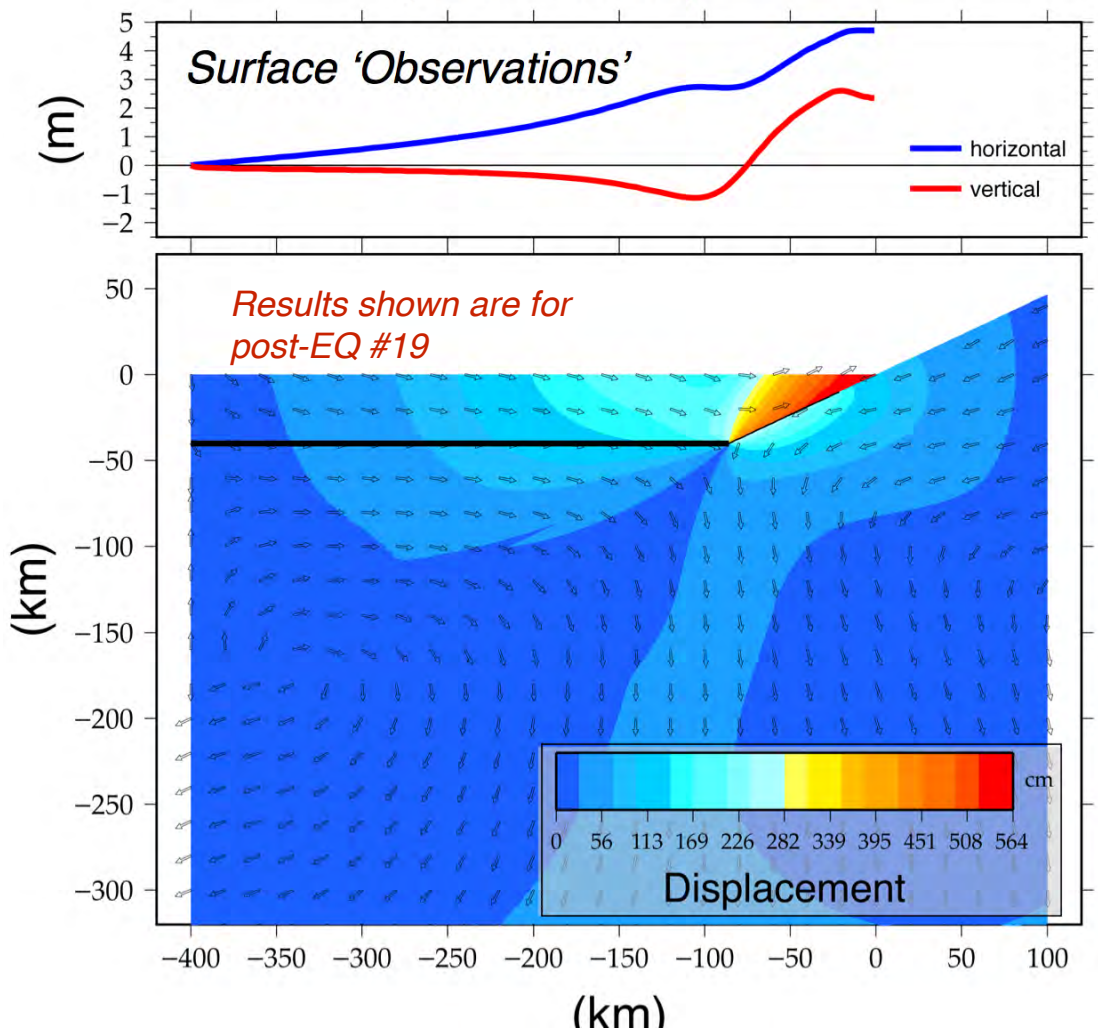


Co-seismic Fault Slip
(need for model 'spin-up')

Plate Motion = 4 cm/yr
[continues throughout cycles]

EQ recurrence 200 years
[8 m slip; is varied for different models

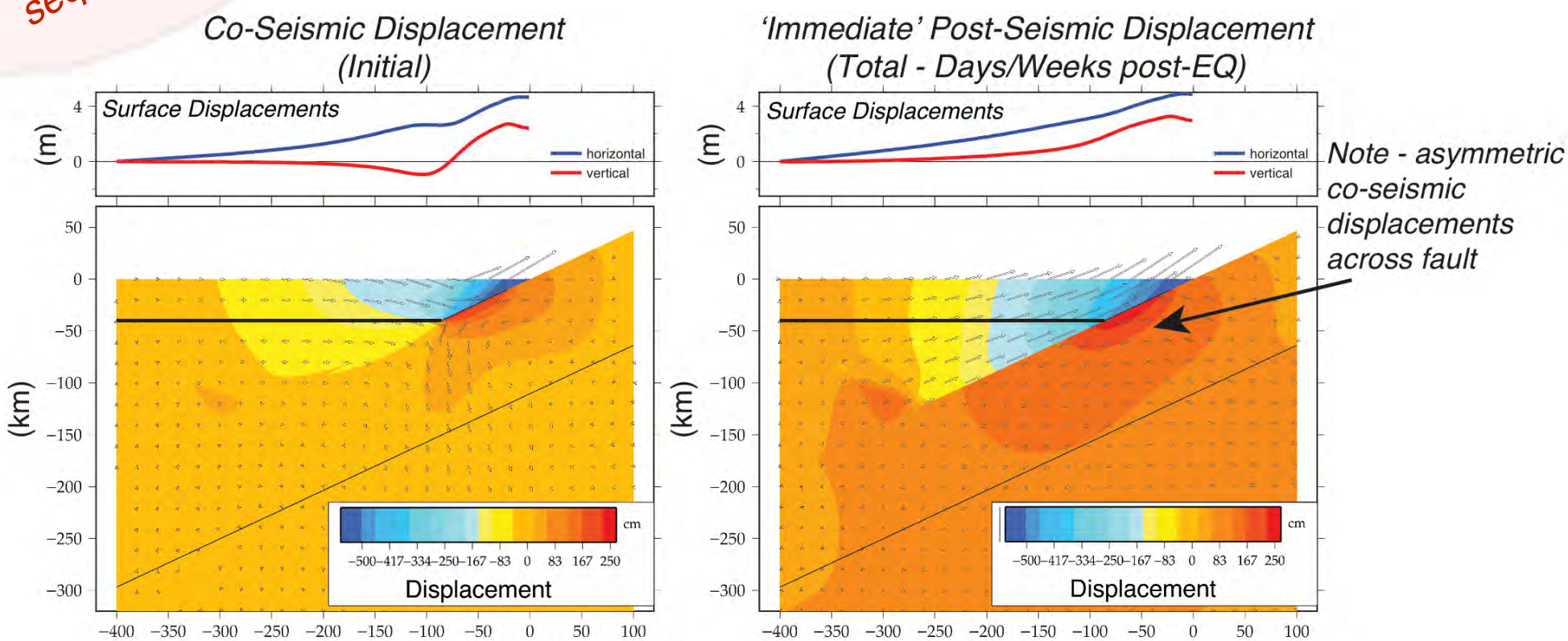
Co-seismic Displacement
(Visco-elastic)

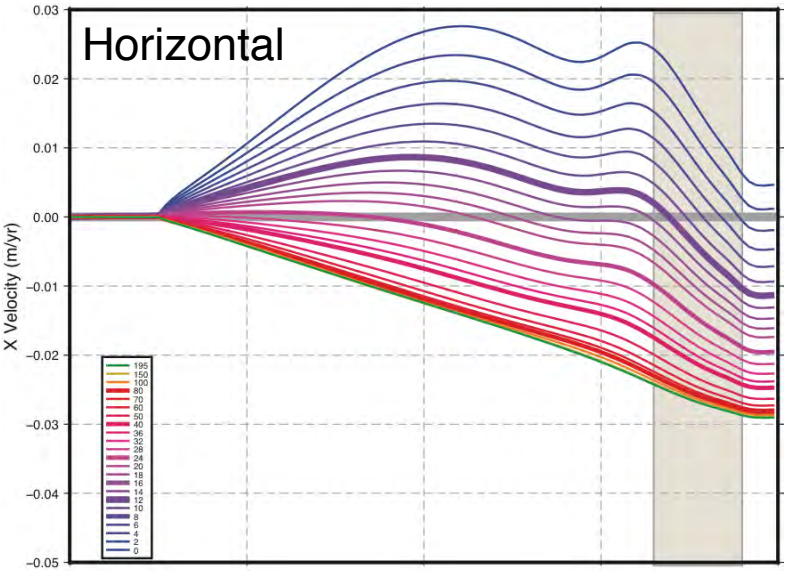


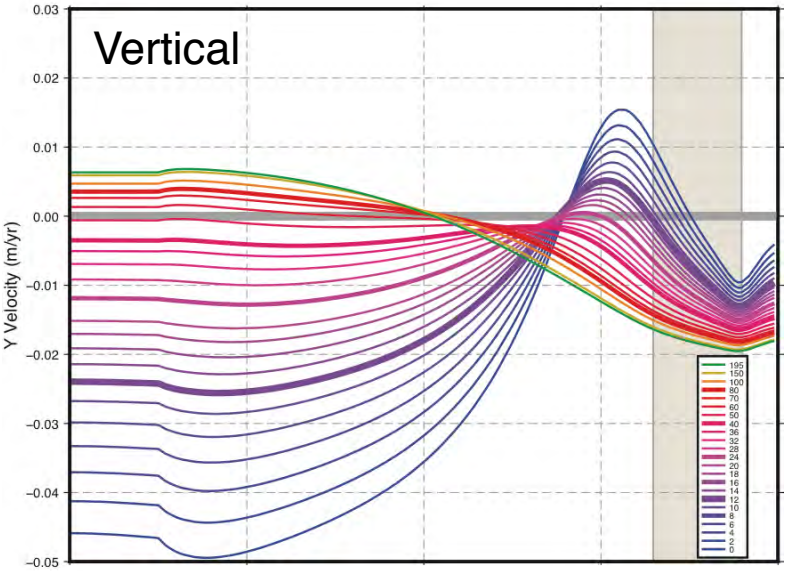
Lead the audience through your work through logical sequence of slides

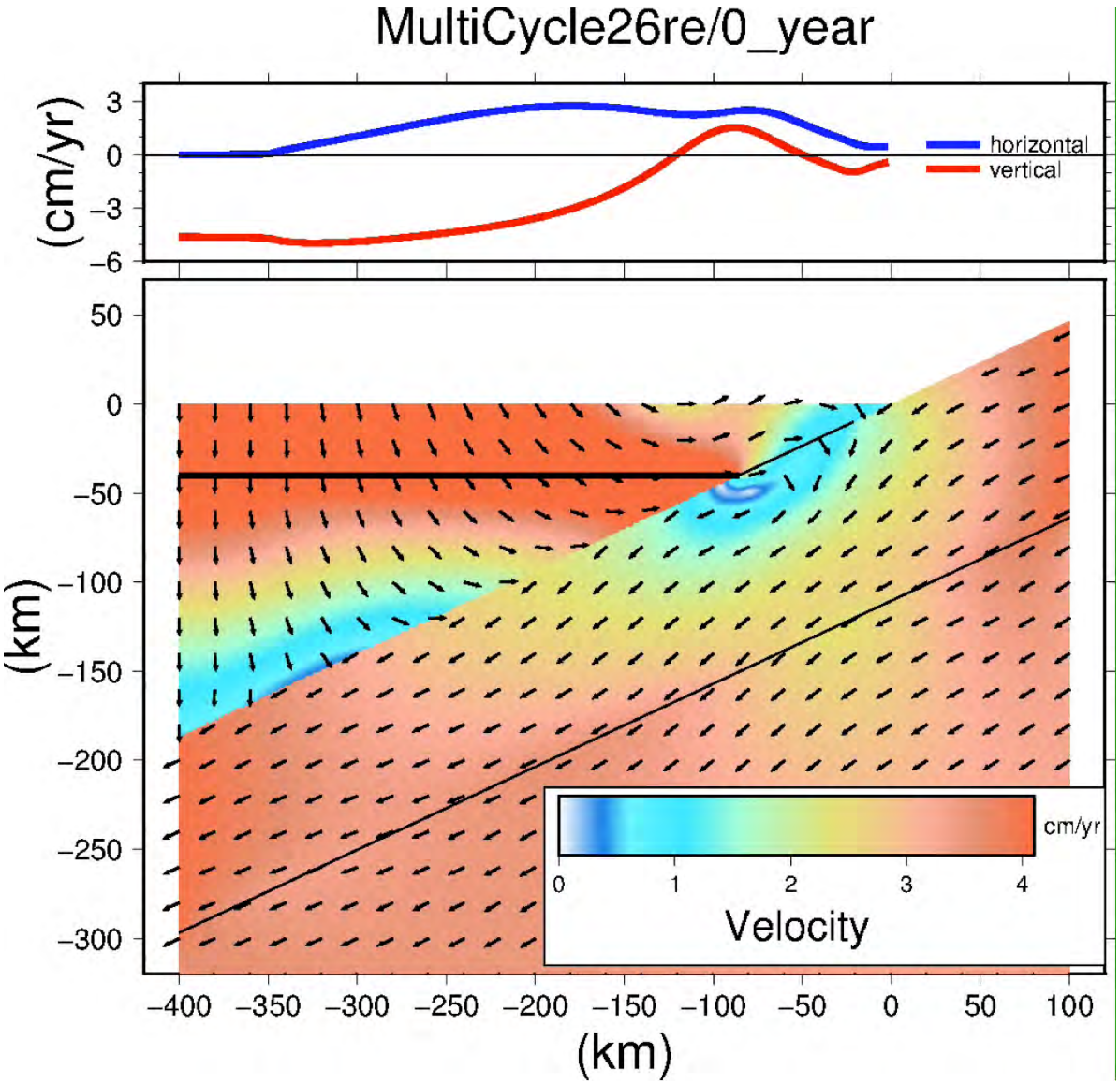
Co-Seismic (plus immediate post-seismic):

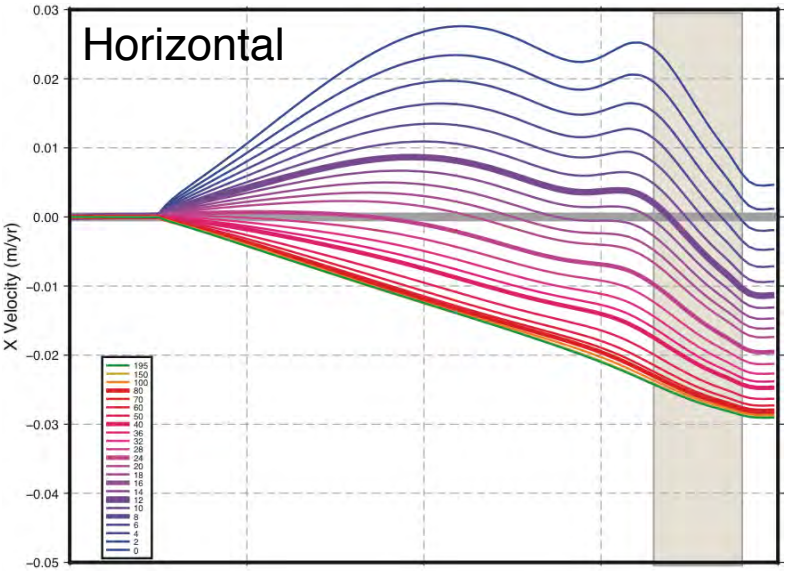
1. ***Co-seismic primarily restricted to elastic layer***
2. ***Rapid migration of deformation into V.E. Region***
3. ***"Observed" 'After-slip' a combination of near-fault and far-field displacements.***




Horizontal
X Velocity (m/yr)
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
−0.05


Vertical
Y Velocity (m/yr)
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
−0.05


MultiCycle26re/0_year
(cm/yr)
3
0
−3
−6
horizontal
vertical
(km)
50
0
−50
−100
−150
−200
−250
−300
cm/yr
0
1
2
3
4
Velocity
−400
−350
−300
−250
−200
−150
−100
−50
0
50
100
(km)


Horizontal
X Velocity (m/yr)
0.03
0.02
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−0.01
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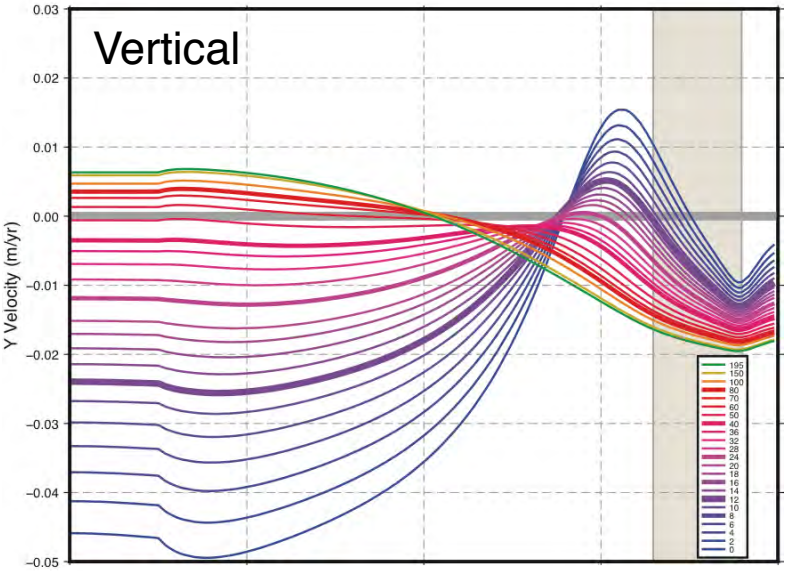
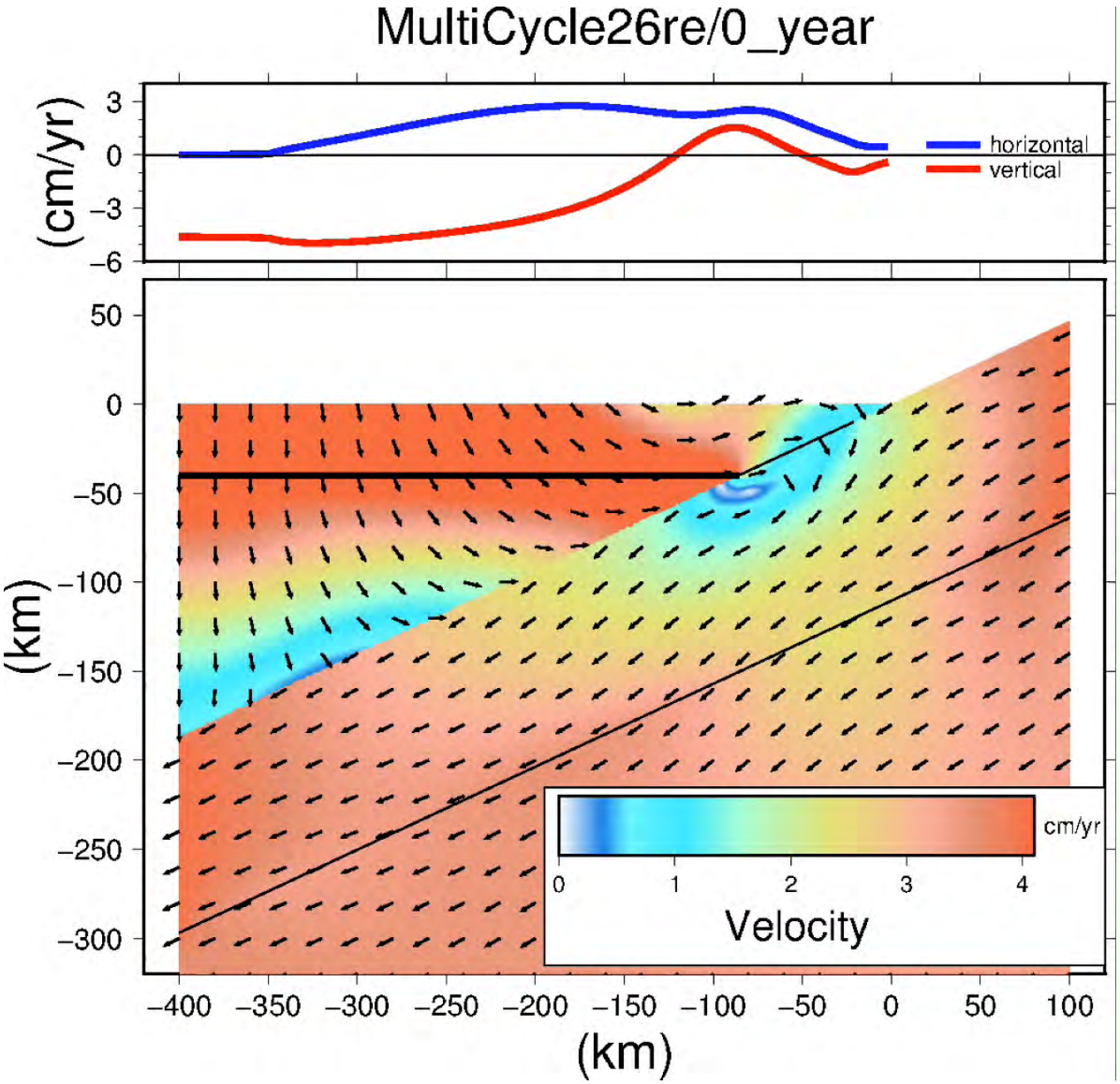
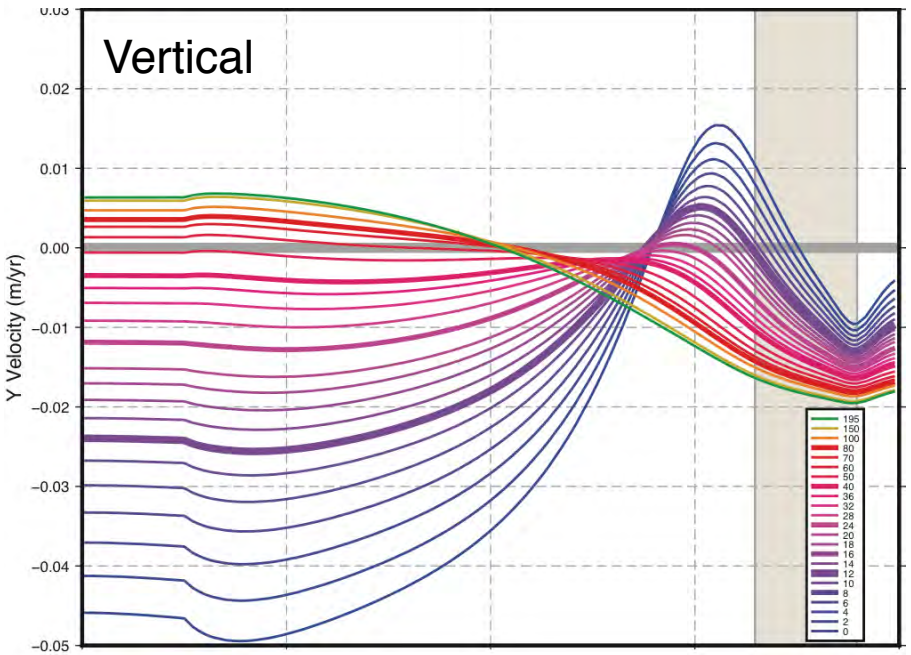
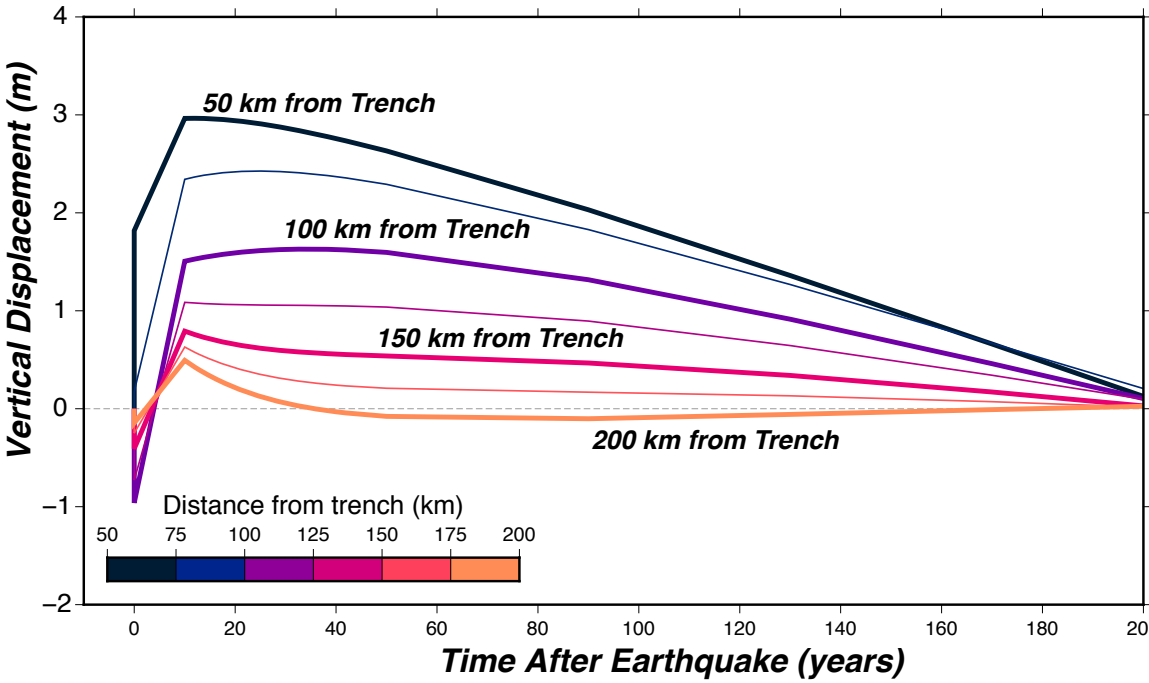
−0.03
−0.04
−0.05


