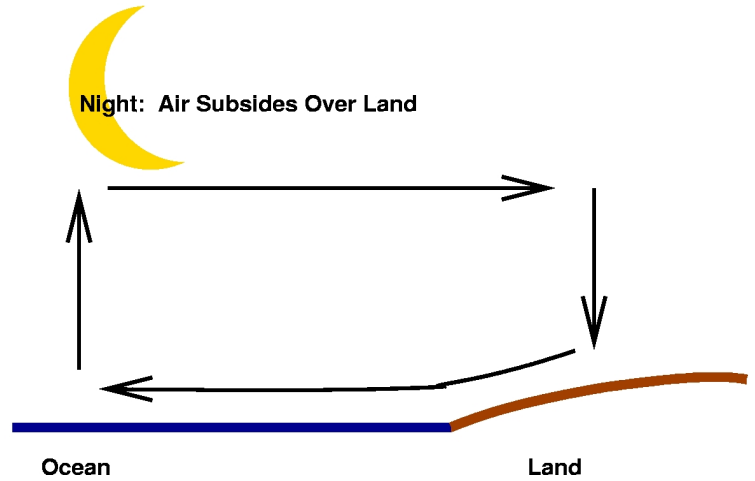
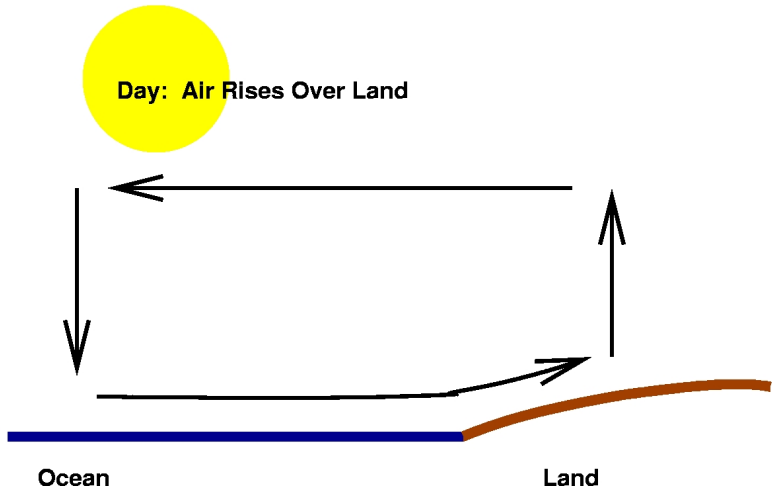


# Diurnal Winds and the Land/Sea Breeze from QuikSCAT and SeaWinds Tandem Mission Observations

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UCSD, La Jolla, CA

# Diurnal Wind Variations



# What to Look For in a Land/Sea Breeze

maximum wind speed?

distance?

timing?



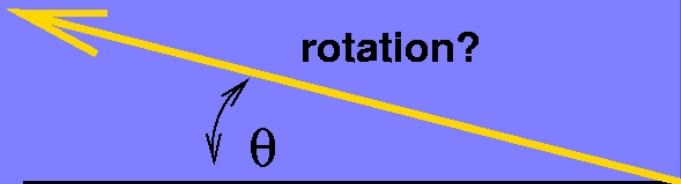
Ocean

Land

rotation?



