**Estimating Wind Power Input to near-inertial Currents in the North Atlantic with a coupled regional Model**

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**Do more storms produce more Wind Power Input?**

**Wind Power Input is more effective in the subtropics**

- Near-inertial Wind Stress Magnitude (NIWSM, Fig. 3). The part of the wind stress spectrum that is most efficient in generating Wind Power Input. Related to the storm track (Figs. 1, 2).
- Compare Figs. 2 and 3: Subpolar NIWSM in 1989 is stronger than subtropical NIWSM in 2010. Yet, subtropical WPI is enhanced in 2010 relative to subpolar NIWSM in 1989, i.e. WPI is more effective in the subtropics.
- Several factors. Most important: NIWSM creates near-inertial currents more effectively in the subtropics.
- Implications for interannual variability of WPI:
  - Build linear models of WPI for different latitude bands (Figs. 4, 5).

**Wind Power Input and Storminess: An inverse Relationship**

- Use a 1/10° regional model of the North Atlantic and force it with NCEP/NCAR wind stress for two extreme NAO years: 1989 and 2010 (Fig. 1) – WPI response?
- Importance of Wind Power Input (WPI) to near-inertial currents:
  - Generation of near-inertial energy in the ocean
  - Impact on global climate
- WPI is most efficient in response to passing storms
- Relationship between the NAO – a good indicator of storminess – and WPI?

**Outlook**

- Wind Power Input is more effective in the subtropics
  - Enhanced impact of subtropics on total WPI
- Overall: Inverse relationship with NAO (r = -0.42)
  - Total WPI: 6.84 (9.64) GW in 1989 (2010) (Figs. 4, 5)

**Fig. 1**: Storm track (grey shading) and individual storm paths. The line colour refers to the maximum intensity of the system in terms of minimum core pressure.

**Fig. 2**: Mean JFM near-inertial wind stress magnitude in left (1989) and right (2010). Boxes denote areas of enhanced Wind Power Input.

**Fig. 3**: Mean JFM Wind Power Input in left 1989 and right 2010. Boxes as in Fig. 2.

**Fig. 4**: Linear models of WPI for left high, middle, and right low latitudes. Linear models for single years. Solid grey lines: Linear models for both years.

**Fig. 5**: Normalized time series of the NAO index (grey bars) and Wind Power Input (colored lines) estimated from the linear models. Correlation coefficients are for the time series of WPI and the NAO. Note that subtropical WPI is roughly an order of magnitude larger than subpolar WPI.