Vertical
Y Velocity (m/yr)
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
−0.04
−0.05


MultiCycle26re/0_year
(cm/yr)
3
0
−3
−6
horizontal
vertical
(km)
50
0
−50
−100
−150
−200
−250
−300
cm/yr
0
1
2
3
4
Velocity
−400
−350
−300
−250
−200
−150
−100
−50
0
50
100
(km)





What about the vertical behavior?

- *Post-EQ motions vary substantially spatially and temporally*
- *Co-seismic and 'afterslip' may be in opposite directions*
- *'Afterslip' and post-seismic motions occur simultaneously*
- *For simplicity, we assume ~ 10 years as average time of "afterslip"*

Structure of Your Presentation

Interpretations

- Remember your motivations
- Stay focused on Take-home message - here is where you make those points - you cannot tell everything about your work!
- If revisiting data add additional slides - don't go backwards
- Here is where you make the main science point

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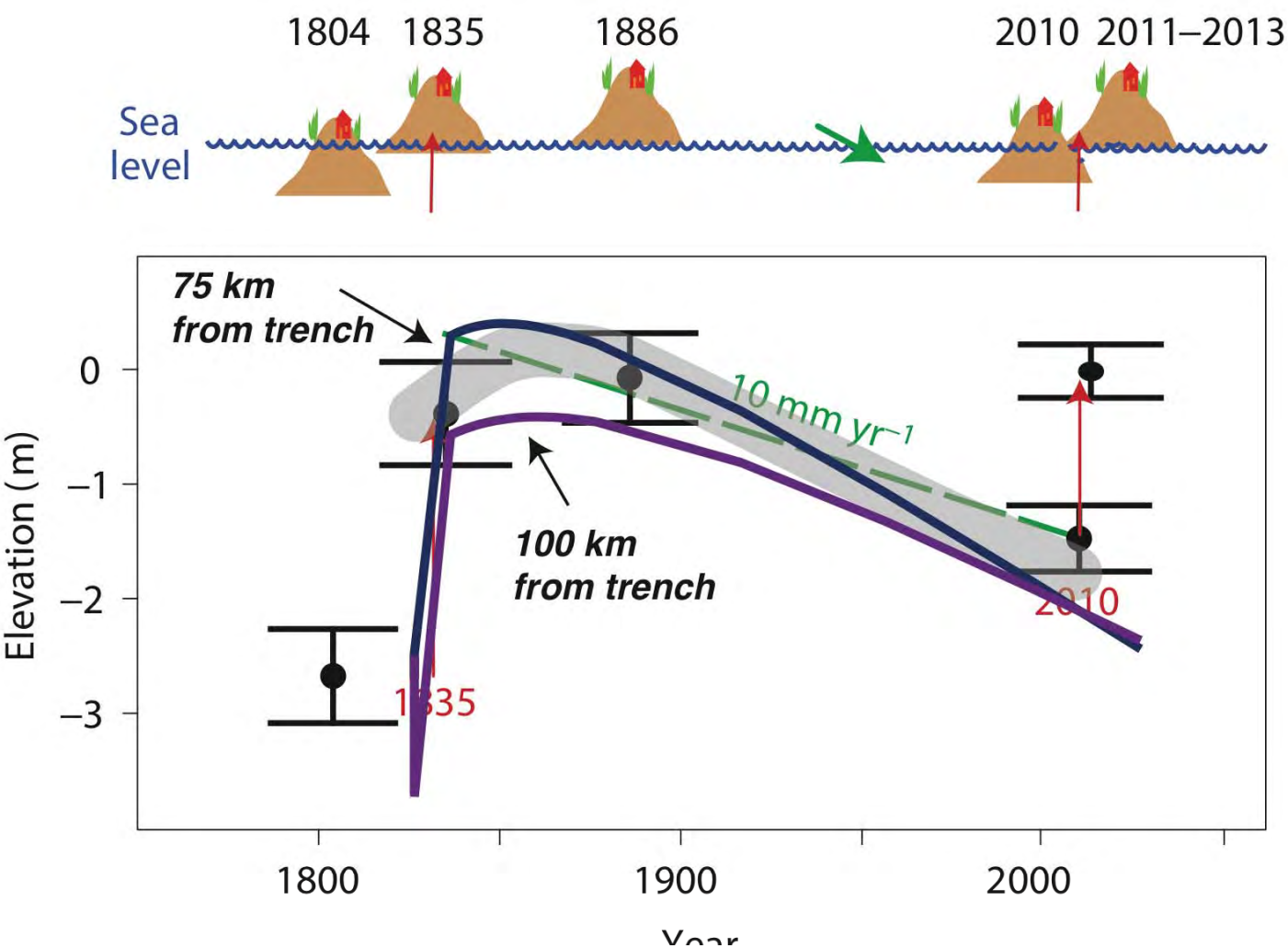
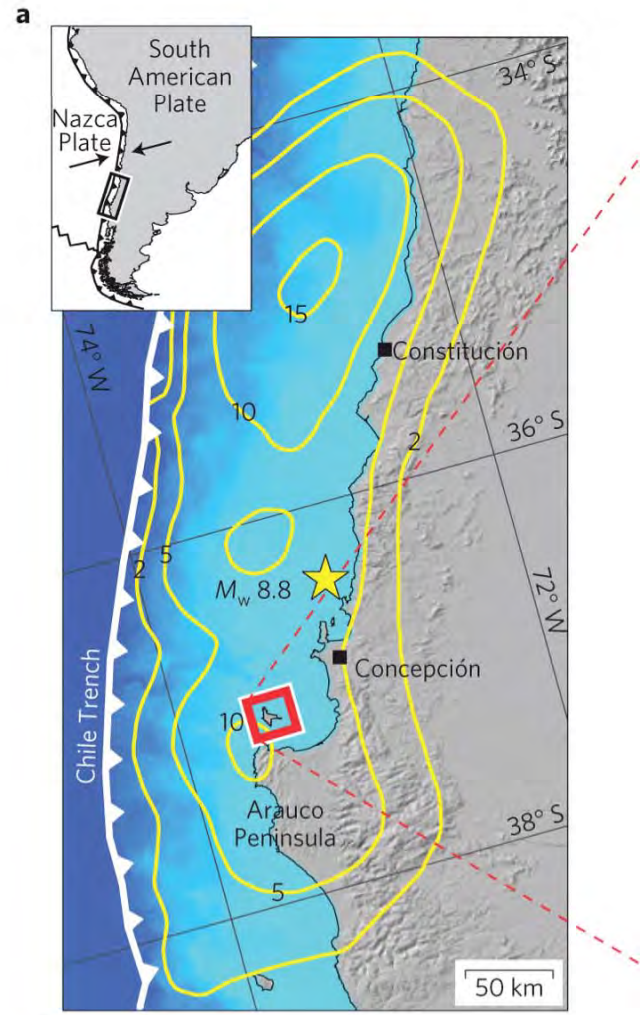
——————————Act 3 ——————-—
Summary/Conclusions (key points) [1-2 slides]

History of Vertical Motion at Isla Santa Maria
Consistent with Model Results





———————Act 3 ———————-—

Structure of Your Presentation

Summary Conclusions

- Key point(s) - elaborate orally
- Do NOT read your summary slide to audience
- Place your work in context - problems solved, future work, etc.
- Finish on a strong point - don’t fade away

——————————Act 1 ——————-—
Title Slide (including authors, affiliations) [1 slide]
Motivation (questions, observations, etc.) [1-2 slides]
Background (what is necessary for audience) [2-3 slides]
——————————Act 2 ——————-—
Analyses/Data/Models… (your work!) [3-4 slides]
Interpretations (remember your motivation) [~2 slides]
——————————Act 3 ——————-—
Summary/Conclusions (key points) [1-2 slides]

What are we Learning about Megathrust Earthquakes

What are we learning about Earthquakes:

1. There is a Diversity of behaviors for great megathrust EQs

2. Substantial interaction between upper and lower plates throughout the EQ Cycle

3. Observed deformation signal (Geodesy, etc.) produced by super-position of multiple processes

2010 Mw 8.8 MAULE CHILE EARTHQUAKE

NOW - Planning and Making Each Slide

Each slide has a purpose

Relevant “eye candy” is OK, but in moderation - don’t use clip art!

Use simple, clean fonts - keep them large
!!Know your Venue!!

58 Point Helvetica

50 Point Helvetica

32 Point Helvetica

22 Point Helvetica

Use Color effectively

RED *BLUE*

YELLOW *GREEN*

WHITE *PINK*

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WHITE	*PINK*

Planning Each Slide

Some “Obvious” things to consider

Detailed Tables are Problematic - are there more effective ways to show your results

use large tables to show scope of your data/sampling
Never be in a position where you say
“ I know you can’t read this, but…”

TABLE 1. K-Ar AGES OF UPPER OLIGOCENE TO LOWER MIOCENE VOLCANIC ROCKS IN COASTAL CALIFORNIA

Symbol	Volcanic-rock–bearing unit	N*	Age mean† (Ma)	Age range best estimates§ (Ma)	Age range with uncertainties# (Ma)	References
Iv	Iverson Basalt	3	24	23–25	22–26	Turner (1970)
Pe	Pescadero volcanics	1	22	N.A.	21–23	Stanley (1987)
Mi	Mindego Volcanics	1	23.5	N.A.	23–24	Turner (1970)
Cb	Carmel Bay basalt	2	27	27	26–28	Clark et al. (1984)
Za	Zayante Formation	3	22	21.5–23.5	20–25	Sims (1993)
Te	Tecuya Formation	4	22.5	22–23	21.5–23.5	Sims (1993)
	Za-Te combined**	7	22.5	21.5–23.5	20–25	
Pi	Pinnacles Volcanics	3	24	24–24.5	23.5–25.5	Sims (1993)
Lc	Lang Canyon volcanics	3	23	22–24	21–26	Sims (1993)
Ne	Neenach Volcanics	3	23	22.5–24	22–25	Sims (1993)
	Pi-Lc-Ne combined**	9	23.5	22–24.5	21–26	
Mb	Morro Bay–Islay Hill plugs	?	25	23–27	22–28	Greenhaus and Cox (1979)
Pc	Pine Creek lava	1	26.5	N.A.	26–27	Vedder et al. (1991)
Si	Simmler Formation	2	23	23–23.5	22–24	Ballance et al. (1983)
Pr	Plush Ranch Formation	5	24.5	23–26.5	23–27	Frizzell and Weigand (1993)
Va	Vasquez Formation	3	24.5	23.5–25.5	23–26	Frizzell and Weigand (1993)
Di	Diligencia Formation	6	22.5	21.5–23.5	21–24	Frizzell and Weigand (1993)
Tu	“Tunis Volcanics”†† (Tecuya Fm. member)	1	22.5	N.A.	22–23	Goodman et al. (1989) Goodman and Malin (1992)
	Net	~45	~23.5	22–27	20–28	

Notes: All ages given to nearest 0.5 Ma. Volcanic fields listed north to south. N.A. = not available.
*Number of radiometric dates judged reliable.
†Mean of N best estimates of age.
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**Segments of single offset volcanic fields.
††Whole-rock $^{40}Ar/^{39}Ar$ age.

TABLE 2. K-Ar AGES OF MID-MIOCENE VOLCANIC ROCKS IN COASTAL CALIFORNIA

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Tm	Tehachapi Mountains volcanics	?	17	16–18	?	Goodman et al. (1989) Goodman and Malin (1992)
Ot	Obispo Tuff	6	16	15.5–17	15–17.5	Turner (1970)
Lo	Lospe Formation**	N.A.	17.5	N.A.	N.A.	Cole and Basu (1995)
Tr	Tranquillon Volcanics	3	17	16.5–17.5	16–18.5	Turner (1970)
Ca	Caliente Formation (“triple basalts”)	3	15	14.5–16.5	14–18	Turner (1970)
Su	Summerland tuff	2	17	16.5–17.5	16–18	Turner (1970)
Co	Conejo Volcanics	5	15	14.5–16	14–16.5	Turner and Campbell (1979)
Mo	El Modeno Volcanics	1	14	N.A.	12.5–15.5	Turner (1970)
Sr	Santa Cruz Island	3	16	16–16.5	15–17	Kamerling and Luyendyk (1985)
Sl	San Clemente Island	2	15.5	N.A.	15–16.5	Merifield et al. (1971)
Jv	Jacumba-Vallecitos volcanics	5	17.5	16–18.5	15–20	Gastil et al. (1979)
	Net	~30	~16	14.5–18.5	12.5–20	

Notes: All ages given to nearest 0.5 Ma. Volcanic fields listed north to south. N.A. = not available.
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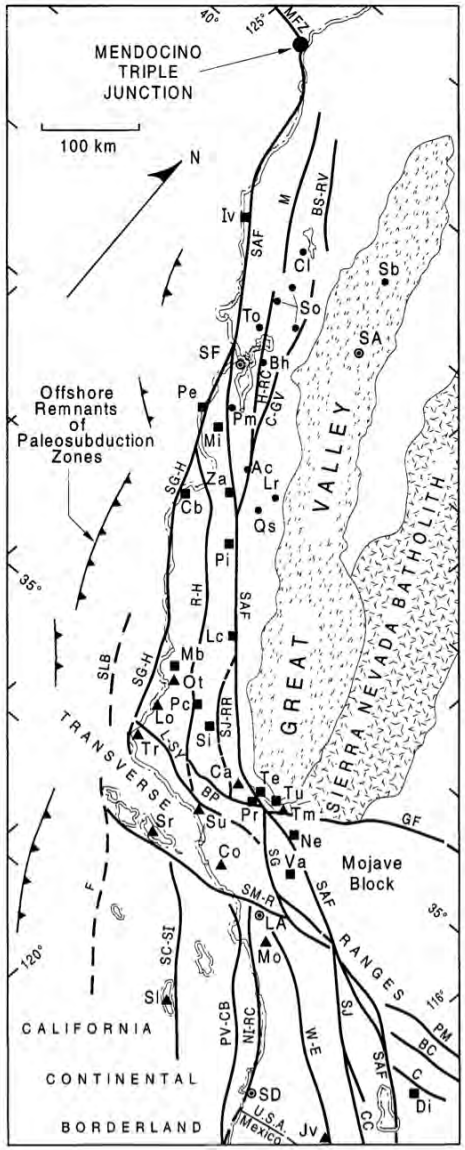