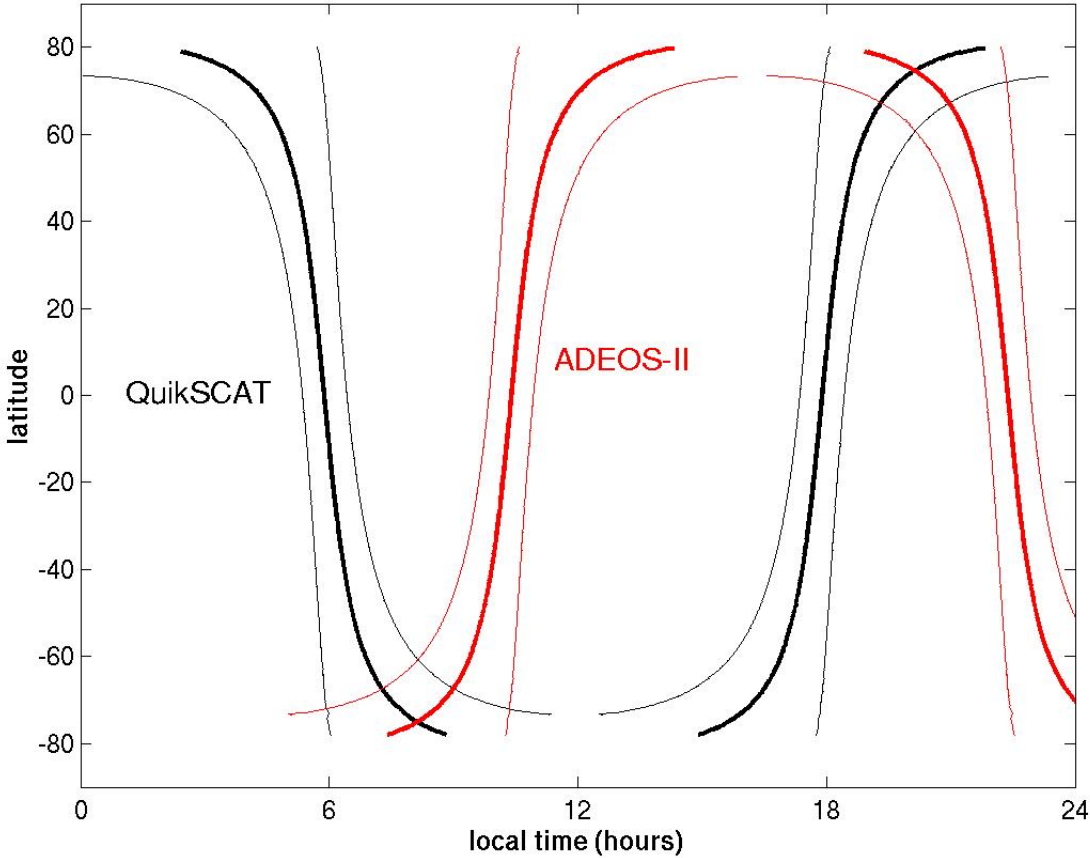
angle of wind relative to coast?



