Discussion group on Thursday on "Noise and attraction" (participants: Mary-Lou Zeeman, Clare Perryman, Arjen Doelman, Jan Sieber, Marian Gidea):

- The discussion started with a reminder of the motivation behind the assumptions made when modelling with "white/Gaussian" noise: a large number of small random and independent influences is acting on the system: either as a fast chaotic subsystem, or as genuinely random events.
- Some examples where these assumptions may be violated are rainfall modelling in vegetation patterns or dams (the example was dams in Arizona, a problem studied by Marty Anderies). In dry climates rain may be sparsely timed impact-like events, where a single random but extreme event can have a major influence.
- A potentially interesting problem are possible generalizations of the theory for most likely barrier crossing (Freidlin-Wentzell theory) to non-autonomous systems (for example, Lagrangian Coherent Structures in fluid dynamics).
- An observation about the distinction between noise-induced tipping and bifurcation-induced tipping was made. This distinction is not clear-cut. Noise-induced tipping is facilitated if the system is at a parameter close to a bifurcation. It is predictable (if the model is known). The prediction is given as an escape rate (which is roughly constant in time). Bifurcation-induced tipping is different only in that this escape rate changes over time. (In this scenario a system parameter approaches a bifurcation, but tipping can also occur before the critical value is reached.)