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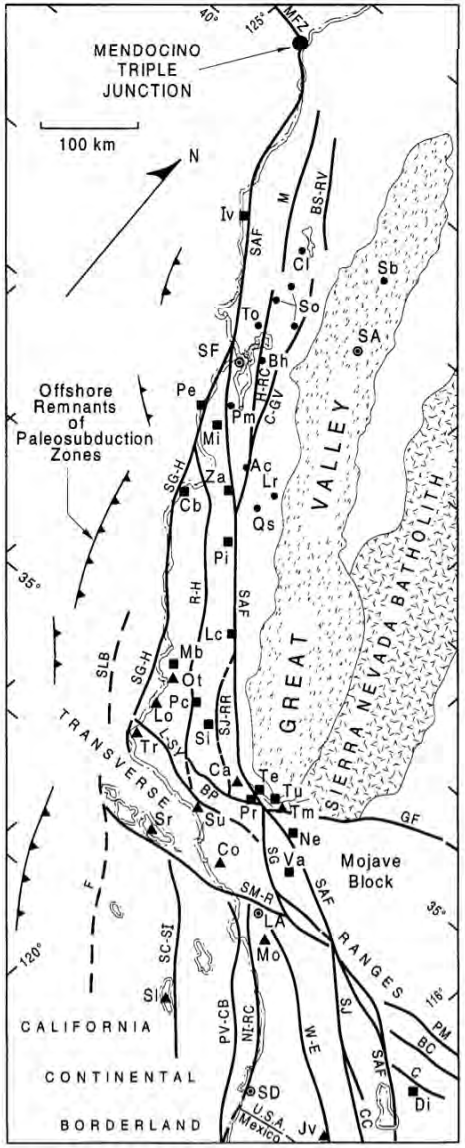
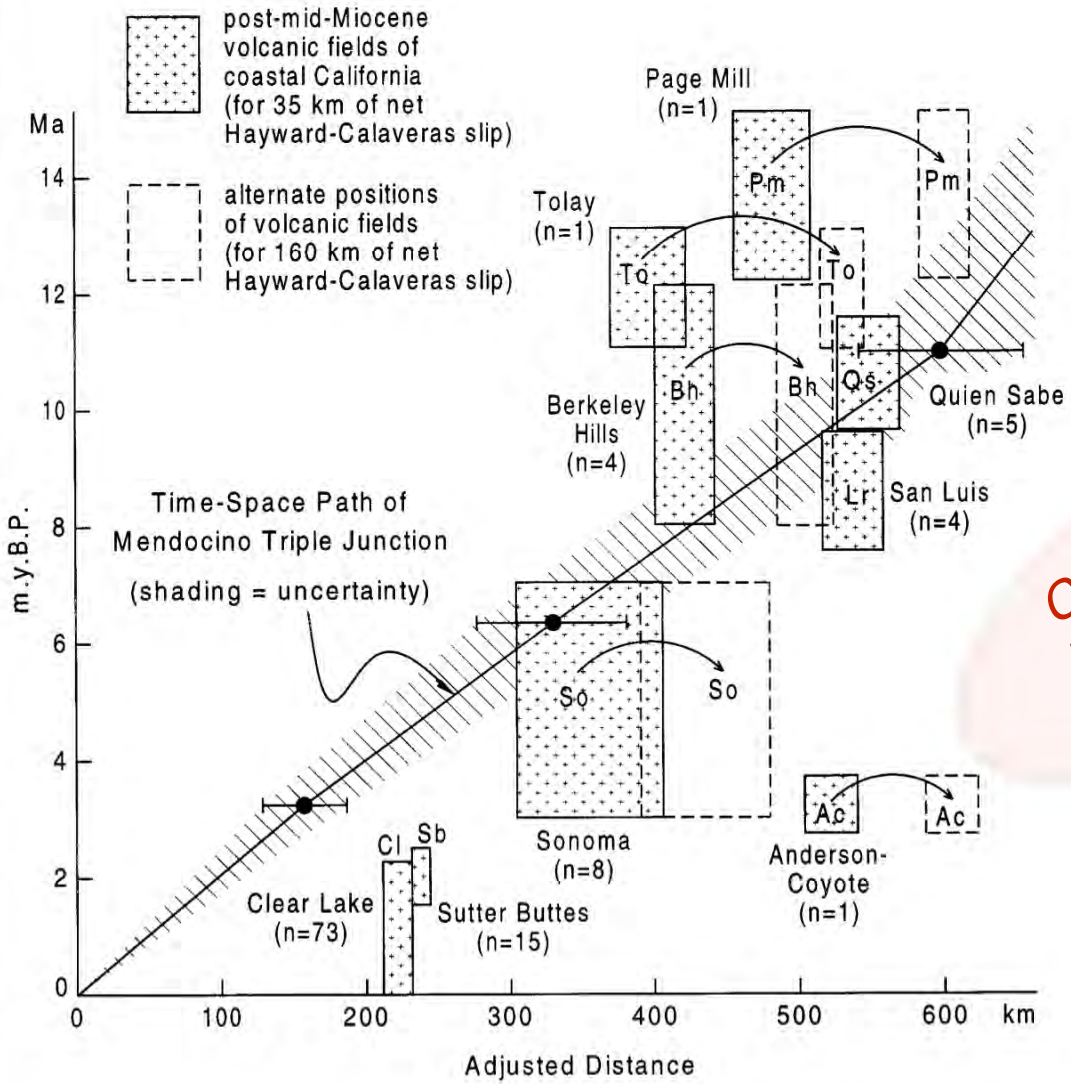
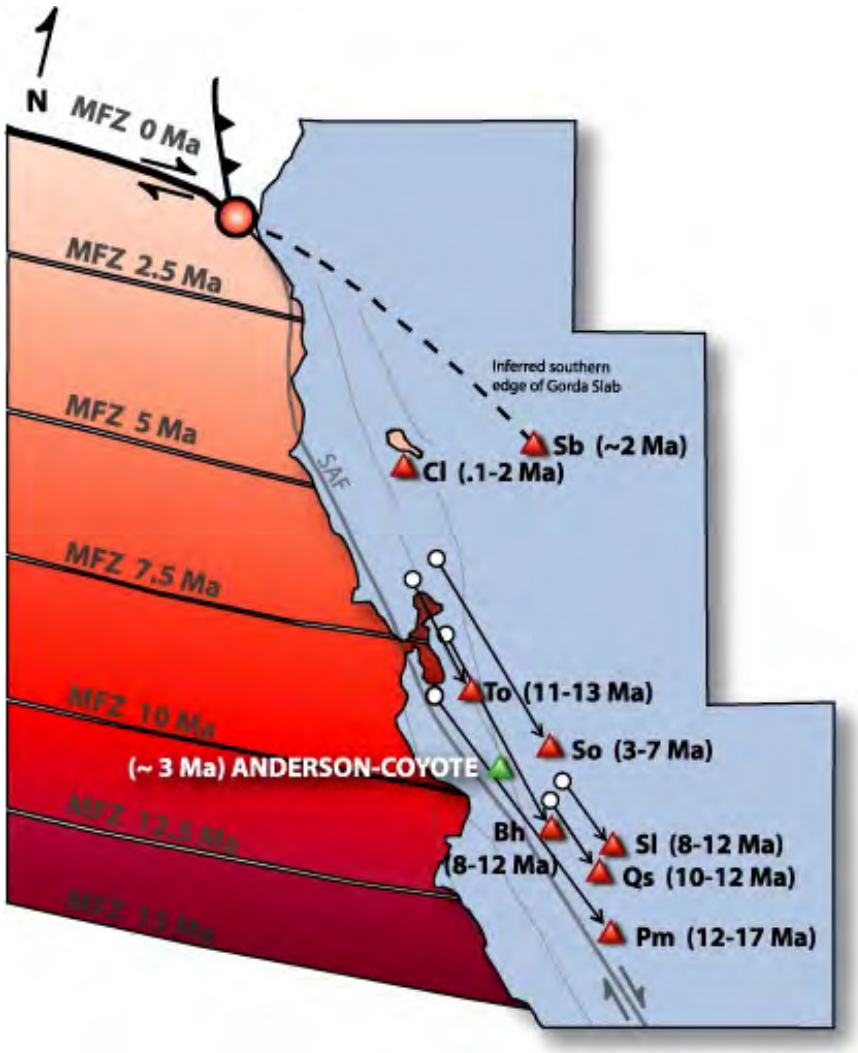
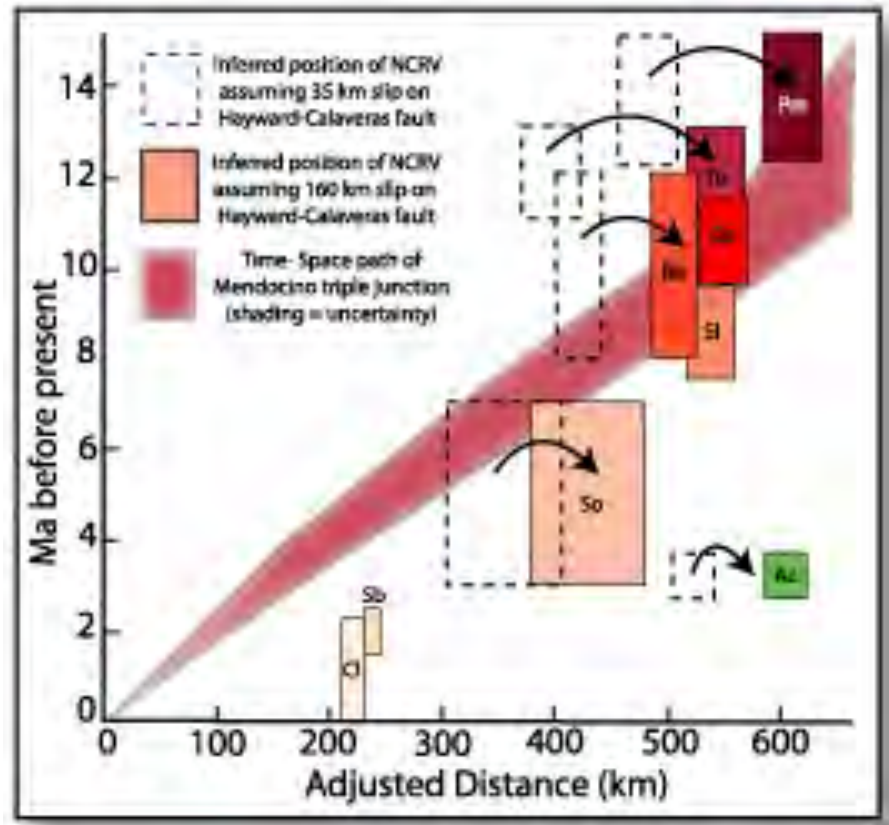




Consider Redrawing Figures to help make your points clear!





(modified from Dickinson, 1997)

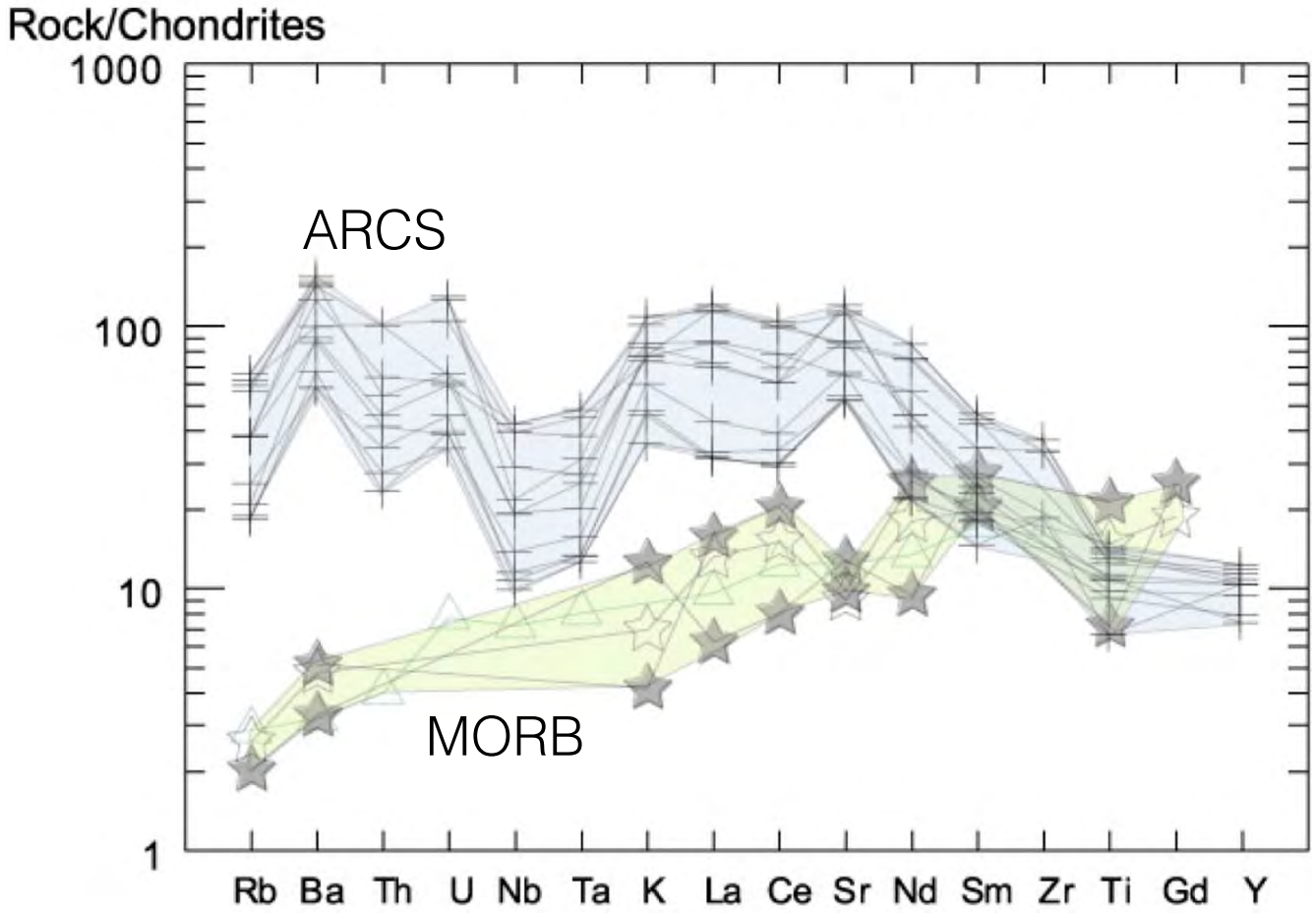
CURRENT & RECONSTRUCTED NCRV POSITIONS

Planning Each Slide

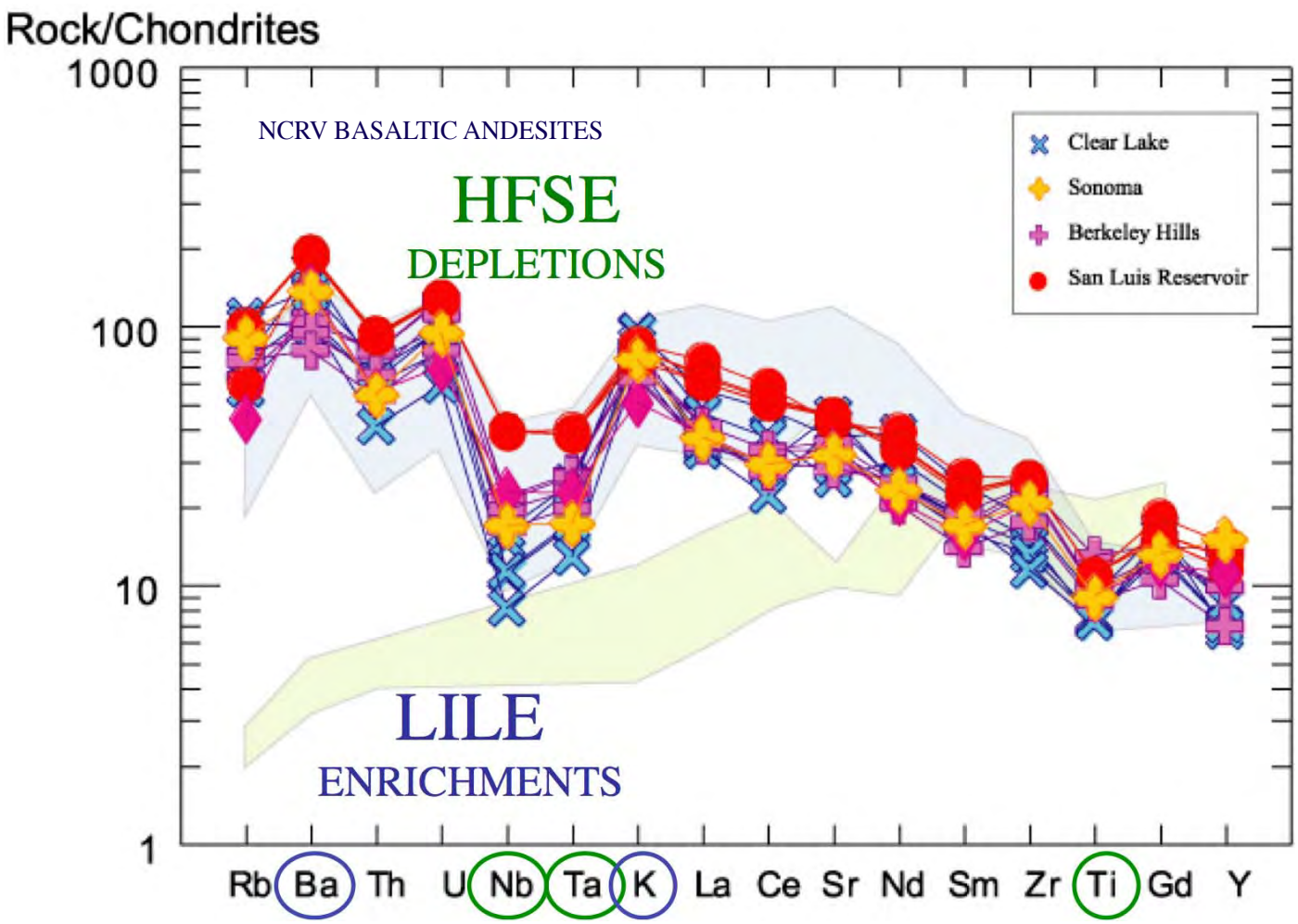
Some “Obvious” things to consider

Detailed Tables are Problematic - are there more effective ways to show your results

Make plots/graphs accessible to your audience



(Chondrites: Sun, 1980, MORB: Kay, 1970, Cascades: Conrey et al., 1997 & Bacon et al., 1997)


Rock/Chondrites
1000
100
10
1
NCRV BASALTIC ANDESITES
HFSE
DEPLETIONS
LILE
ENRICHMENTS
Clear Lake
Sonoma
Berkeley Hills
San Luis Reservoir
Rb Ba Th U Nb Ta K La Ce Sr Nd Sm Zr Ti Gd Y

Planning Each Slide

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Detailed Tables are Problematic - are there more effective ways to show your results

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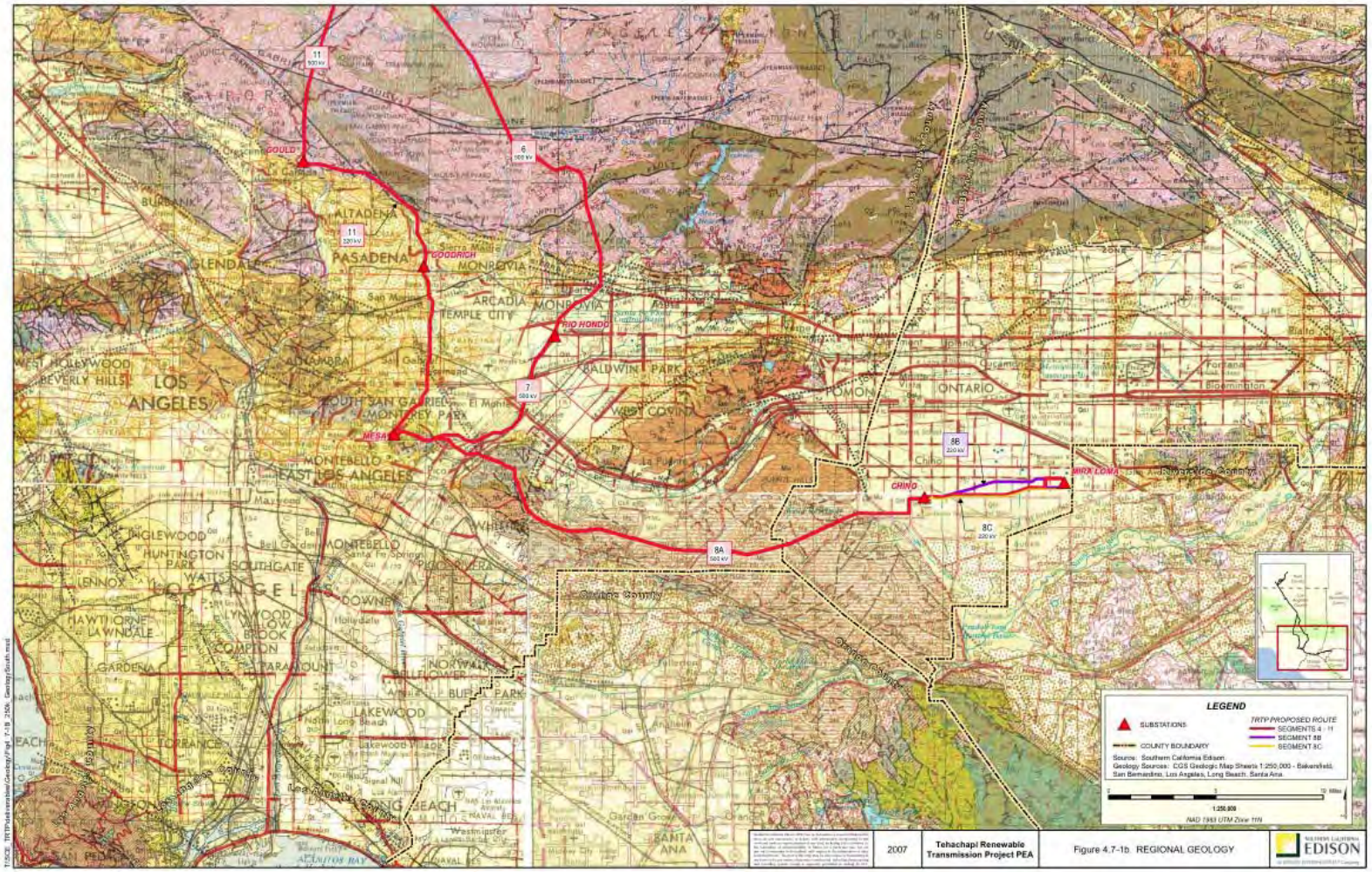
Detailed maps can be problematic


LEGEND
SUBSTATIONS
COUNTY BOUNDARY
TRTP PROPOSED ROUTE
SEGMENTS 4 - 11
SEGMENT 8B
SEGMENT 8C
Source: Southern California Edison
Geology Sources: CGS Geologic Map Sheets 1:250,000 - Bakersfield, San Bernardino, Los Angeles, Long Beach, Santa Ana
1:250,000
NAD 1983 UTM Zone 11N
GOULD
GOODRICH
RIO HONDO
MESA
CHINO
MIRA LOMA
11
6
7
8A
8B
8C
PASADENA
ALTADENA
GLENDALE
BURBANK
MONROVIA
ARCADIA
TEMPLE CITY
BALDWIN PARK
WEST COVINA
POMONA
ONTARIO
LOS ANGELES
EAST LOS ANGELES
MONTEBELLO
DOWNEY
NORWALK
LAKEWOOD
LONG BEACH
TORRANCE
GARDENA
COMPTON
INGLEWOOD
HUNTINGTON PARK
SOUTHGATE
LENNOX
HAWTHORNE
LAWNDALE
PARAMOUNT
BELLFLOWER
Orange County
Los Angeles County
San Bernardino County
Riverside County
SANTA ANA
Westminster
ALAMITOS BAY
Chino
Ontario
Rancho Cucamonga
Fontana
Bloomington
Rialto
Pomona
Montebello
Santa Fe Springs
Whittier
Bellflower
Norwalk
Lakewood
Long Beach
Signal Hill
Garden Grove
Orange
Tustin
Irvine
Mission Viejo
Laguna Niguel
Dana Point
Capistrano Beach
Pacific Ocean
Prado Flood Control Basin
Prado Park
Chino Hills State Park
Cucamonga-Guasti Regional Park
Santa Ana River
Los Angeles River
San Gabriel River
Rio Hondo
Coyote Creek
Alamitos Bay
Pacific Ocean
Pacific Ocean
Pacific Ocean

Don’t ANIMATE Text !!!