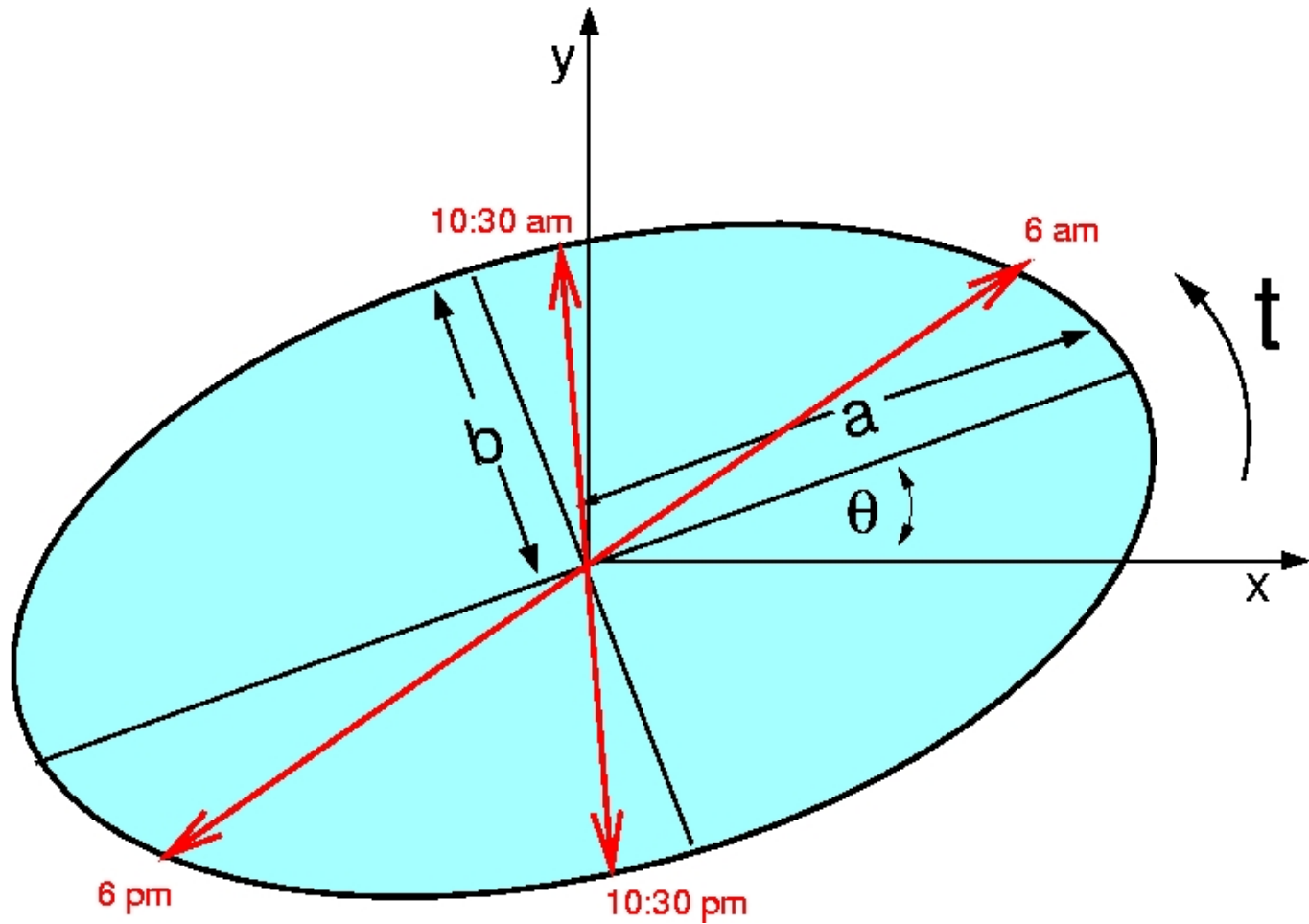
## SeaWinds Aboard QuikSCAT and ADEOS-II

- 1800 km wide swath
- 25 km spatial resolution, oriented relative to swath
- Design requirements:
  - Speed accurate to  $\pm 2 \text{ m s}^{-1}$  or 10%
  - Direction accurate to  $\pm 20^\circ$
- 6 months data: April to October 2003
- Bin average data at  $1/4^\circ$  resolution, using local time

