

Summary from the group exploring “Spatial versus temporal data analysis”, with Eric Siero, Arjen Doelman, Anna Maria Cherubini, Karna Gowda, and Marian Gidea.

Question: How to bridge the gap between data and models for desertification/vegetation pattern formation

-Rietkerk/Kefi study...is there something similar that can be done for spatially extended models?

-can we see the same scaling behavior in PDEs?

-Is there agreement between modeling approaches, i.e. cellular automata type and pde type models?

-regular patterns in PDE systems appear close to pattern bifurcation points...the more irregular behavior, similar to in cellular models, occurs away from these points and is roughly similar

-What kind of info can we extract from data?

-How big must the observed area be to establish the significance of an observation?

-What is the difference between patterns that we see under the idealized case of continuous rainfall and more realistic rainfall.

-this may depend on the type of vegetation pattern

-could be captured through a noisy parameter

-Data on evolution of patterns would be useful

-ex: a Belgian group demonstrated the upward climb of stripe patterns

-groups are making time series of ecological data by sifting through a number of records.

-We want to extract basic mechanisms from the

-one interesting/relevant question is modeling the spread of desertification fronts.

-Can we extract dynamic info from largely static data?

-Need at least 2 time points? A year of photographs?

-Accurate spatial info about moisture.

-Assume that we have the info...how do we connect to models?

-identify perturbations in the data as localized events that can be modeled. May have a relationship with desertification fronts.

Conclusion: It would be very useful to organize a symposium connecting conceptual climate modelers with those who have data and understand it. We would like to know what one can see. We also would like to have a good idea in advance the kind of data that we want. Our goal is not to make models more "realistic" by adding assumptions and complexity but to pin down the key mechanisms.