People will be distracted and not pay attention to anything you are saying

This is not the time to be cute!

Top 10 Slide Tips

1. *Keep It Simple*
2. *Limit Bullet Points and text*
3. *Limit Transitions and Builds (animation)*
4. *Use High-quality Graphics*
5. *Have a Visual Theme, but avoid using 'canned' templates*
6. *Use Appropriate Charts*
7. *Use Color Well*
8. *Choose your fonts well*
9. *Use Video or audio (if appropriate)*
10. *Spend time in the slide sorter*

What do Others Say ?

Garr Reynolds; corporate trainer

Tips for Effective Design of Powerpoint Presentations

#1 Have only the minimum required text on each slide

#2 Be consistent and sparing in your use of transitions and animations

#3 Be consistent in your choice of bullets, font, and colors

#4 Create graphics (tables/charts/maps) appropriately

#5 White space can be our friend

#6 Remember - you are the show, not the powerpoint slideshow

Luisa F. Castro, Univ. Hawaii

Do I Practice What I Preach?

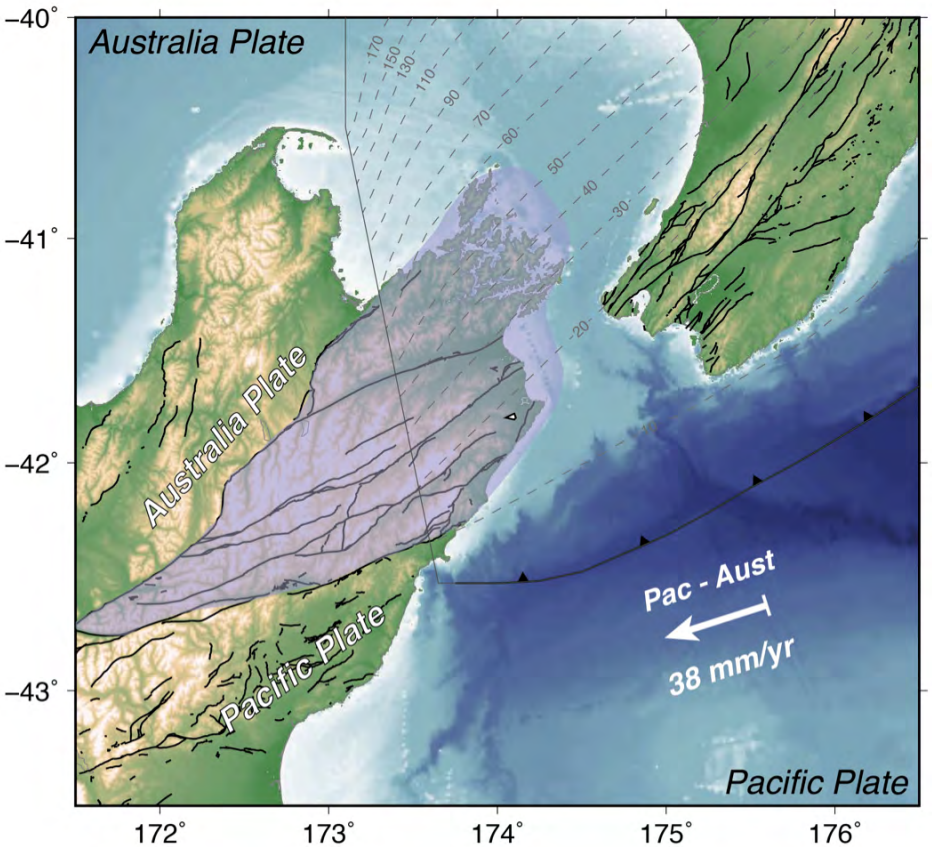
Hidden Earthquake Potential in Plate Boundary Transition Zones

Kevin P Furlong
Geodynamics Research Group
Geosciences
Penn State University

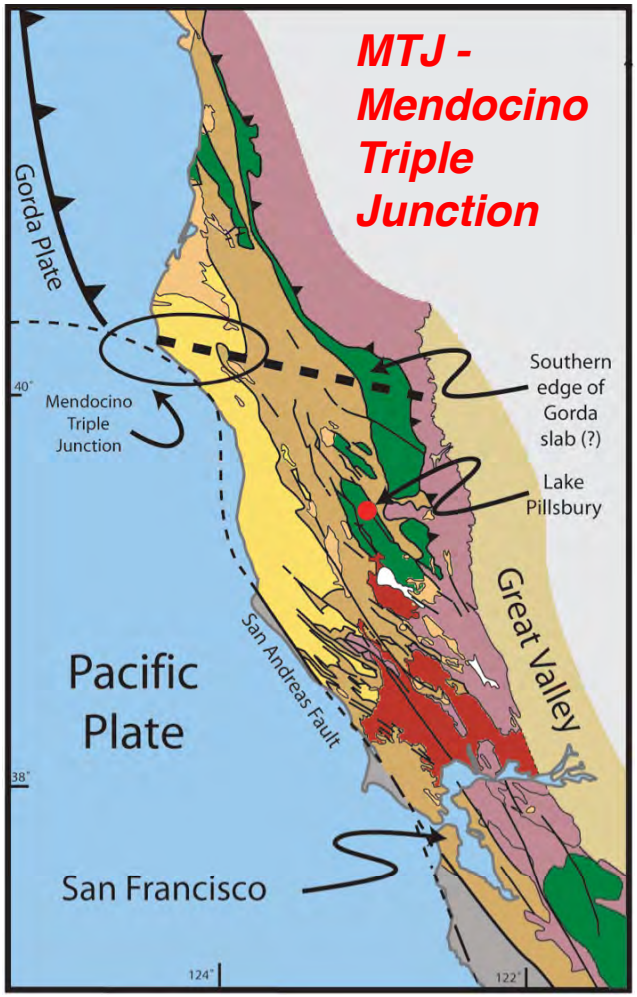
1. ***Transitions from Subduction to Translation produce composite patterns of crustal deformation***

2. ***Coupling models based on observations of surface displacements may underestimate slip deficit accumulation***

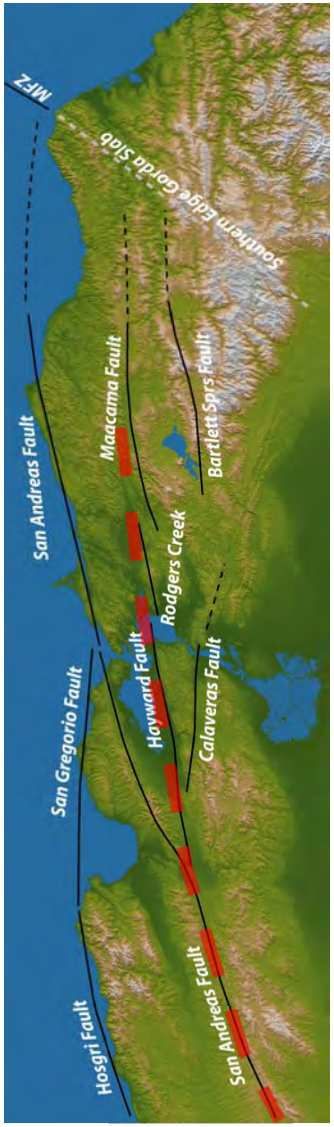
Plate Boundary Transitions from Subduction to Translation

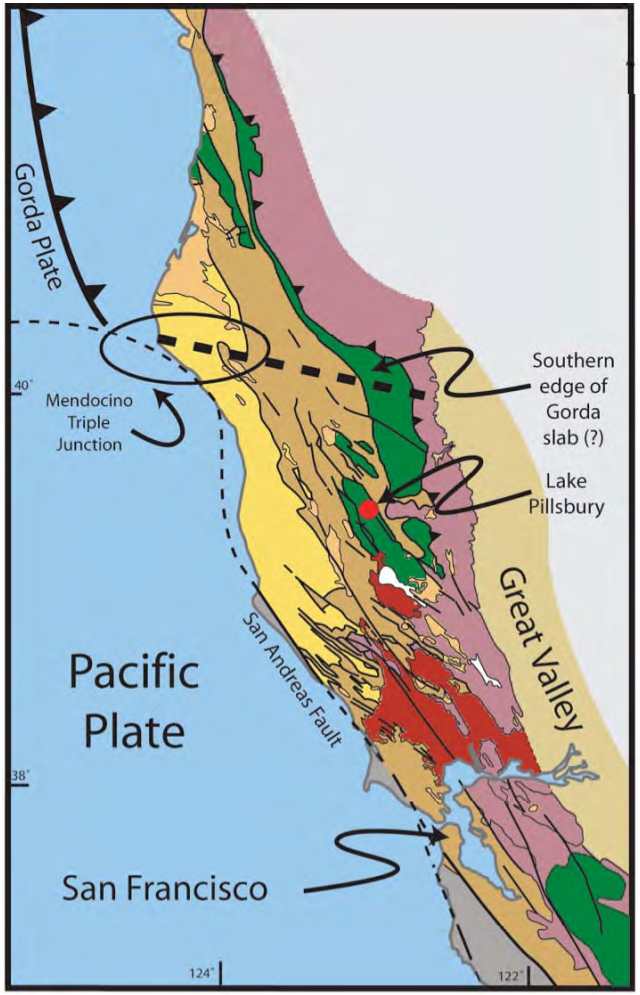


MFZ - Marlborough Fault Zone (Terrane transitional between Australia and Pacific plates)

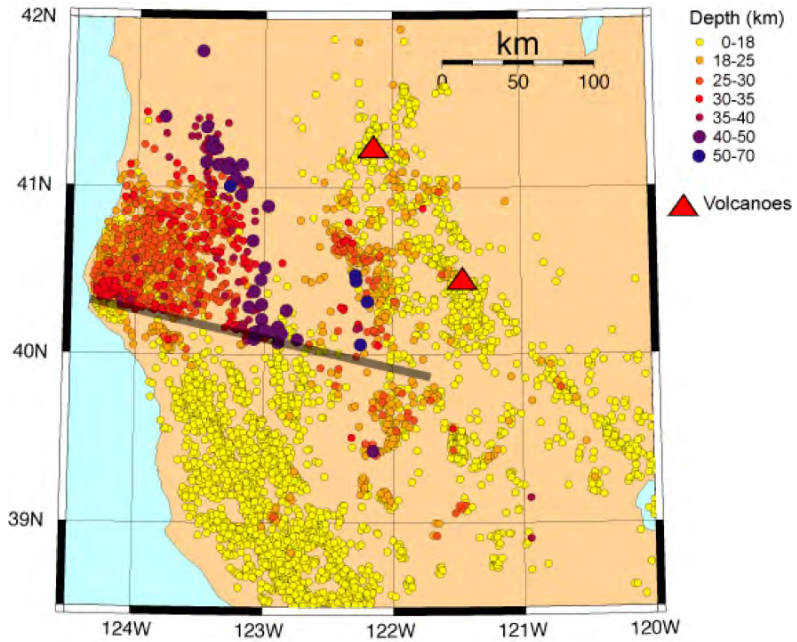


1. NZ Transition driven by change from Oceanic to Continental transpression
2. MTJ Transition at triple junction separating convergence from translation
3. Both scenarios include an abrupt end to subduction and a slab edge
4. One Observation but Two Unknowns





Fundamental Plate Boundary Transition from Subduction to Translation



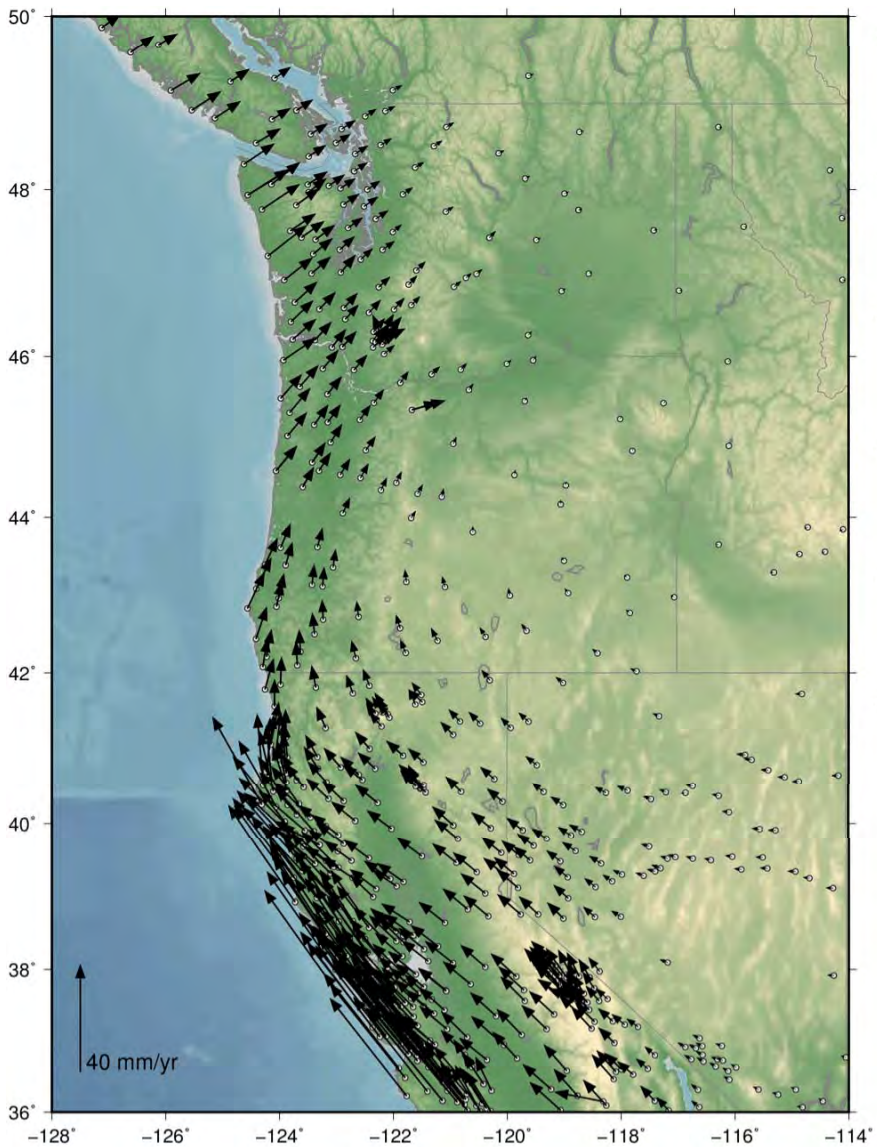
Abrupt transition in lithospheric mantle - southern end to Gorda subduction

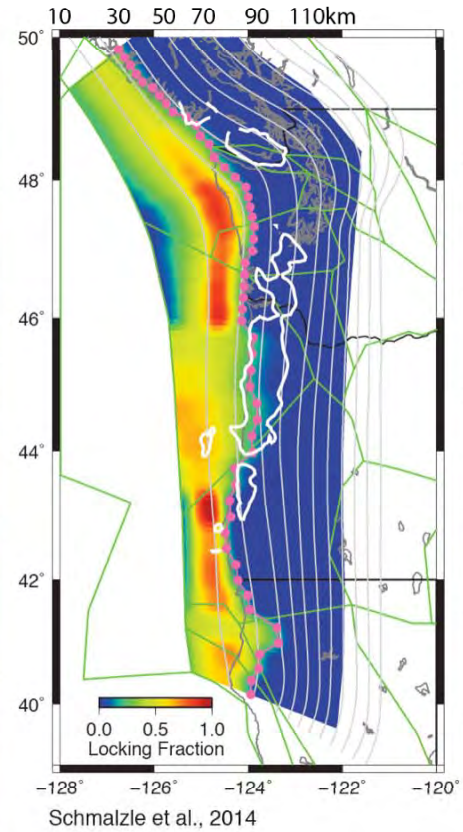
Plate boundary shear zone develops within crust/ lithosphere of North America

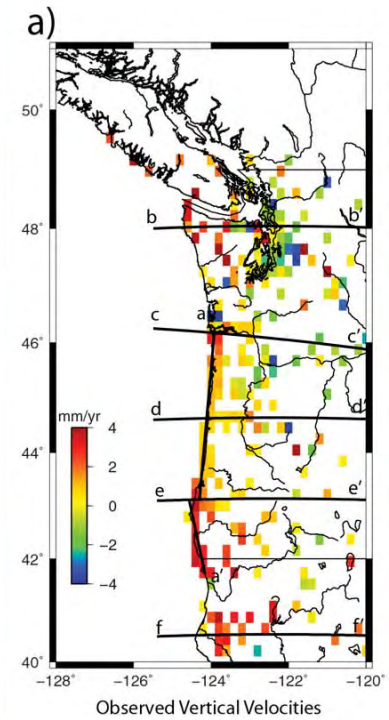
Subduction Coupling Signature

?

San Andreas Shear Signature





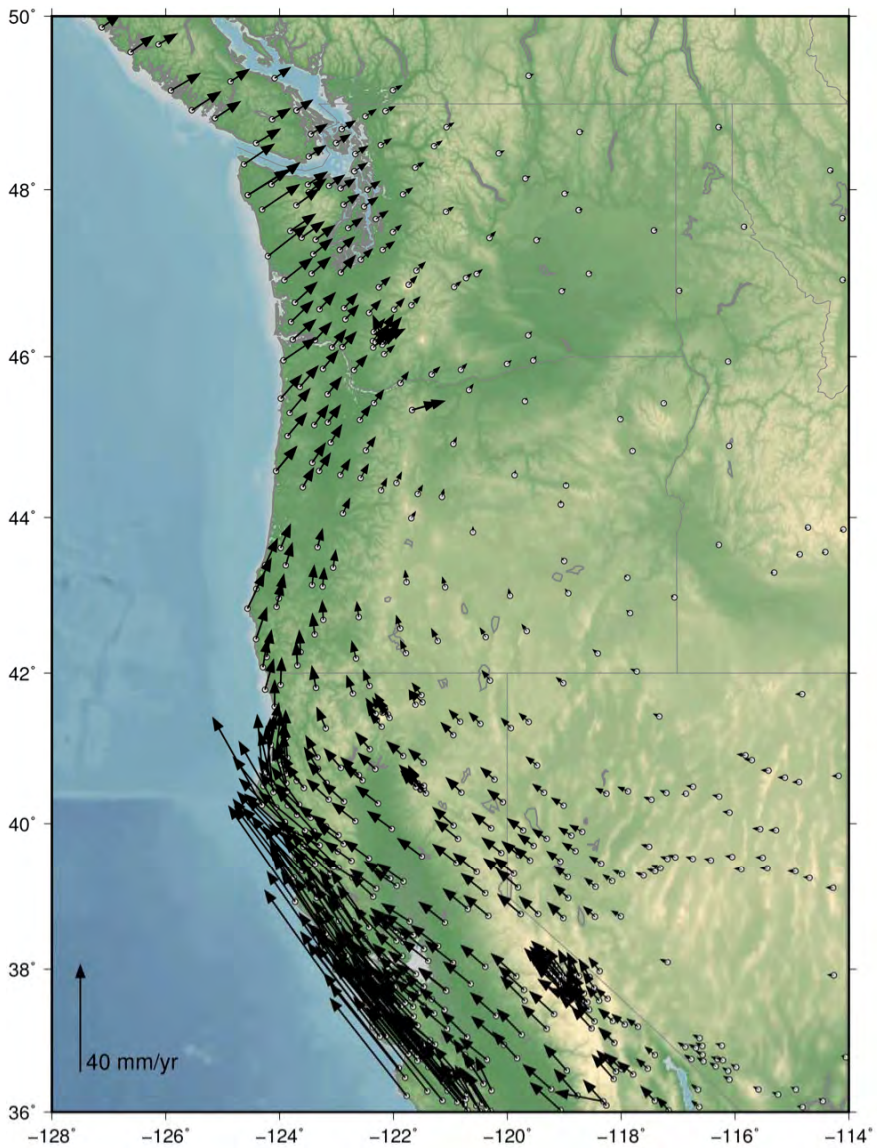


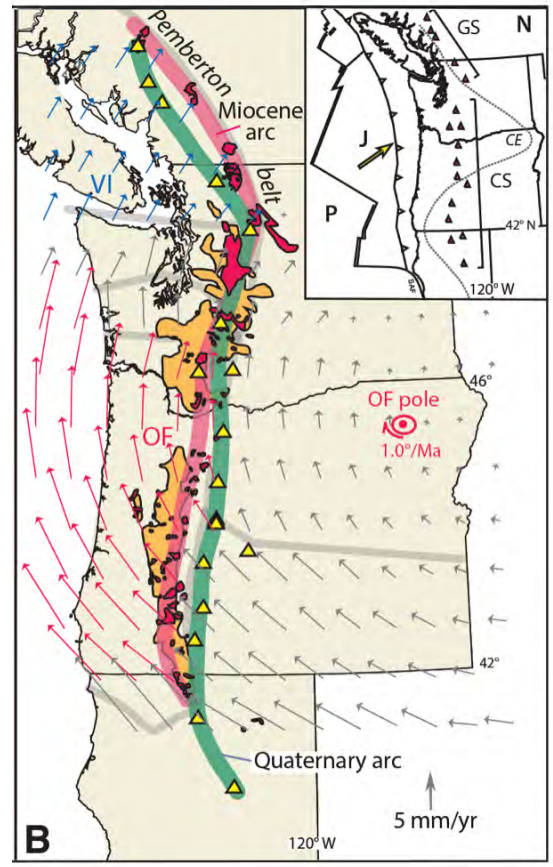
Coupling Model (Schmalzle et al., 2014) constrained by patterns of vertical motions

Subduction Coupling Signature

?