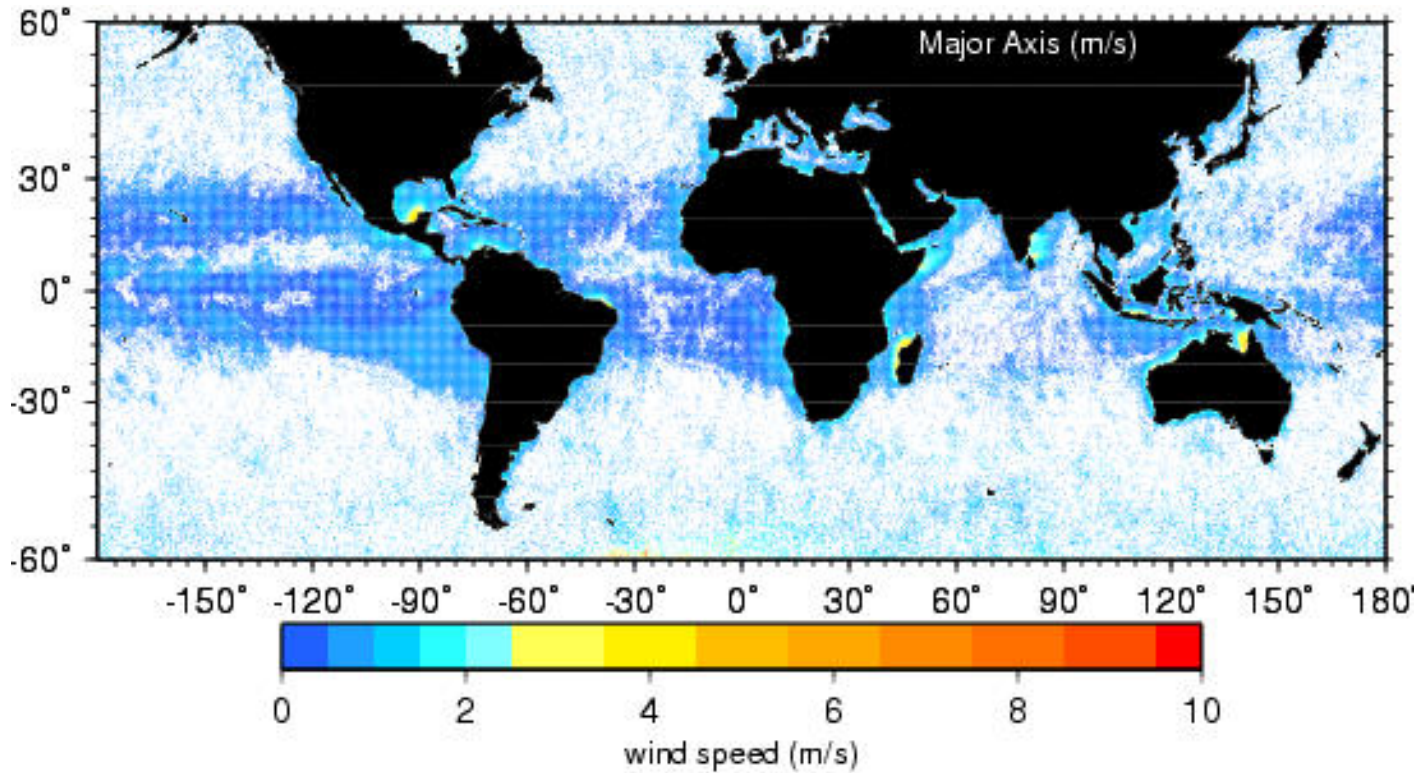
# Sun Synchronous Orbit



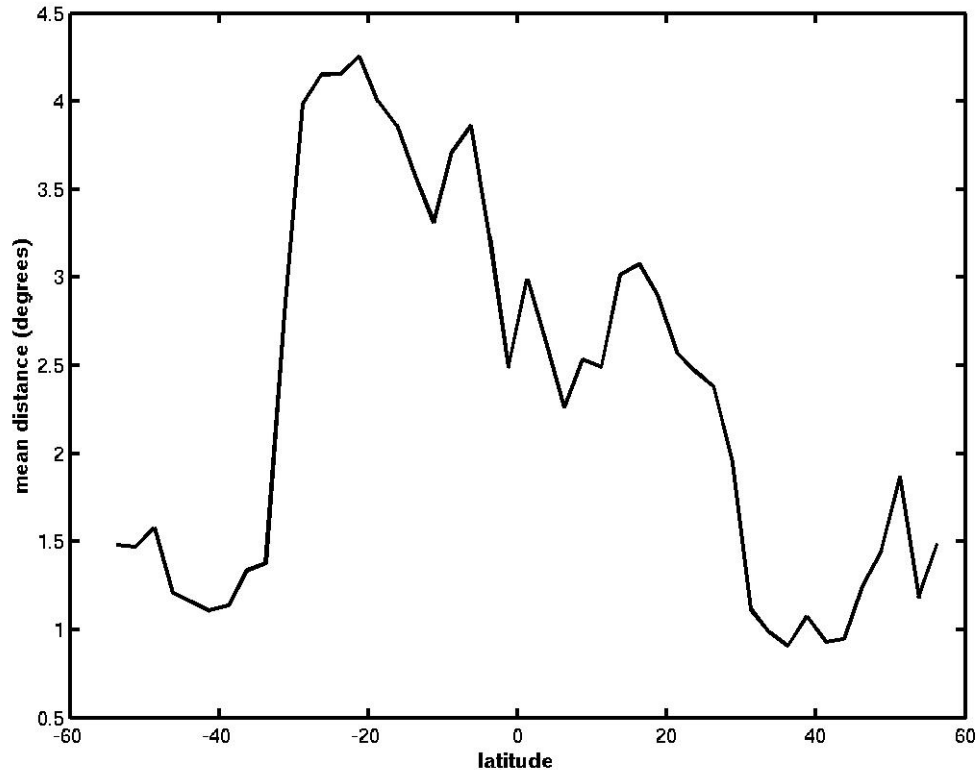
