Impacts of extratropical-tropical interaction on subseasonal North American atmospheric variability

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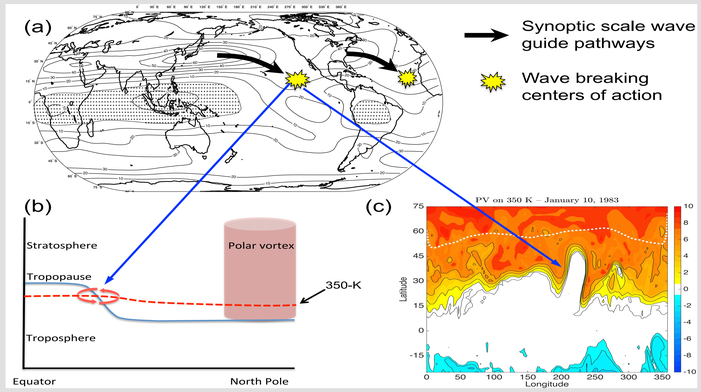
Potential vorticity intrusions: Why do we care?

- Extratropical-tropical transport
- Convection
- Surface air quality via stratospheric ozone
- Tropospheric cold-air outbreaks

Traditional view:

Winter potential vorticity (PV) intrusions are dominated by synoptic scale Rossby wave breaking

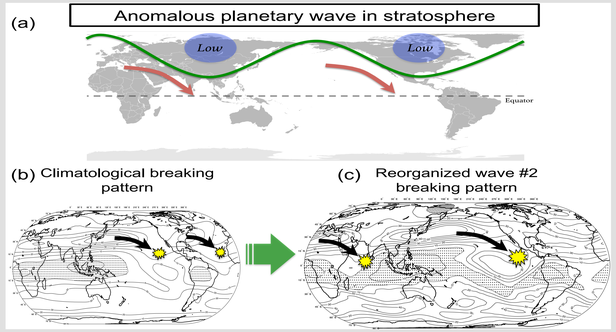


Open question is:

Does traditional view really describe the largest PV intrusions?

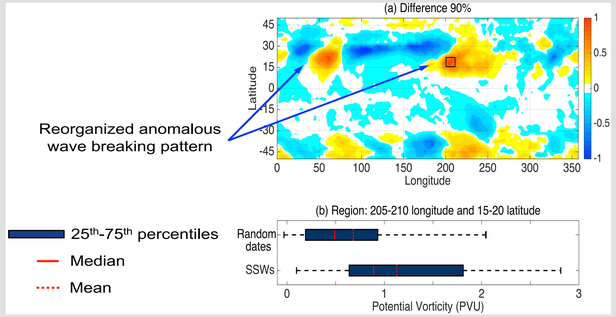
Proposed alternate hypothesis:

The largest PV intrusions are governed by low frequency planetary waves

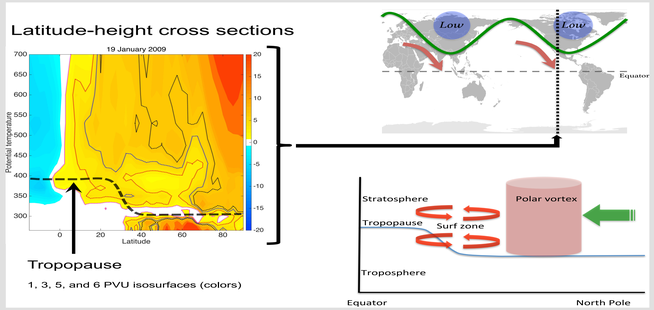


Quantifying the largest intrusions:

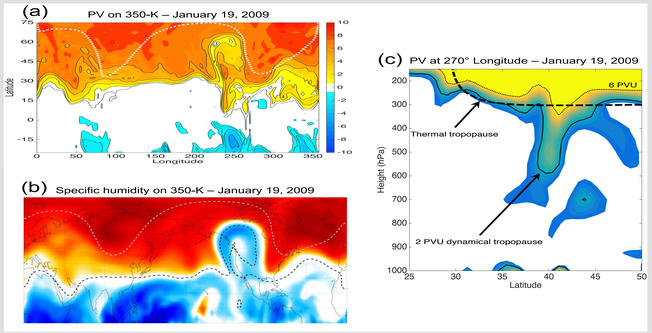
Time periods surrounding SSWs have enhanced wave breaking over (1) North American/East Pacific basin, and (2) South Asian/Indian basin



Physical mechanism:



Signature over North America:



Future work: Explore the impacts of the largest PV intrusions on the weather and climate over North America