San Andreas Shear Signature

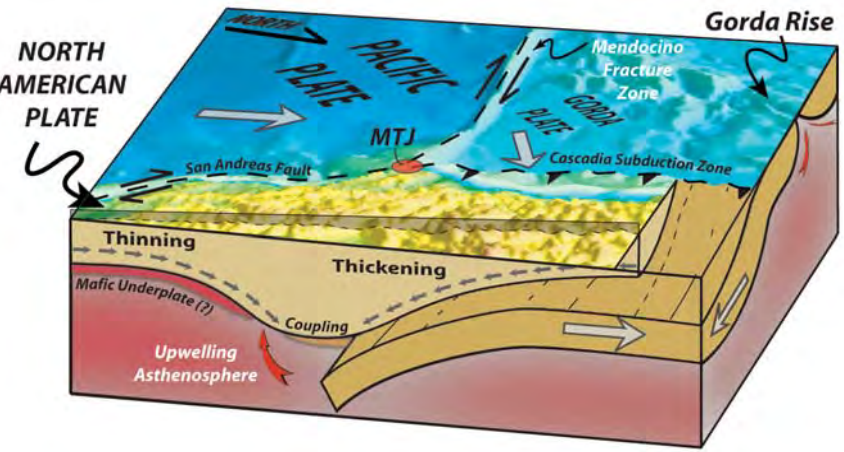


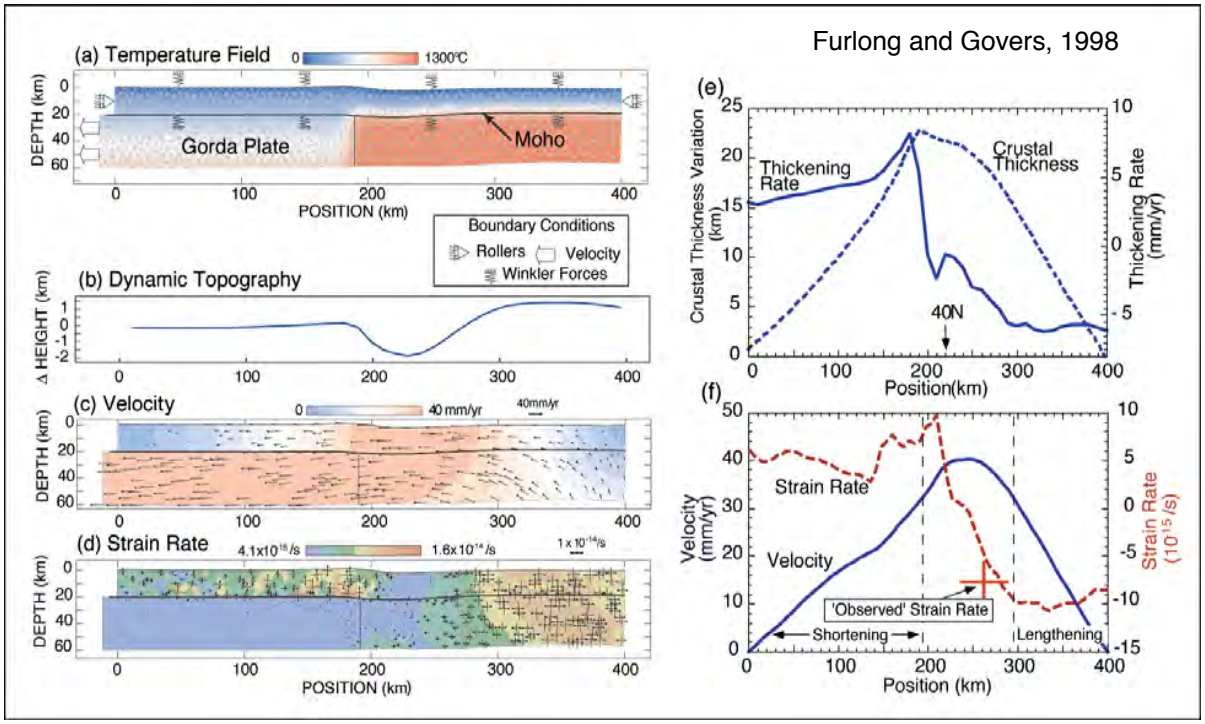


Wells and McCaffrey, 2013

Wells and McCaffrey (2013) argue for block rotation (implies minimal coupling)

FROM SLAB WINDOW TO THE MTJ CRUSTAL CONVEYOR:

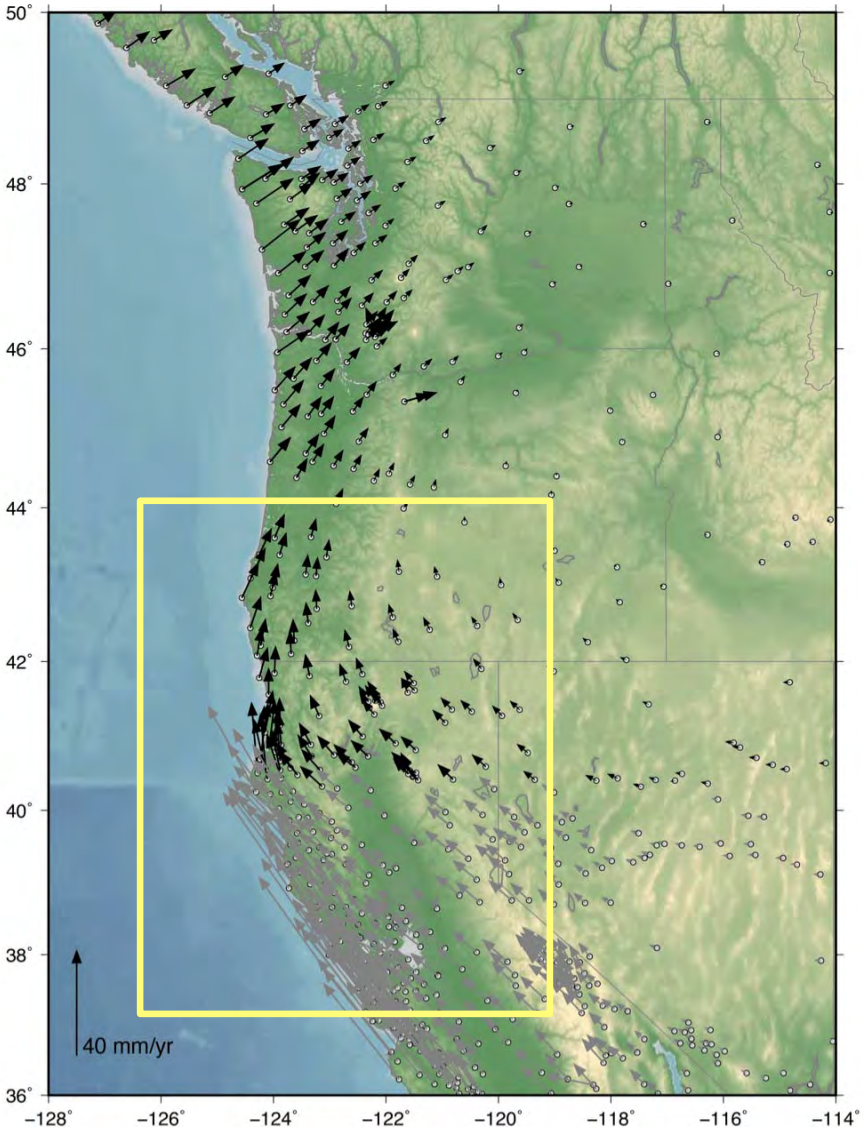




1. *North America not simply a passive participant in MTJ processes*
2. *SAF associated shear and crustal thickening extends north of the triple junction*
3. *The SAF deformation is superposed on Cascadia earthquake cycle processes*

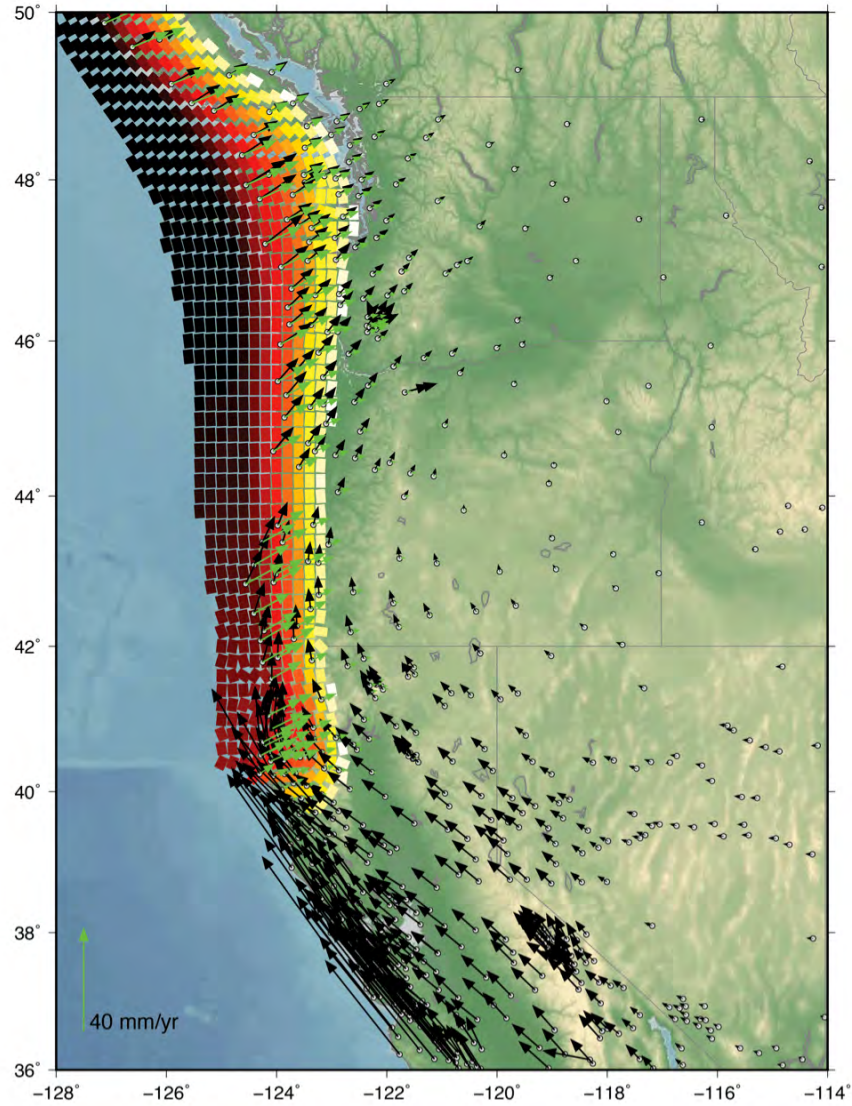
MTJ CC Model predictions of migrating crustal shortening /thickening process straddling the slab edge is consistent with crustal structure, heat flow, uplift,

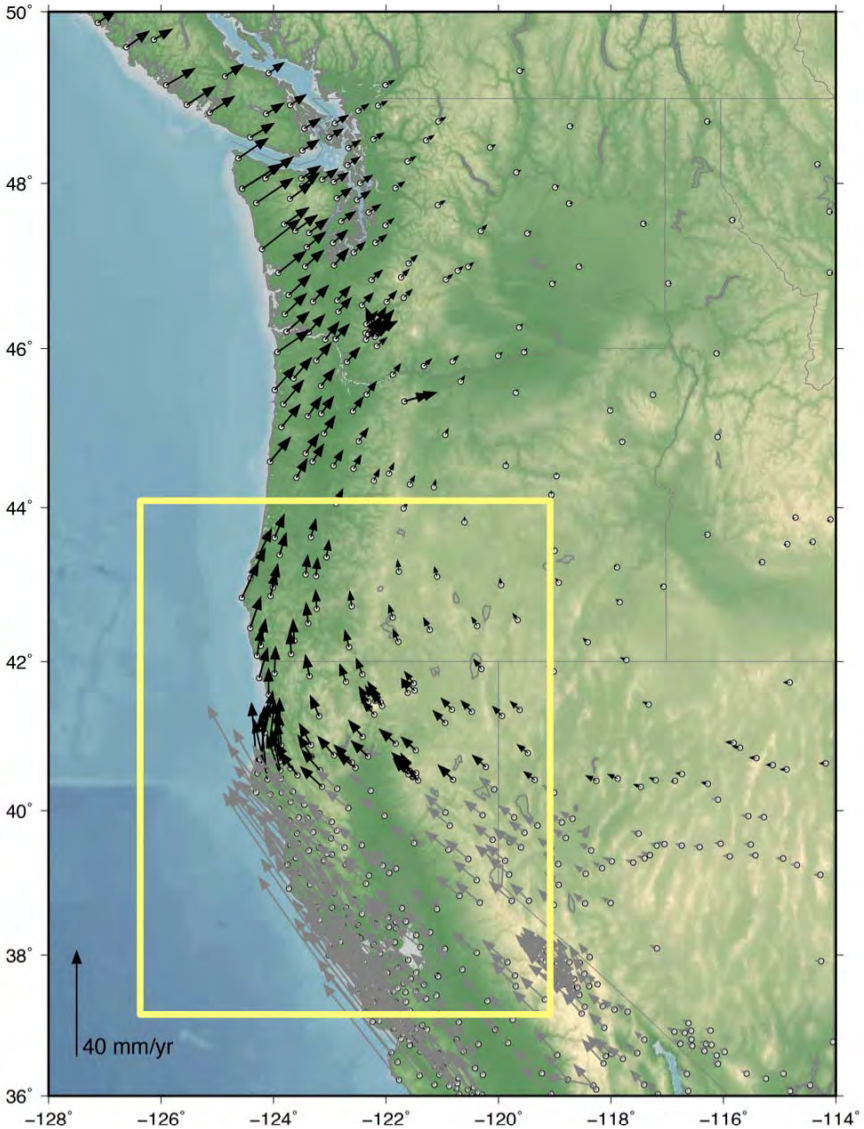
How far north of triple junction does this effect extend?



Apply Simple Subduction Coupling Model to region of Cascadia Subduction

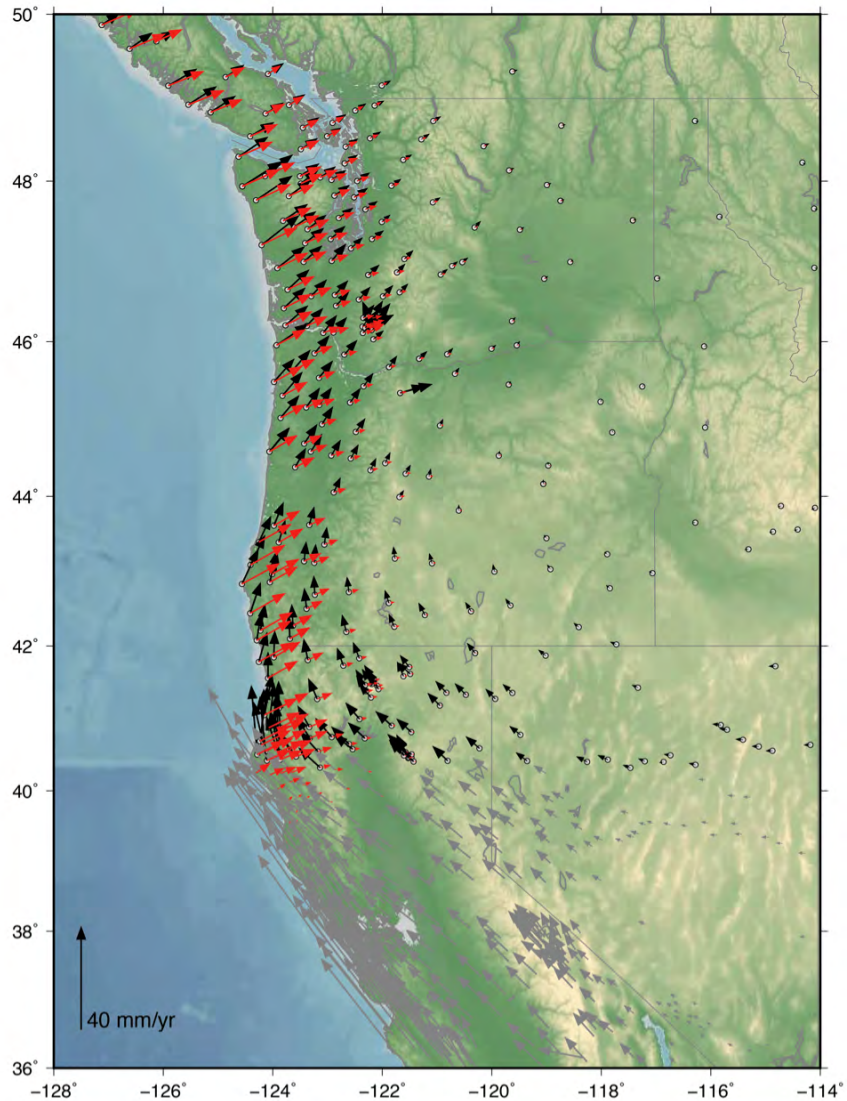
Residual Reflects MTJ CC Effects in GPS Signal (?)

