# Imme Ebert-Uphoff

## *Knowledge discovery from data in the Geosciences*



**What can we learn about underlying physical processes from data ?**

- **Primary tool:  Causal Discovery methods, i.e. finding *potential* cause-effect relationships from data using conditional independence tests.**

  **→ Identify interactions – between variables, locations, time scales, …**

# Identify interactions – between variables, locations, time scales
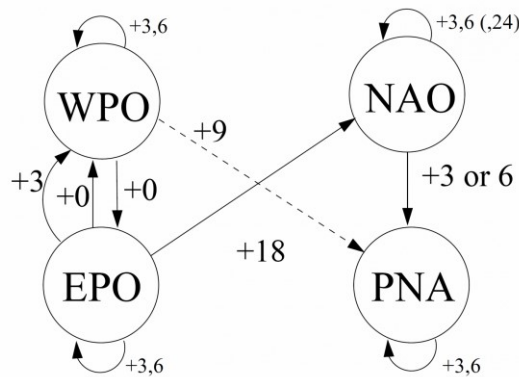
**Examples:**



Fig. 1: Interactions between four different modes of the climate system (in days)
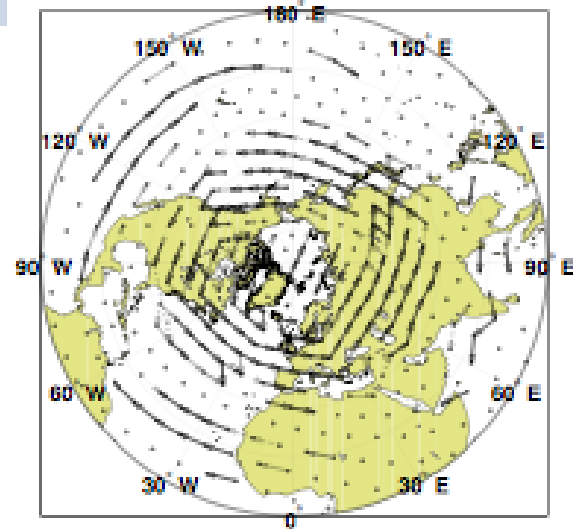


Fig. 2: Interactions between locations (due to storm tracks) deduced from geopotential height data.

## Collaborations I'm looking for:

- **New applications to try these methods on.**

- **Would you like to learn more about underlying processes from data?**

- **Goals: (1) Derive new hypotheses about interactions from data.**
  **(2) Learn new details about patterns of interactions.**

- **Needs large sample size. Can be spatio-temporal.**