# Projecting Winds Onto an Ellipse



# Major Axis



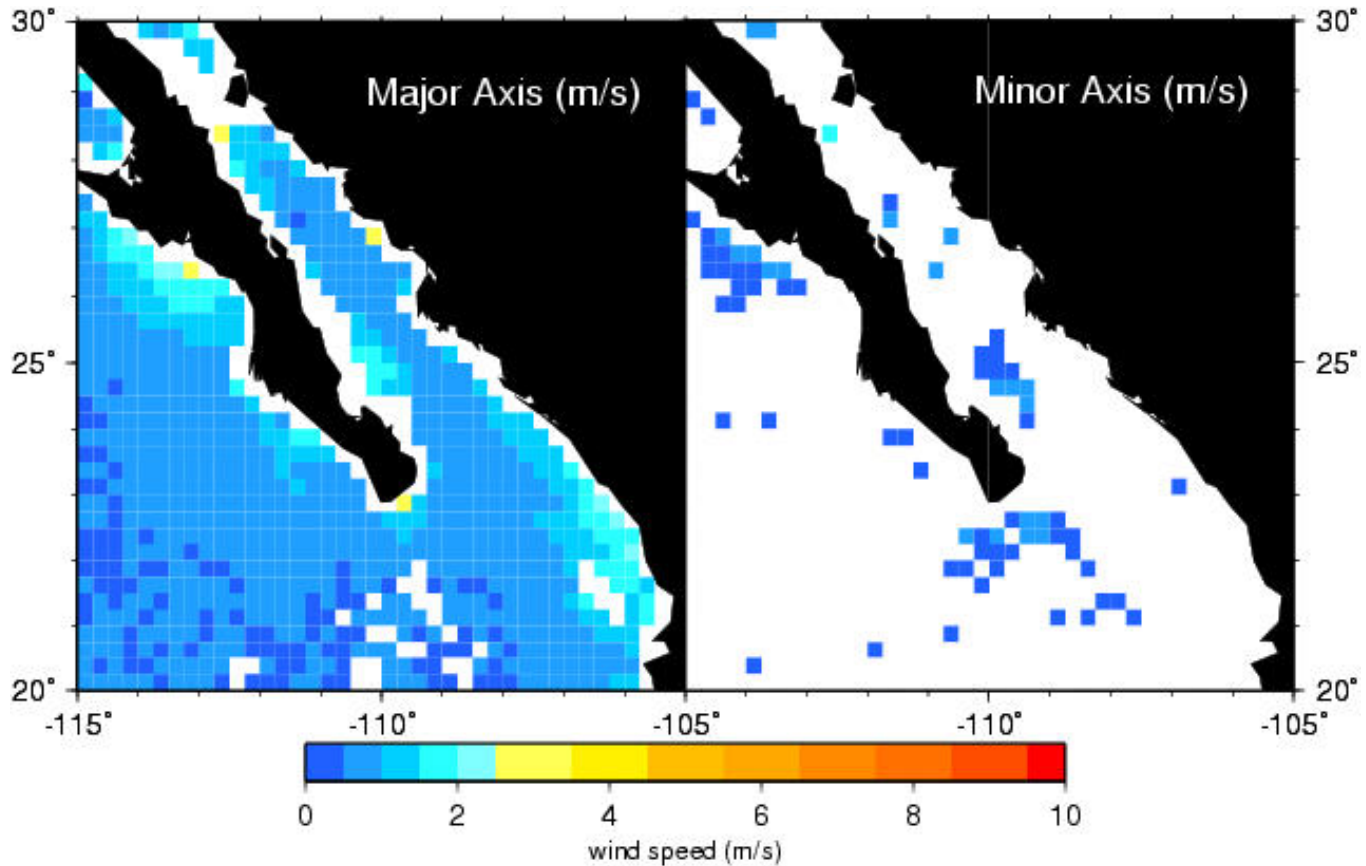
# Distance Offshore