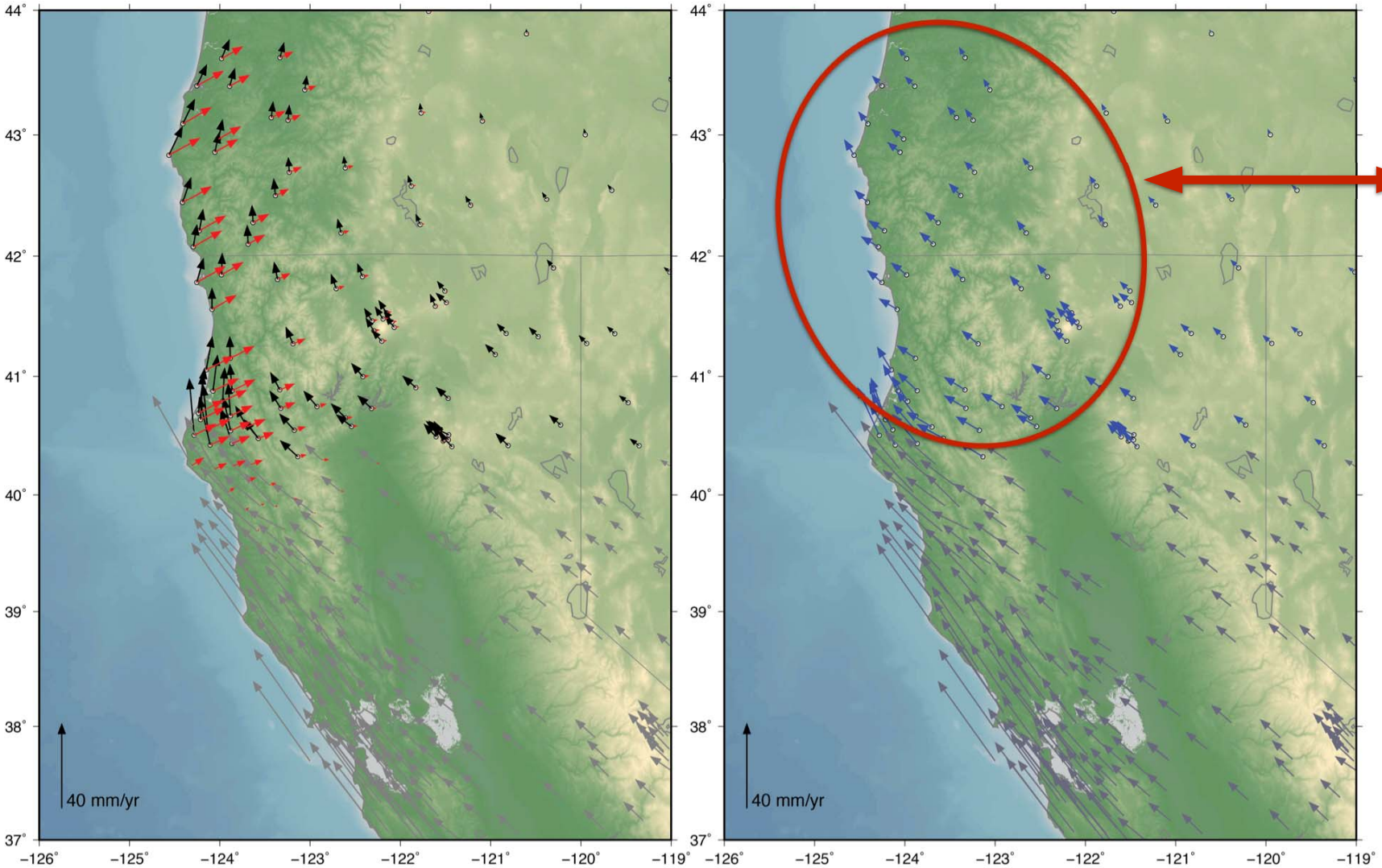




Apply Simple Subduction Coupling Model to region of Cascadia Subduction

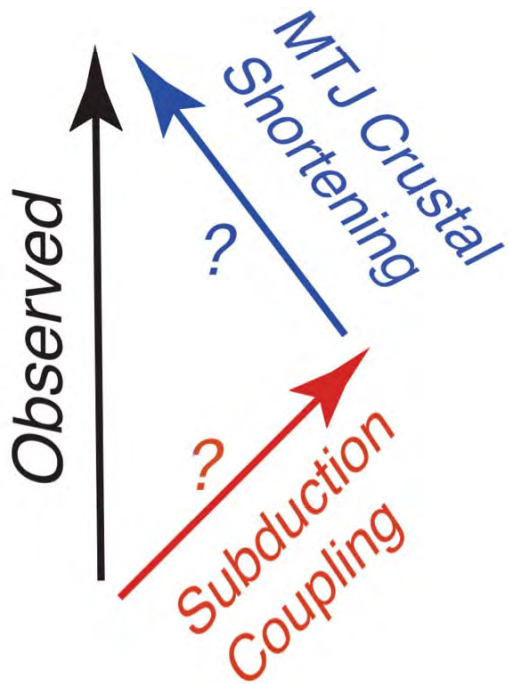
Residual Reflects MTJ CC Effects in GPS Signal (?)

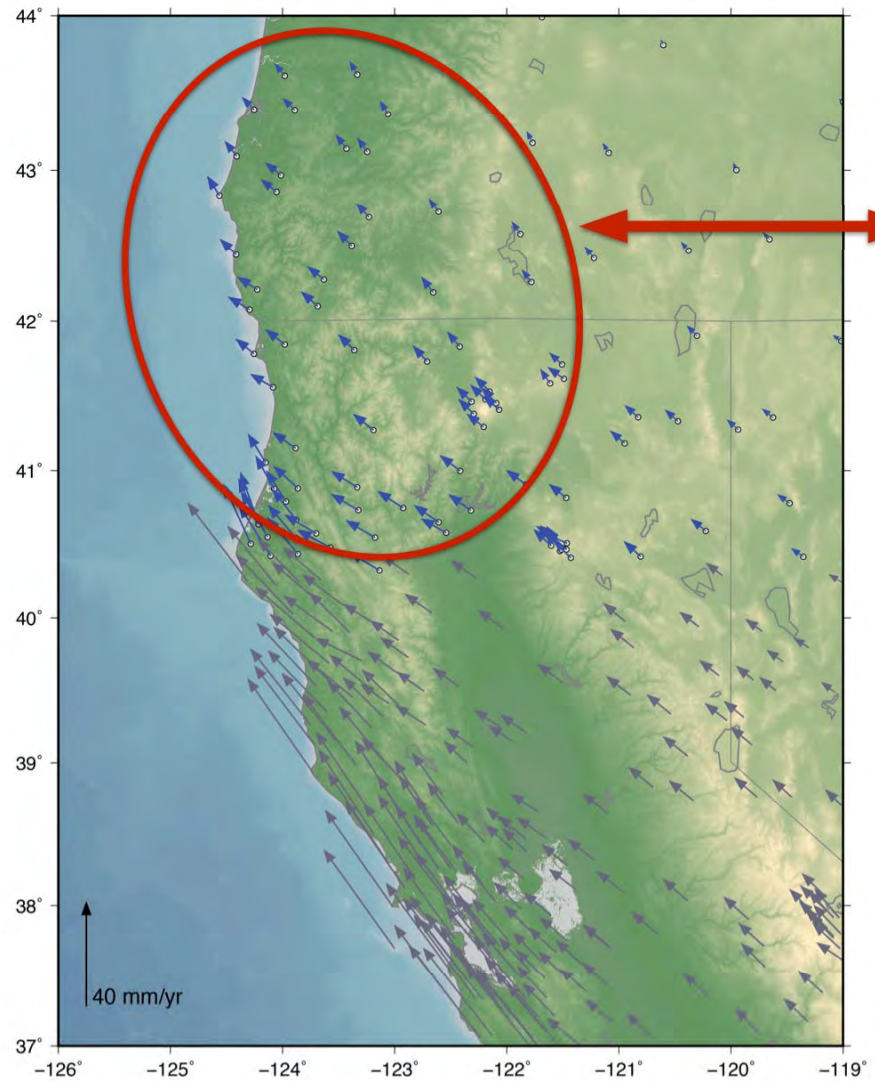




MTJ Signal Extends 200-300 km north of Triple Junction

Southern Cascadia Megathrust may be comparably coupled as northern sections





MTJ Signal Extends 200-300 km north of Triple Junction

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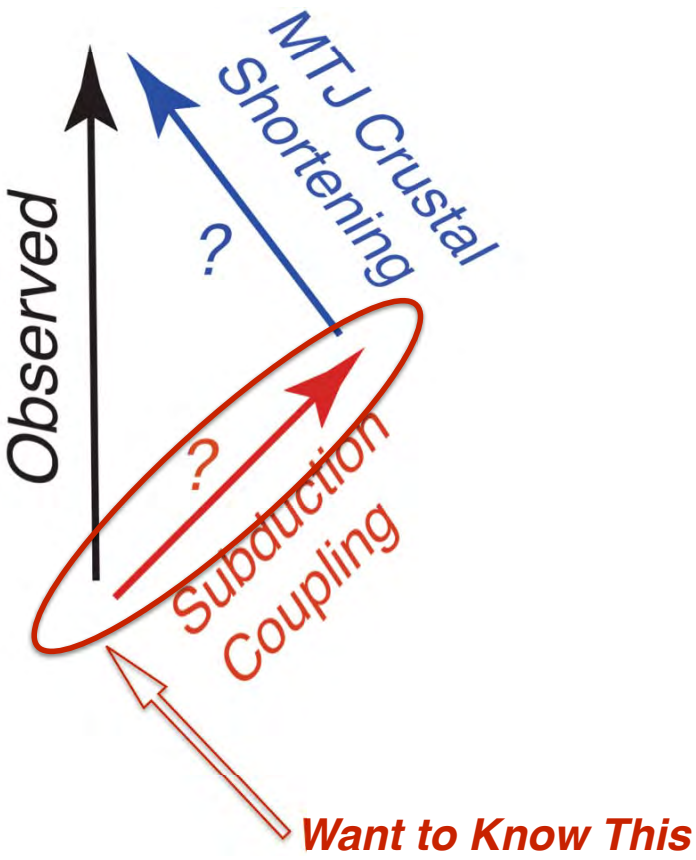
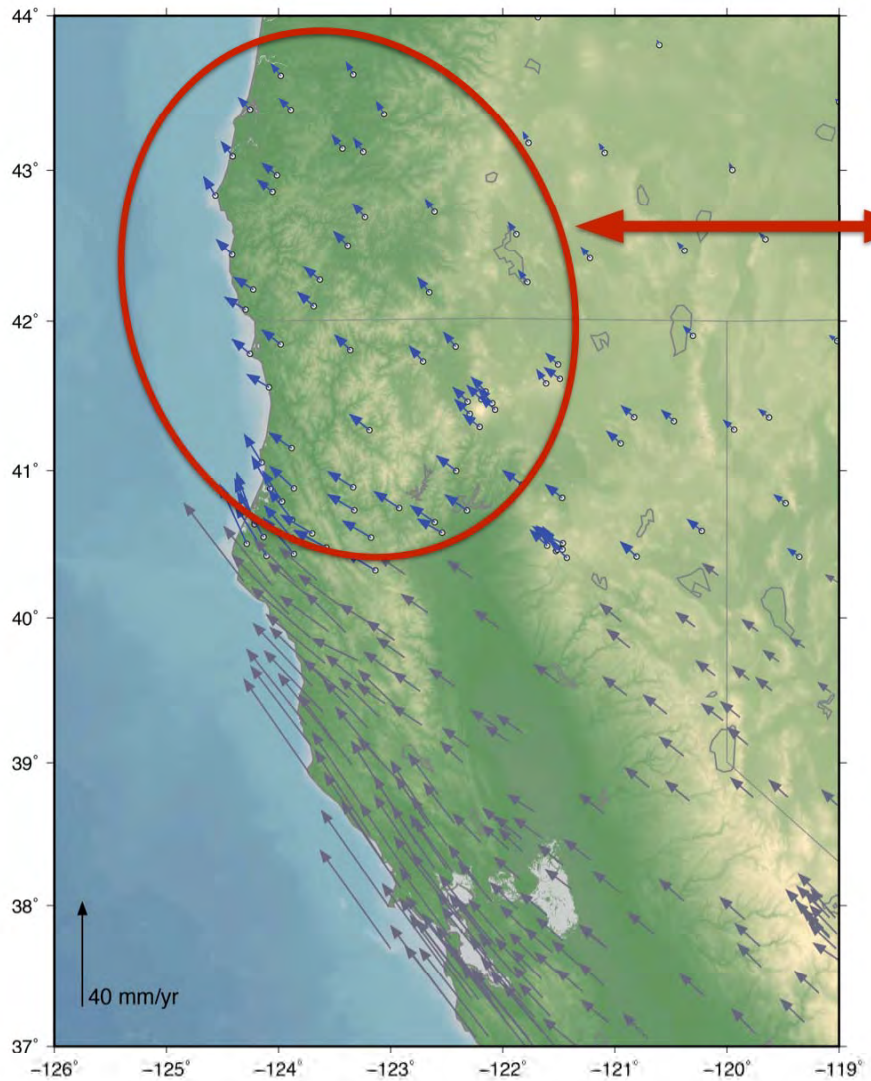
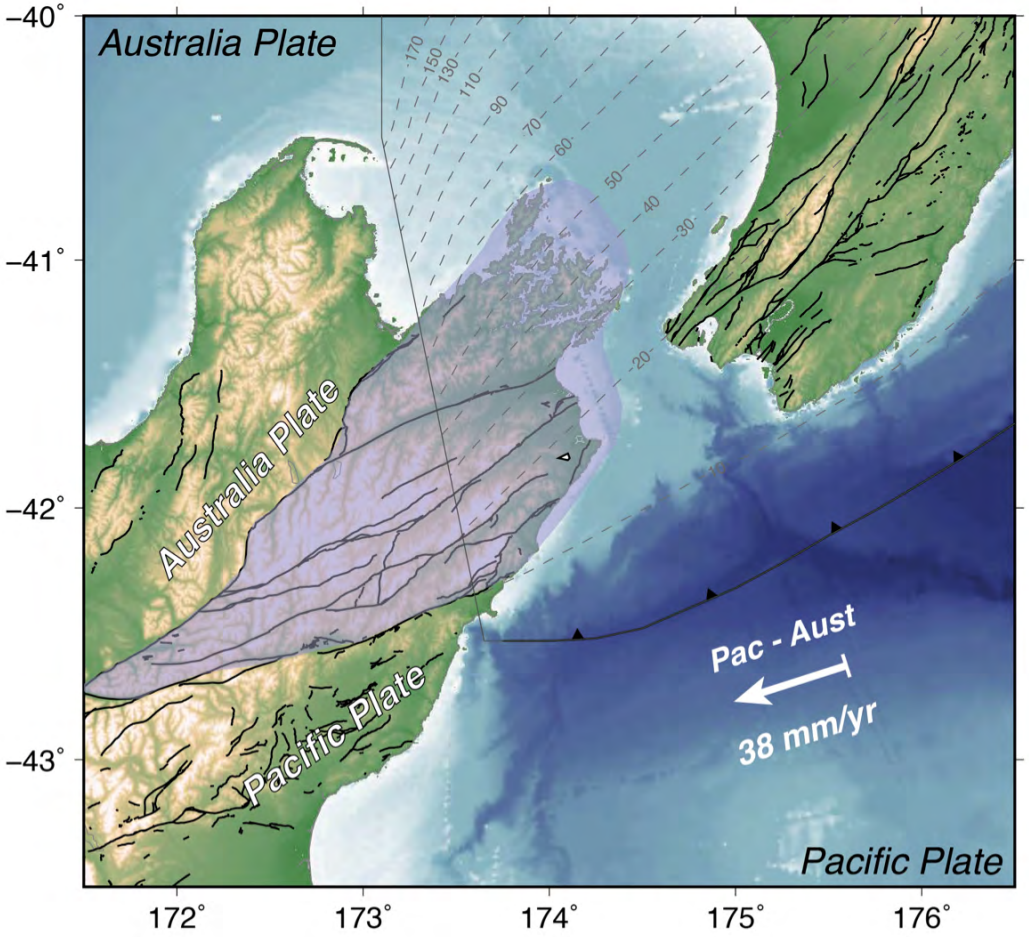




MTJ Signal Extends 200-300 km north of Triple Junction

Southern Cascadia Megathrust may be comparably coupled as northern sections

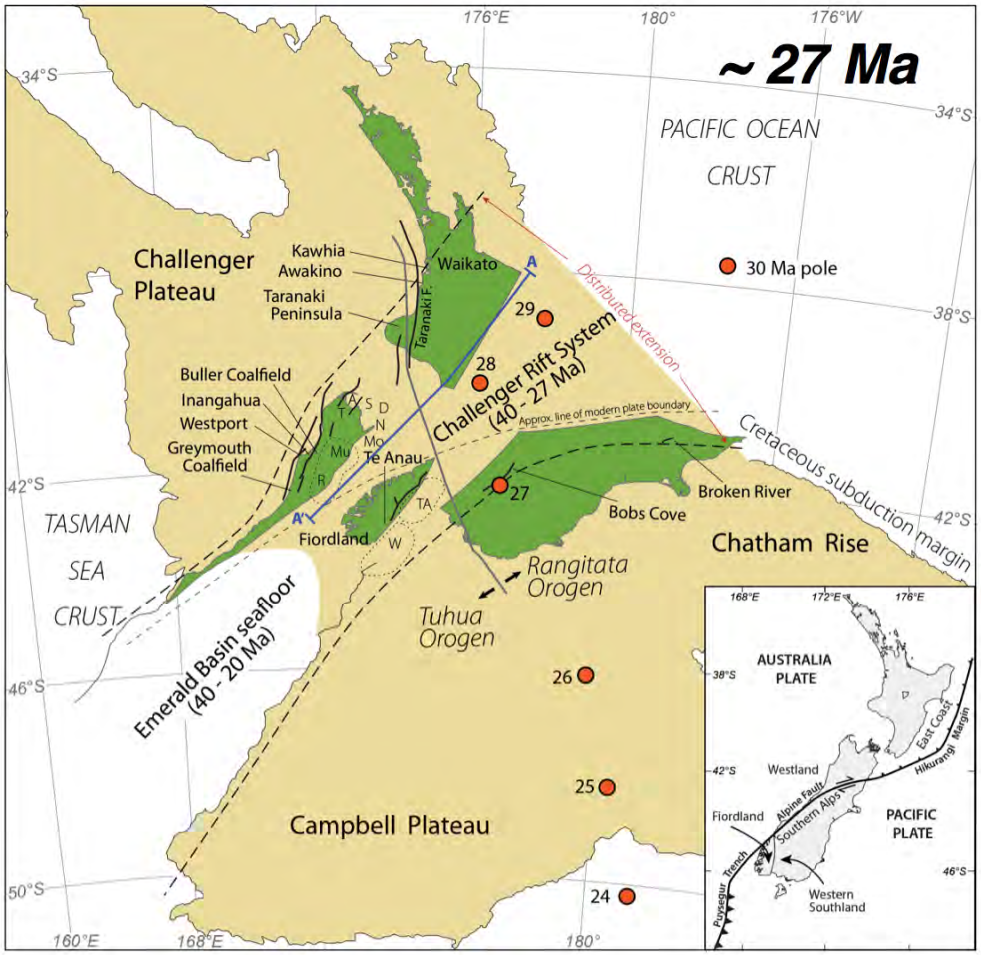
Transition from Subduction to Translation: Northern South Island, N.Z.



1. ***Pacific Subduction beneath an Upper Plate of uncertain affinity/kinematics at northern South Island***

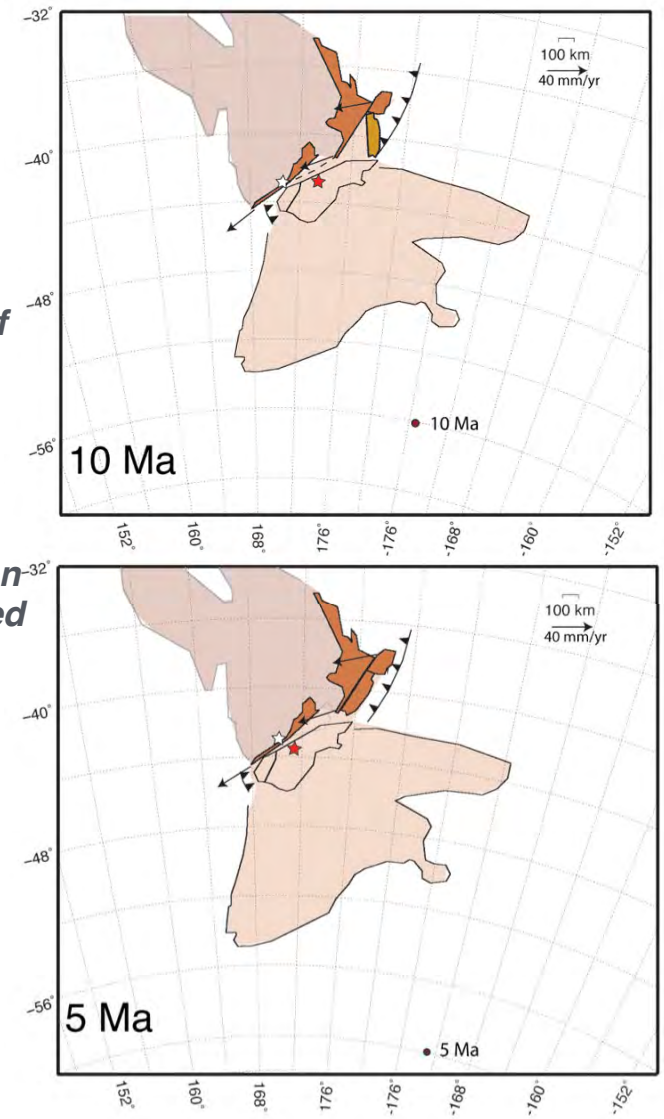
2. ***Slab edge extends obliquely across Marlborough Fault Zone terrane***

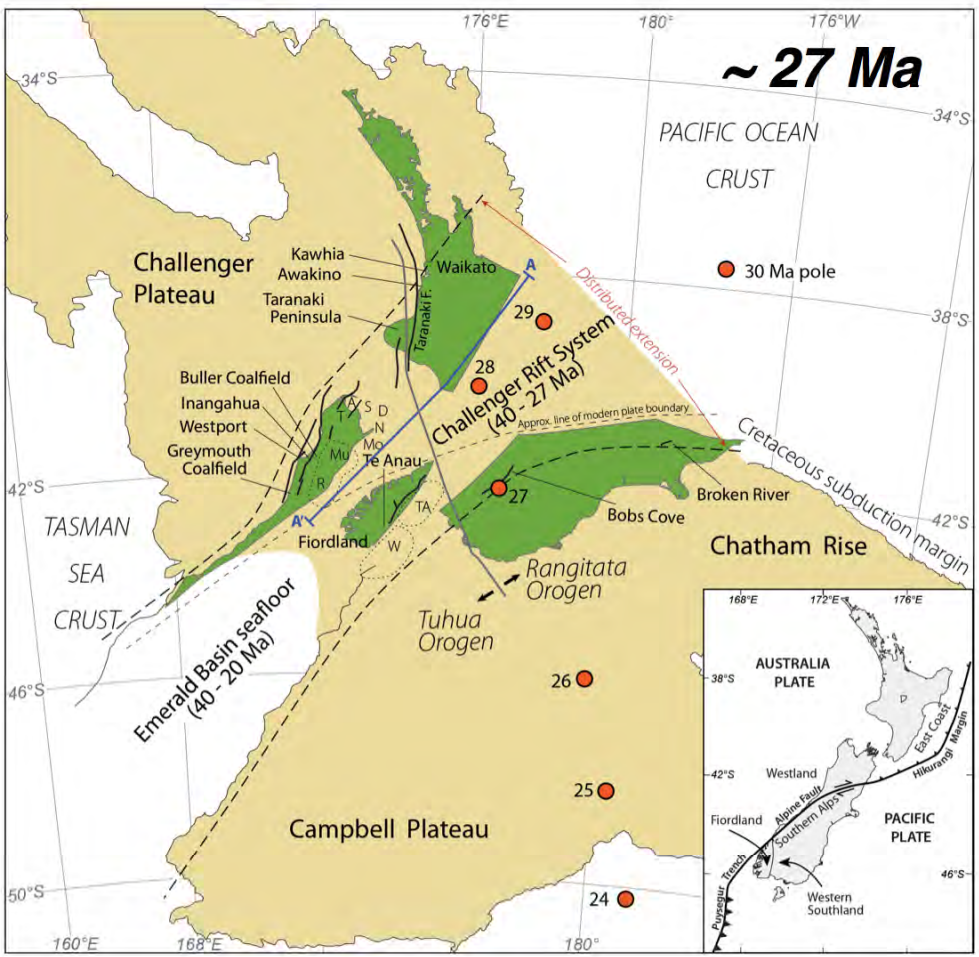
3. ***Transition 'stationary' with respect to South Island - tectonic history important to present-day plate configuration***

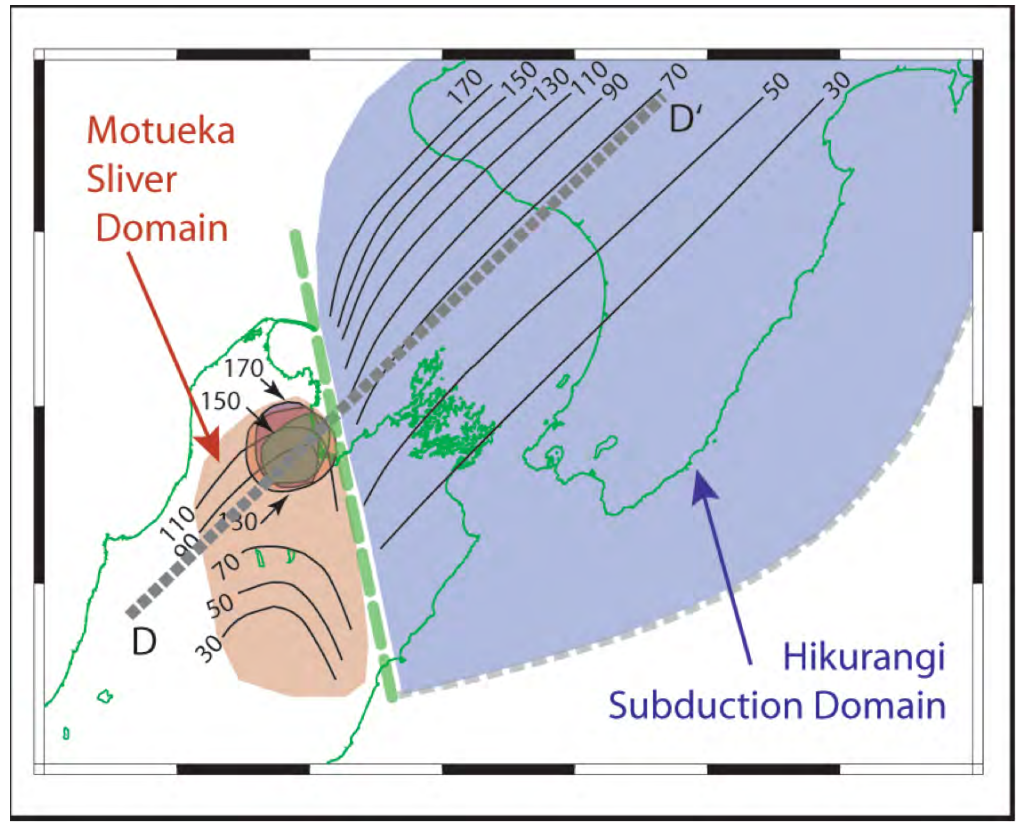


Furlong and Kamp, Tectonophysics, 2013

1. *On leading edge of Gondwana supercontinent*
2. *Since Oligocene has been site of evolving plate boundary transition*
3. *Slab edge anchored to oceanic -'continental' boundary*

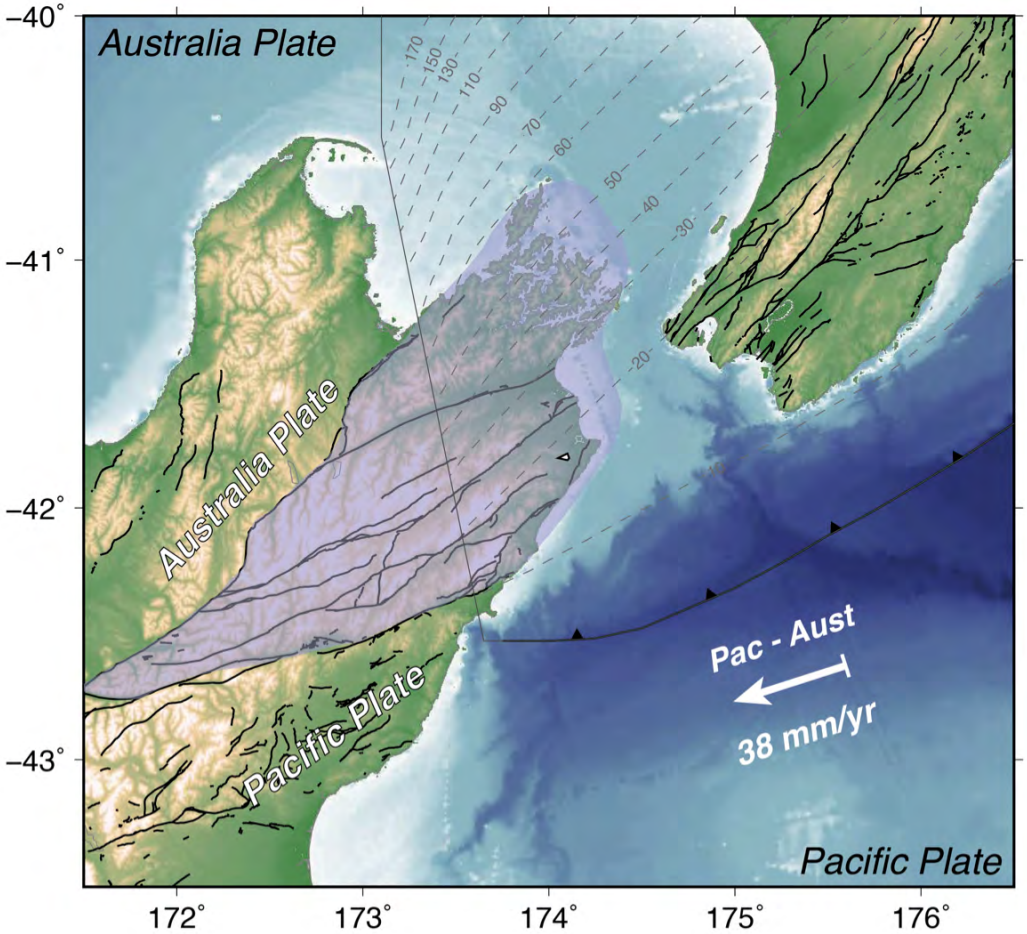


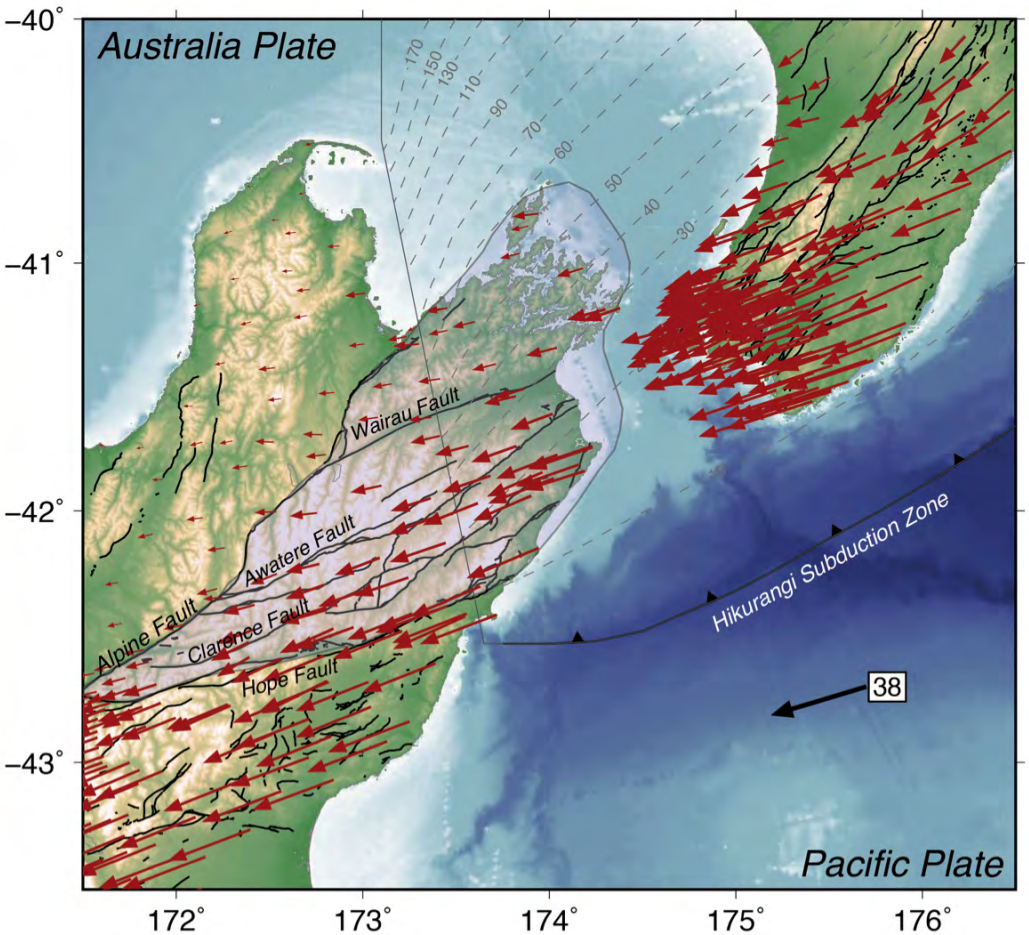




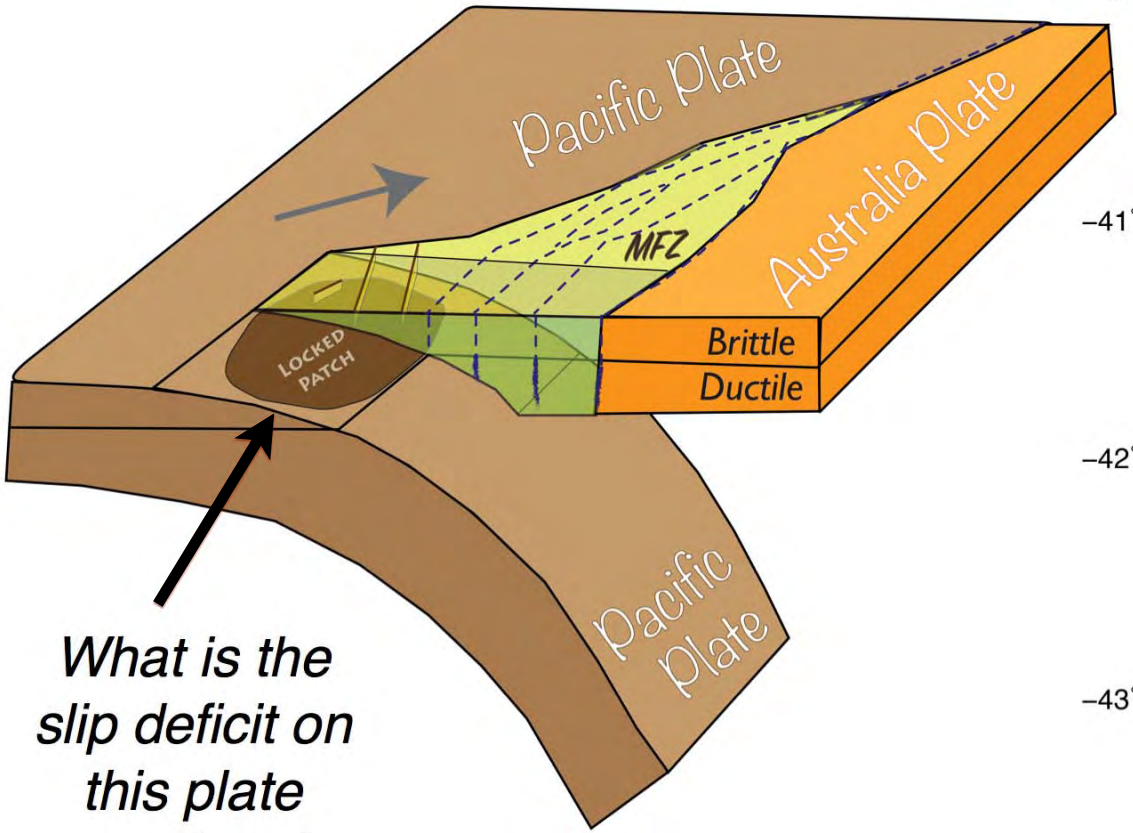
Furlong and Kamp, Tectonophysics, 2013

Transition from Subduction to Translation: Northern South Island, N.Z.

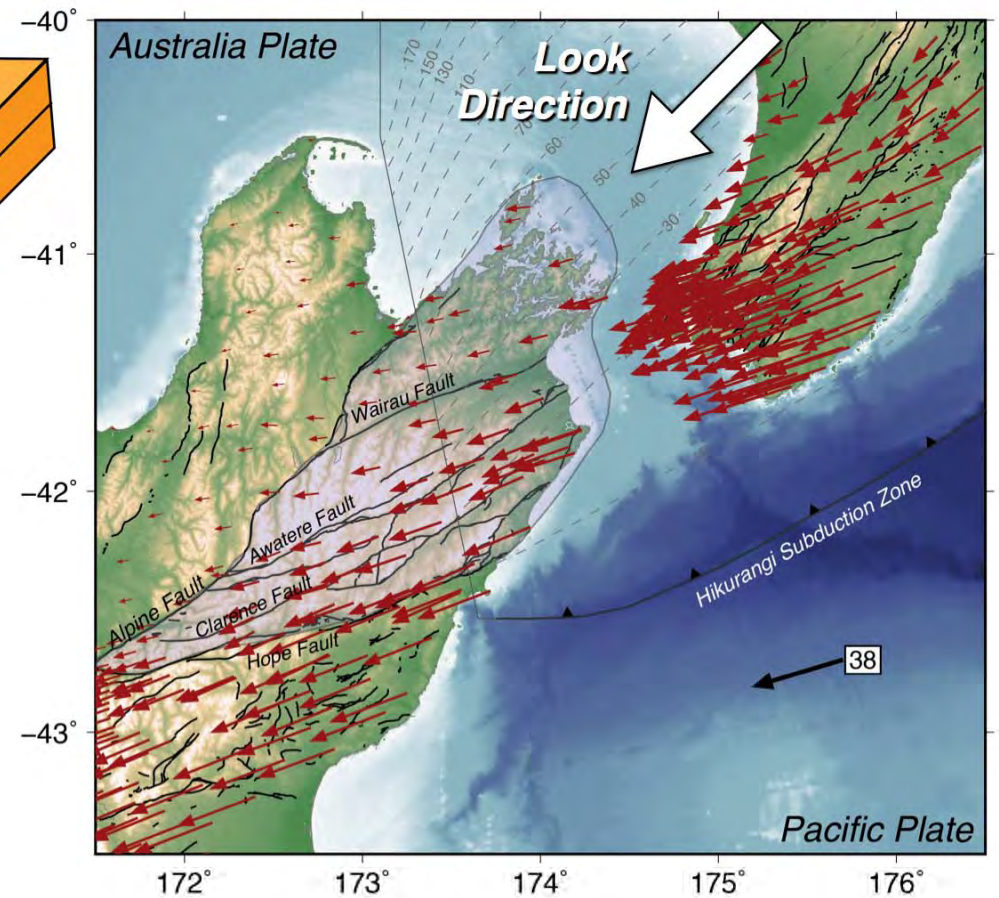




Transition from Subduction to Translation: Northern South Island, N.Z.



What is the slip deficit on this plate interface?



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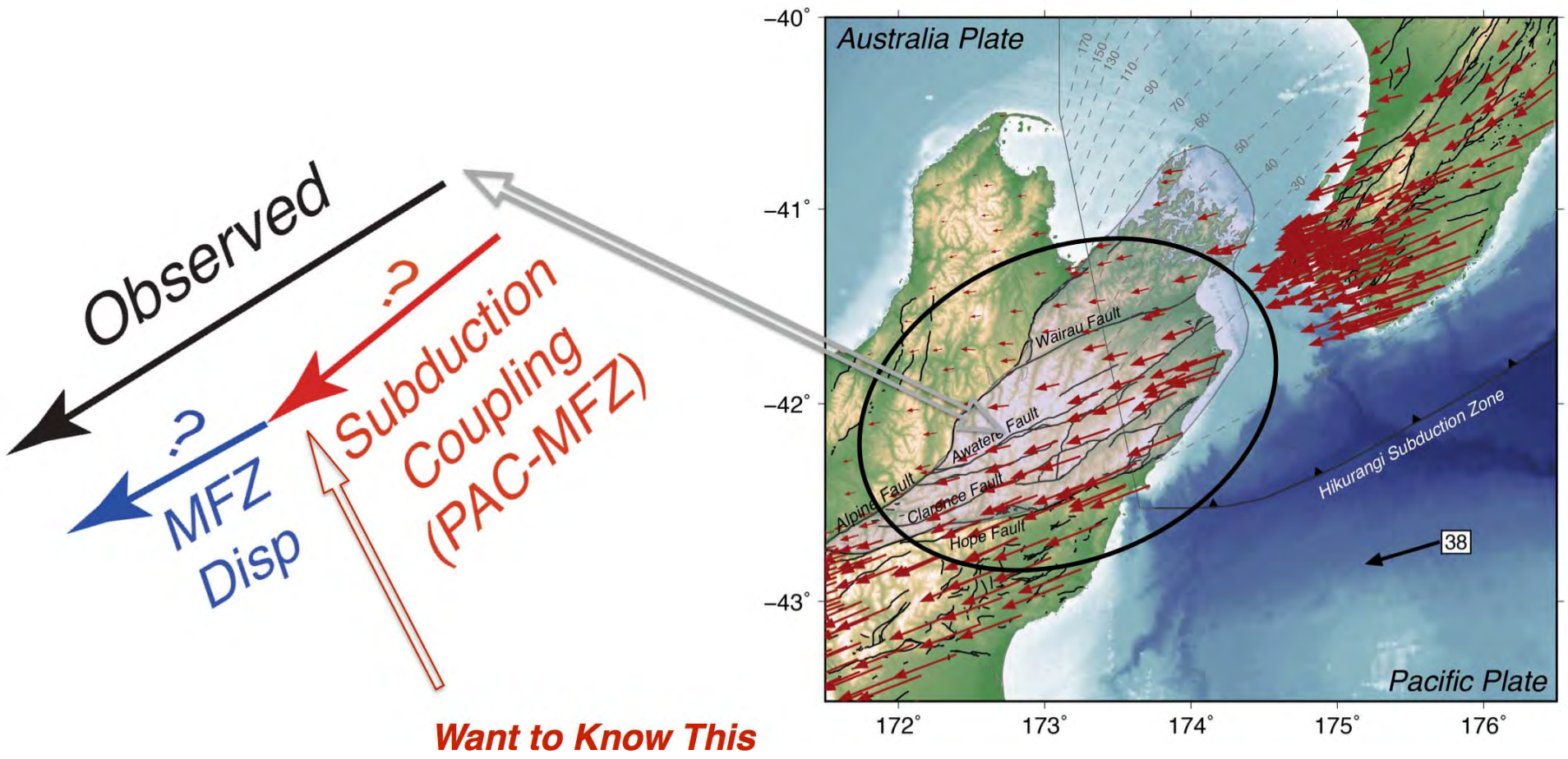