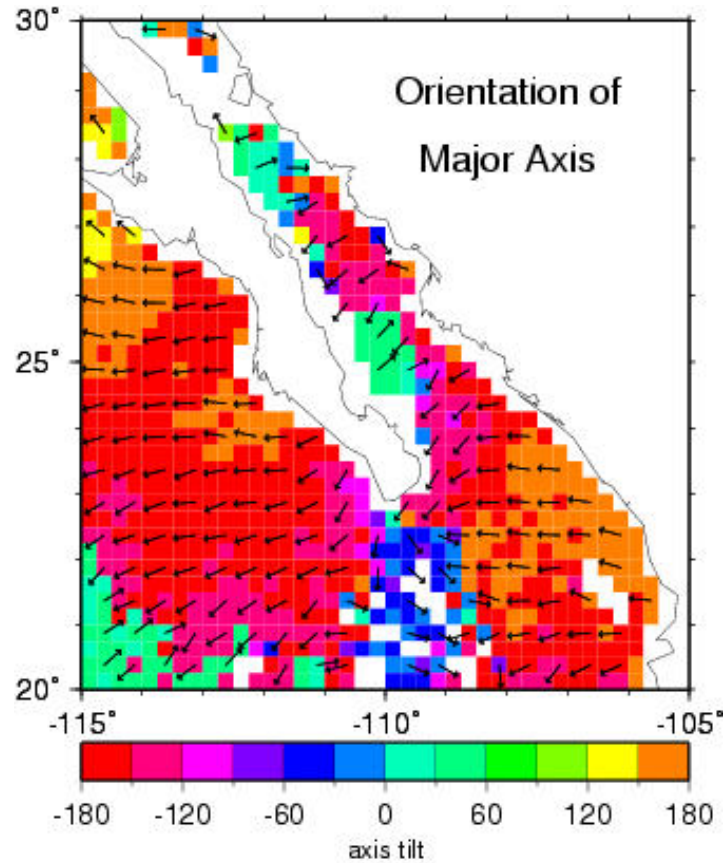
Linear theory predicts change at  $30^\circ$  [Niino, 1987].