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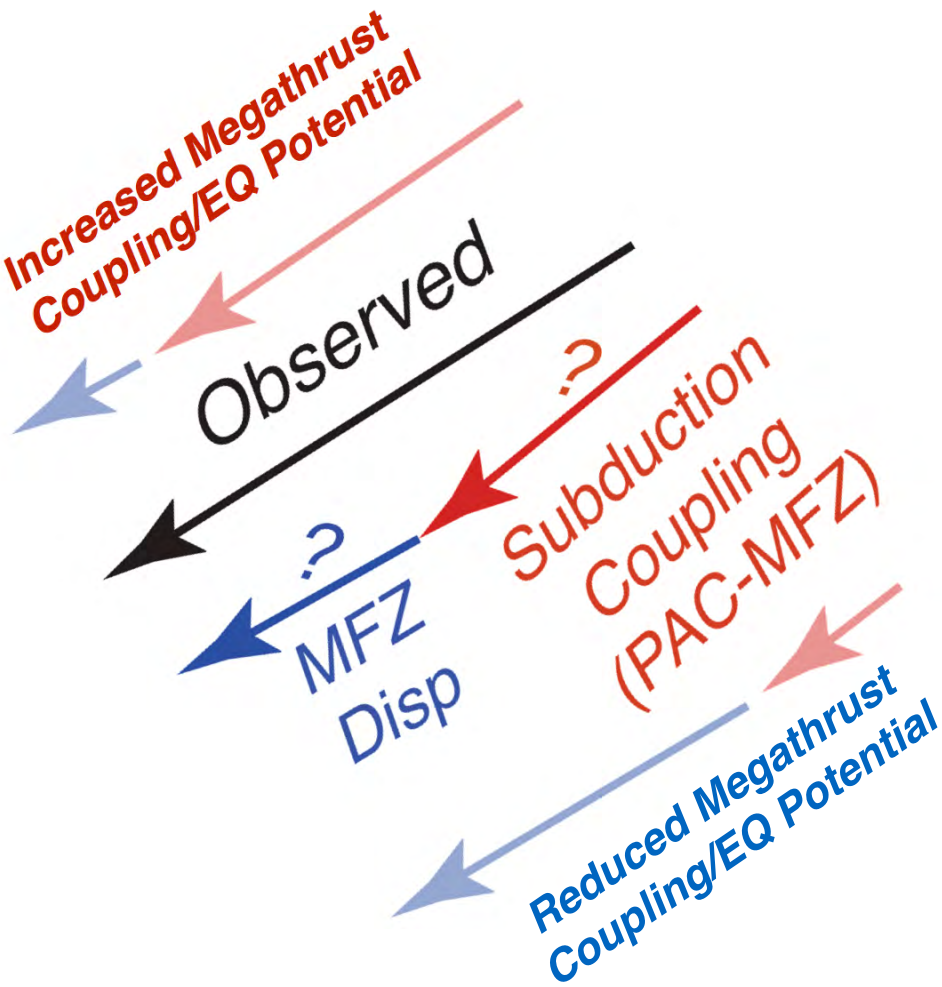

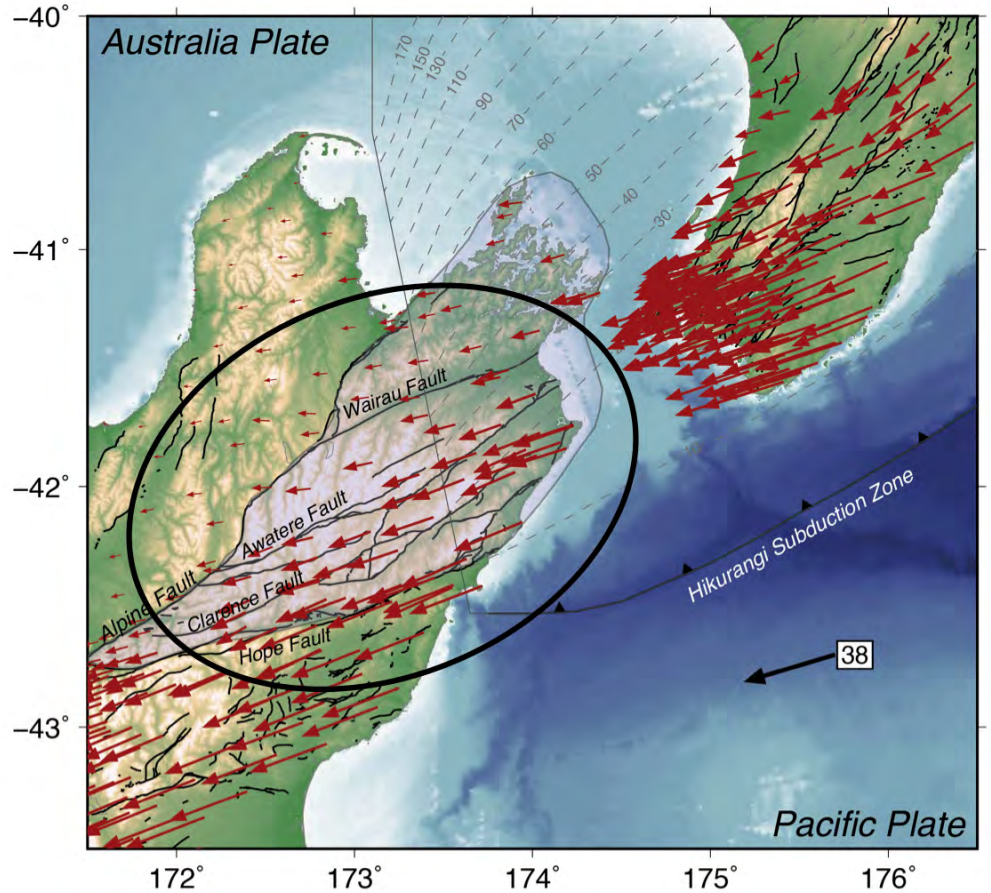

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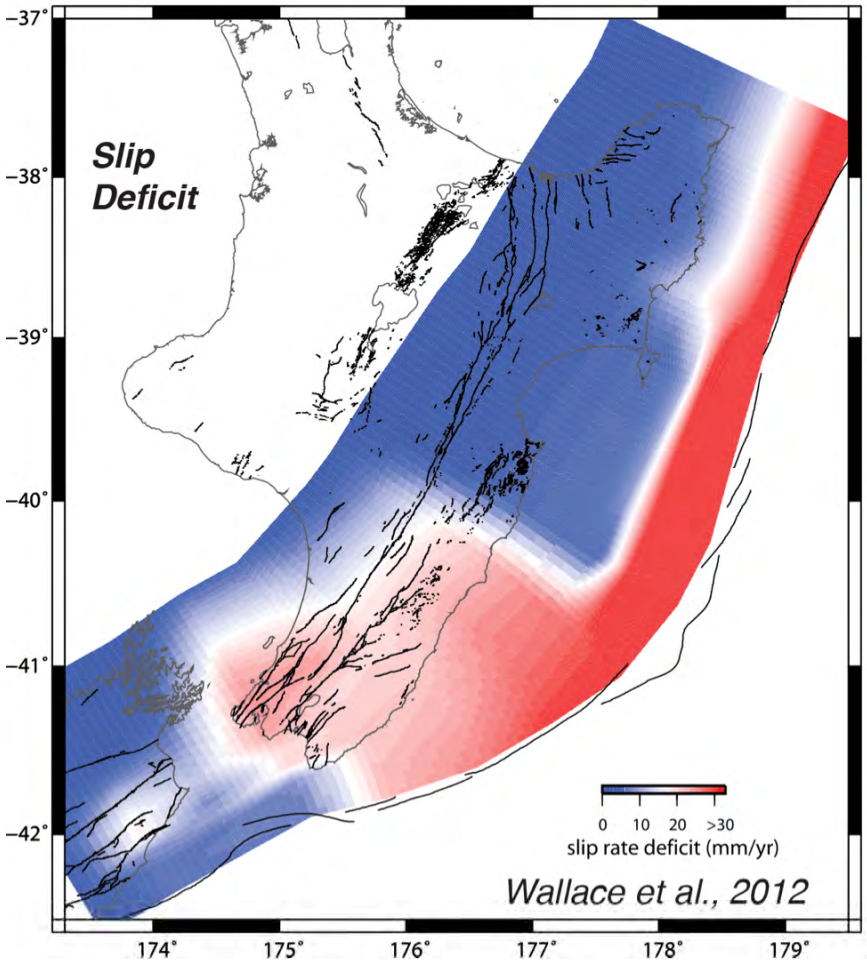

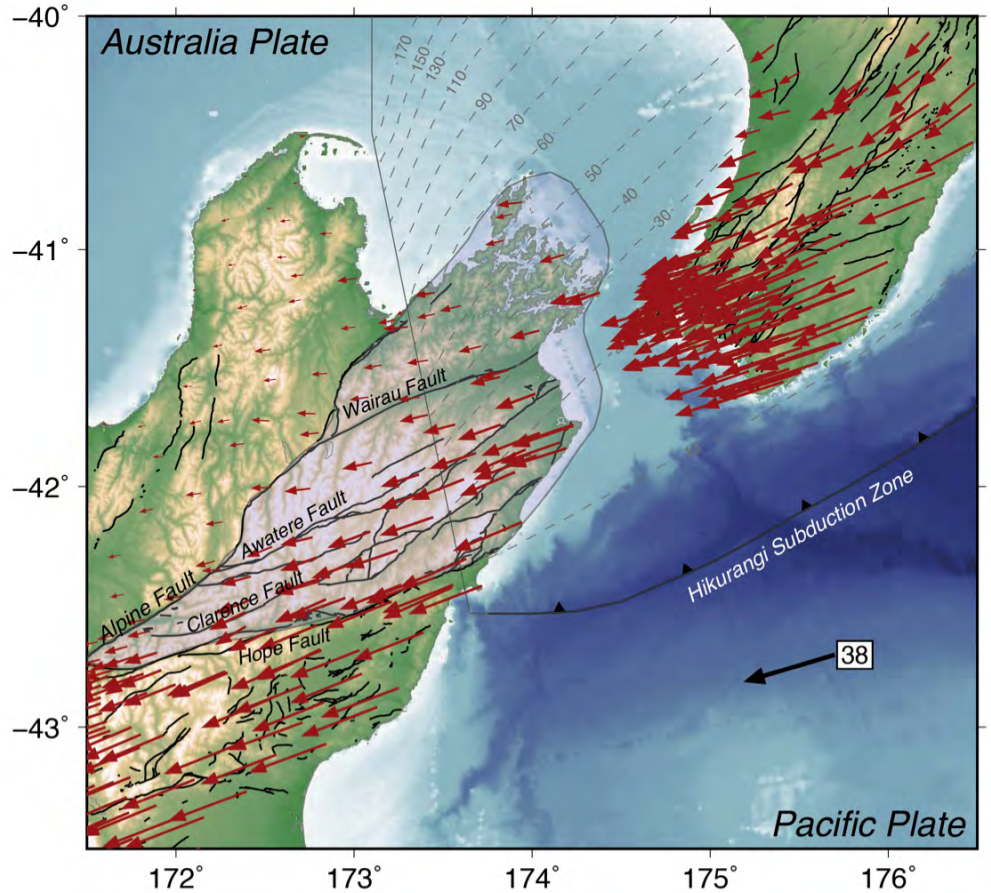

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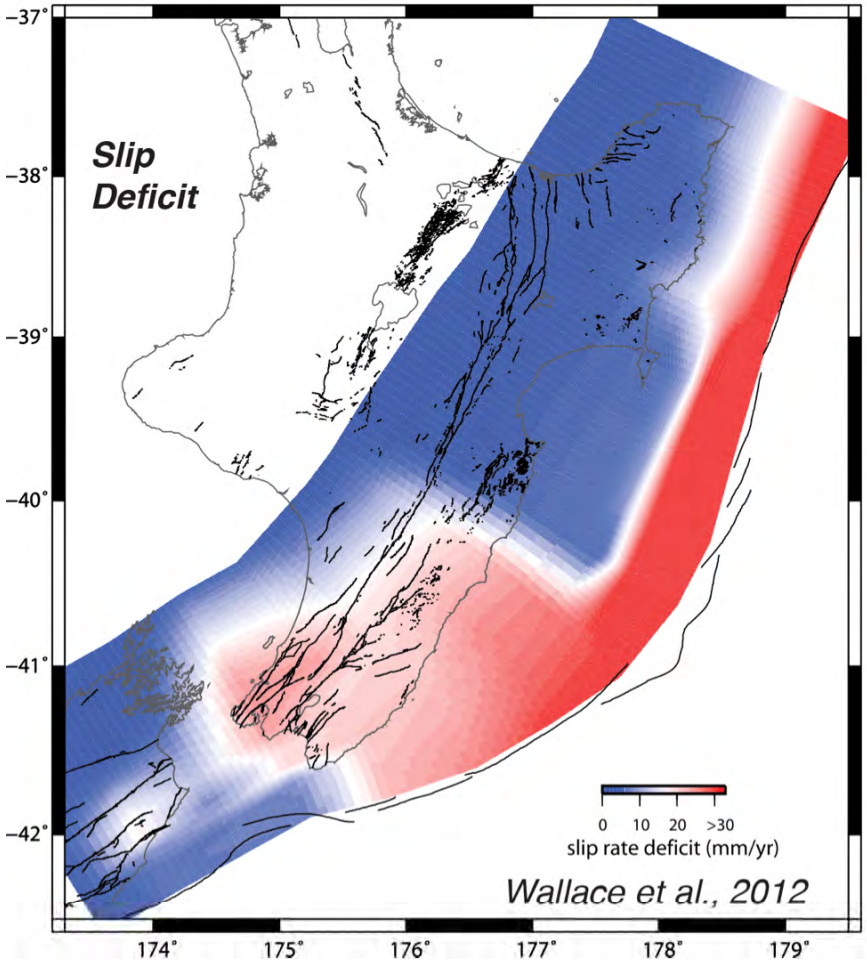
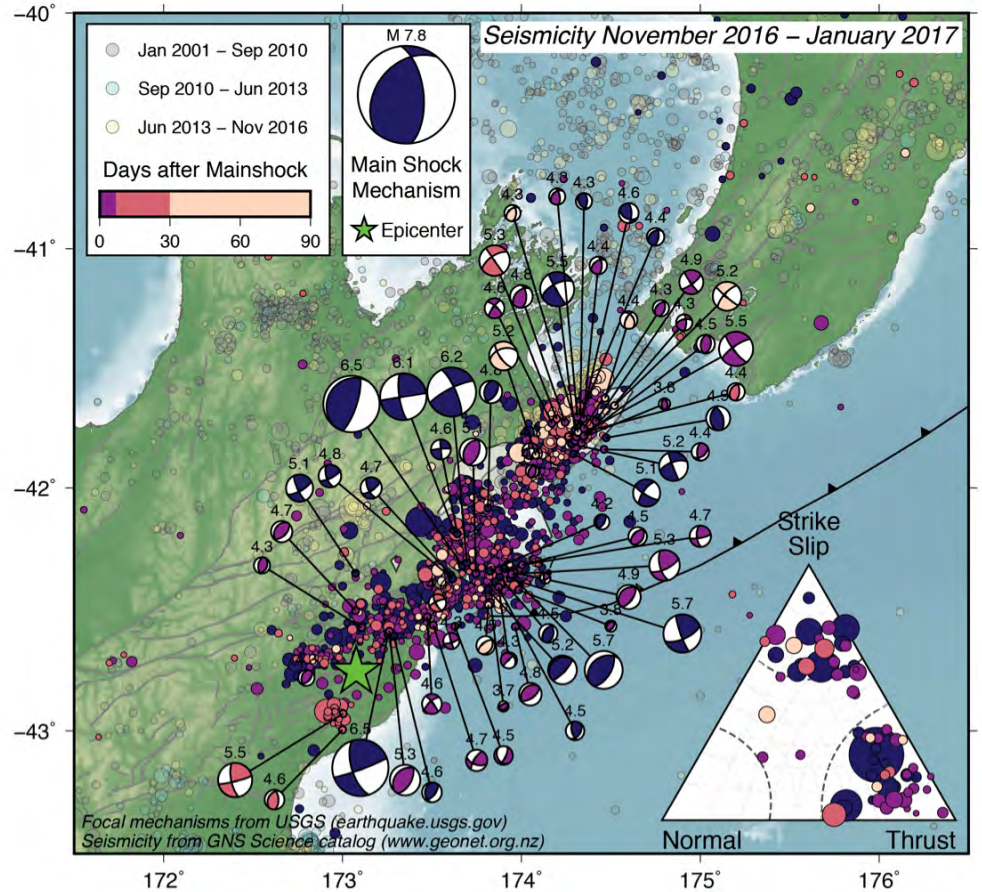
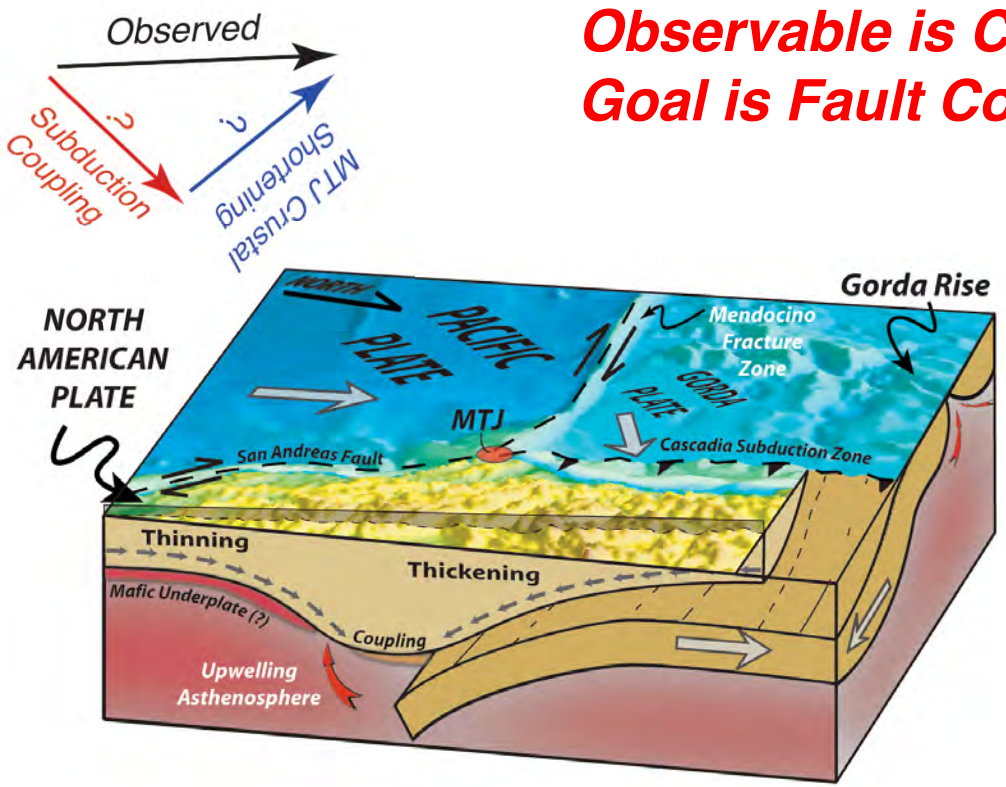
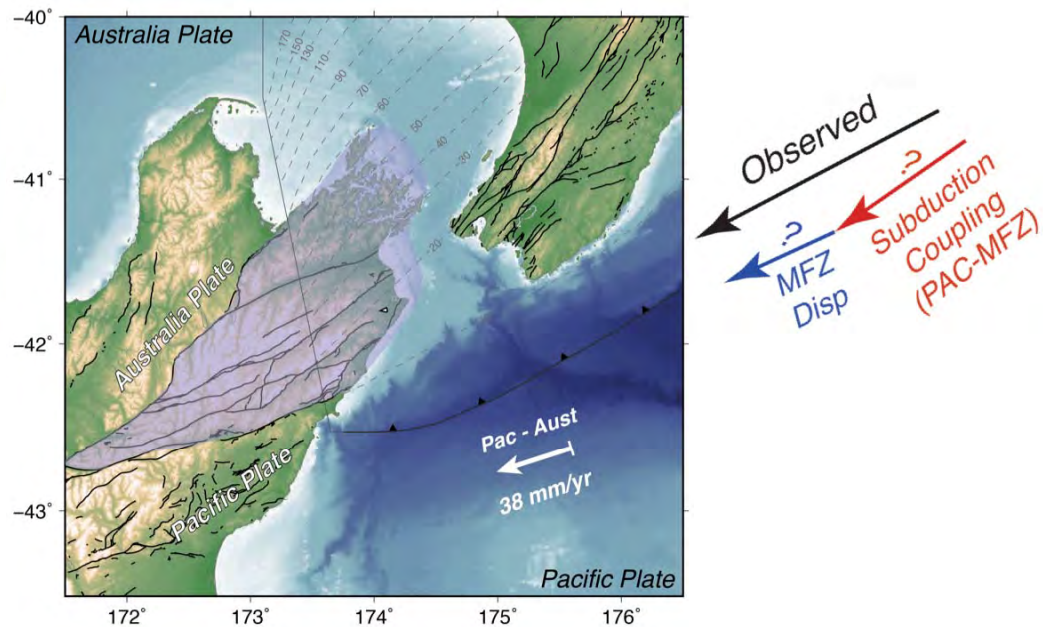




Hidden Earthquake Potential in Plate Boundary Transition Zones

Observable is Crustal Displacement
Goal is Fault Coupling Displacement





- *Fault Coupling on EQ cycle timescale*
- *Superimposed kinematics associated with transition acting on geological time scales*
- *In MTJ and NZ cases difficult to separate megathrust-driven deformation from total displacement field*

Planning Each Slide

Not too many words!