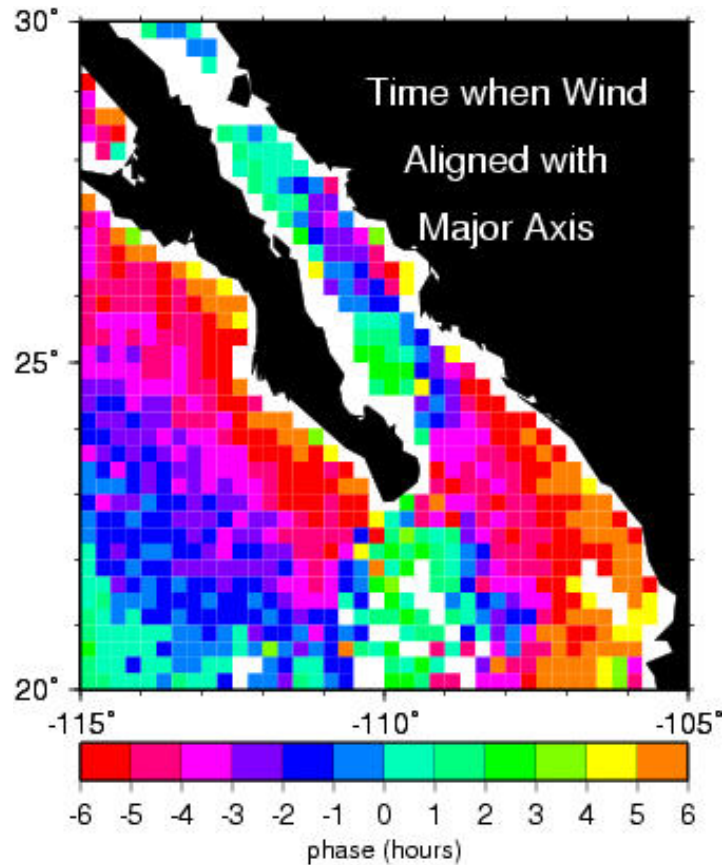
# Baja California Example: Major and Minor Axes



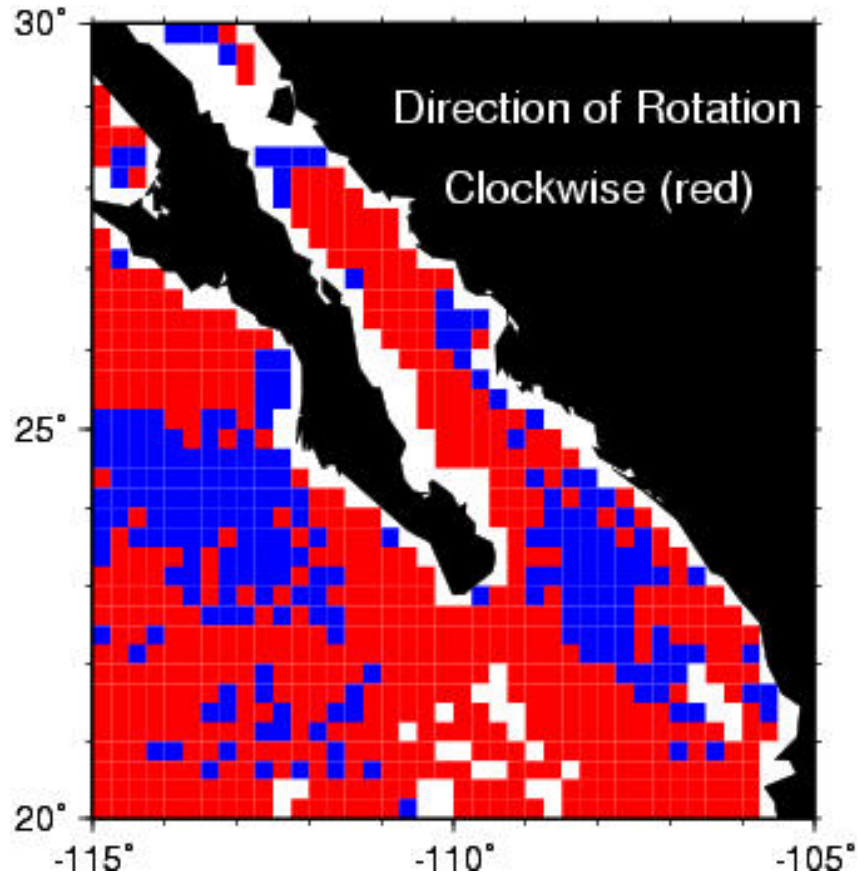
# Baja California: Major Axis Relative to Coast



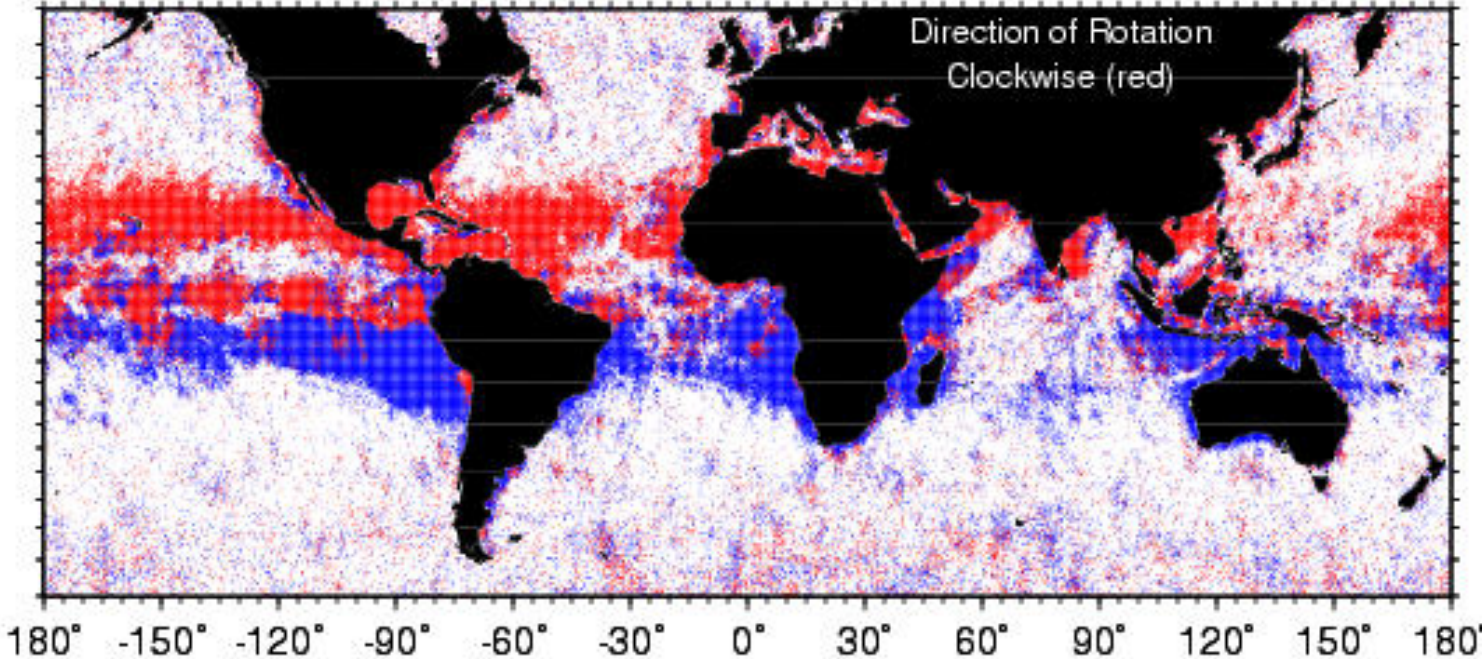
# Baja California: Offshore Propagation



# Baja California: Rotation Direction



# Global: Rotation Direction



## Summary: Land Breeze Structure from Tandem Mission

- Wind represented as ellipse
- Major axis perpendicular to coast
- Amplitude: 1 to 2 m/s
- Maximum at coast near 6 am/pm; propagates off shore
- Wind rotates clockwise in Northern Hemisphere, as expected