



The Wild Side of Societal Self-Organization

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Main Themes

- Societal Self-Organization
- Mild Forms and Wild Forms of Societal Self-Organization
- Generative Mechanisms towards Wild Forms
- Risks and Sustainability of Wild Forms



Societal Self-Organization

Main Requirements:

- No Effective Control and Steering Components
- Arrow of Order (Complexity)
- Measure for Order (Complexity) H with Increasing Values:

$$\Delta H \geq 0$$



Mild Forms and Wild Forms of Societal Self-Organization

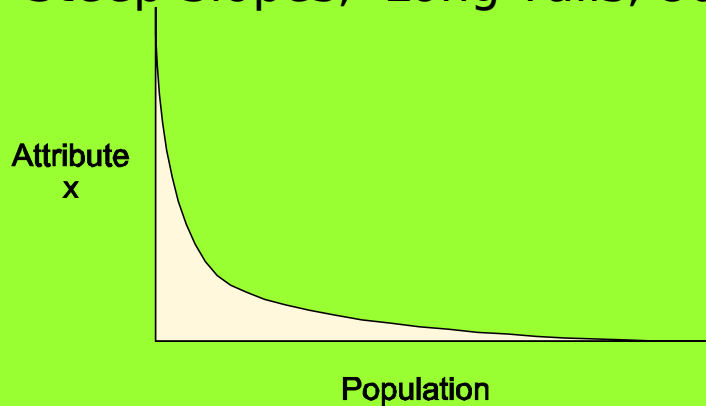
“What is the probability that someone has twice your height? Essentially zero! The height, weight and many other variables are distributed with ‘mild’ probability distribution functions with a well-defined typical value and relatively small variations around it.

What is the probability that someone has twice your wealth? The answer of course depends somewhat on your wealth but in general there is a non-vanishing fraction of the population twice, ten times, or even one hundred times wealthier as you are.”

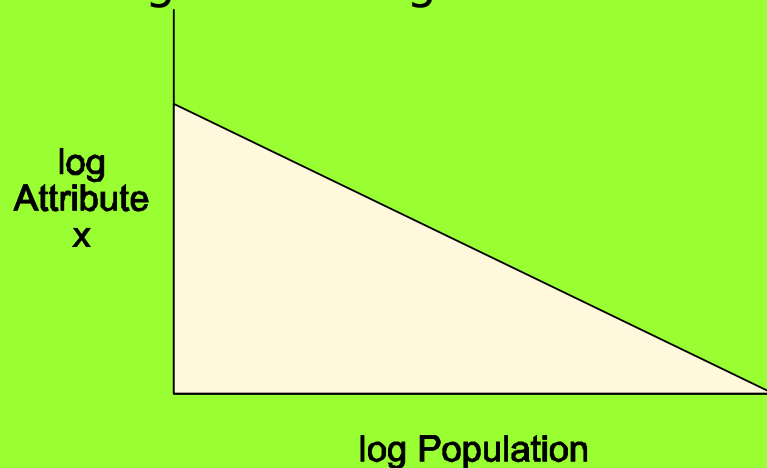
Didier Sornette (2006), *Critical Phenomena in Natural Sciences. Chaos, Fractals, Selforganization and Disorder: Concepts and Tools*, second edition. Berlin:Springer, 104

Characteristic Features of Wild Distribution Functions

Steep Slopes, Long Tails, 80:20 Rule



Using a Dual-logarithmic Scale





Wild Nature, Mild Society?

Per Bak (1996), *How Nature Works. The Science of Self-Organized Criticality*. New York: Springer

- Sandpile-Paradigm
- Geomorphology
- Earthquakes
- Solar Flares
- Ecological Systems

- The Brain
- Economics
- Traffic Jams



The Vision of a Wild Self-Organizing Society

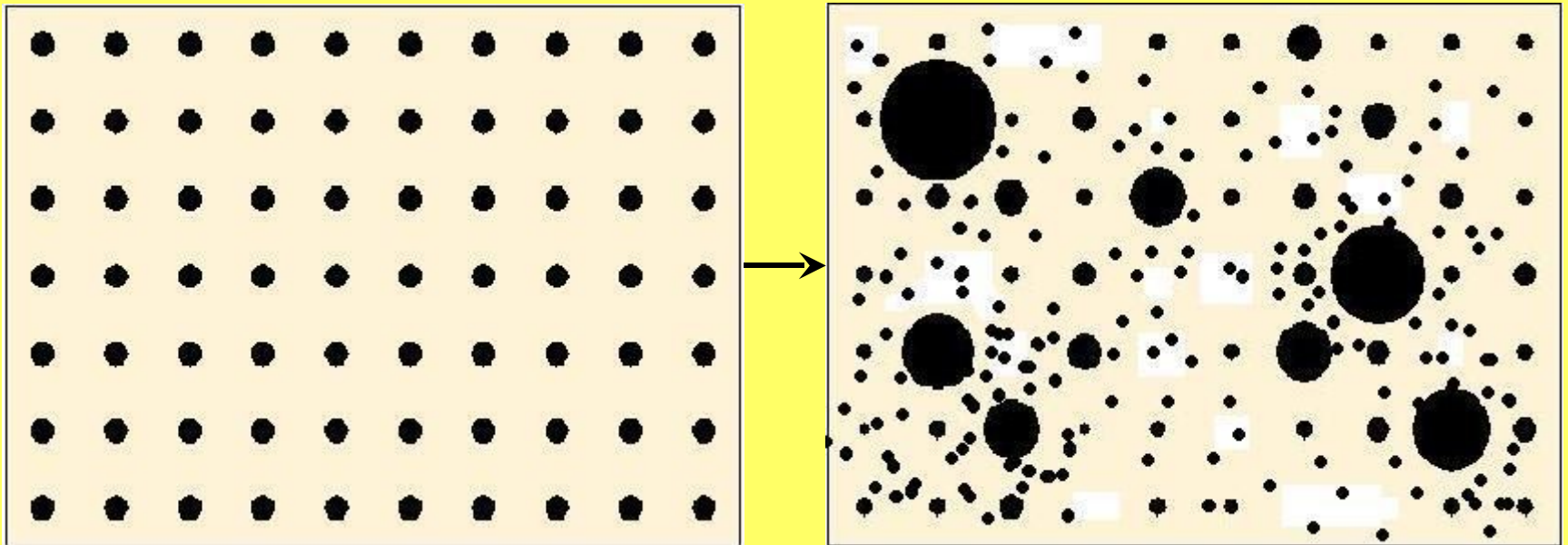
George Kingsley Zipf (1949), Human Behavior and the Principle of Least Effort. An Introduction to Human Ecology. Cambridge: Addison-Wesley

Part I: Language and the Structure of Personality

Part II: Human Relations

- The Economy of Geography
- Intra-national and International Cooperation and Conflict
- The Distribution of Economic Power and Social Status
- Prestige Symbols and Cultural Vogues

George K. Zipf: Wild Distributions as A Stable Equilibrium State



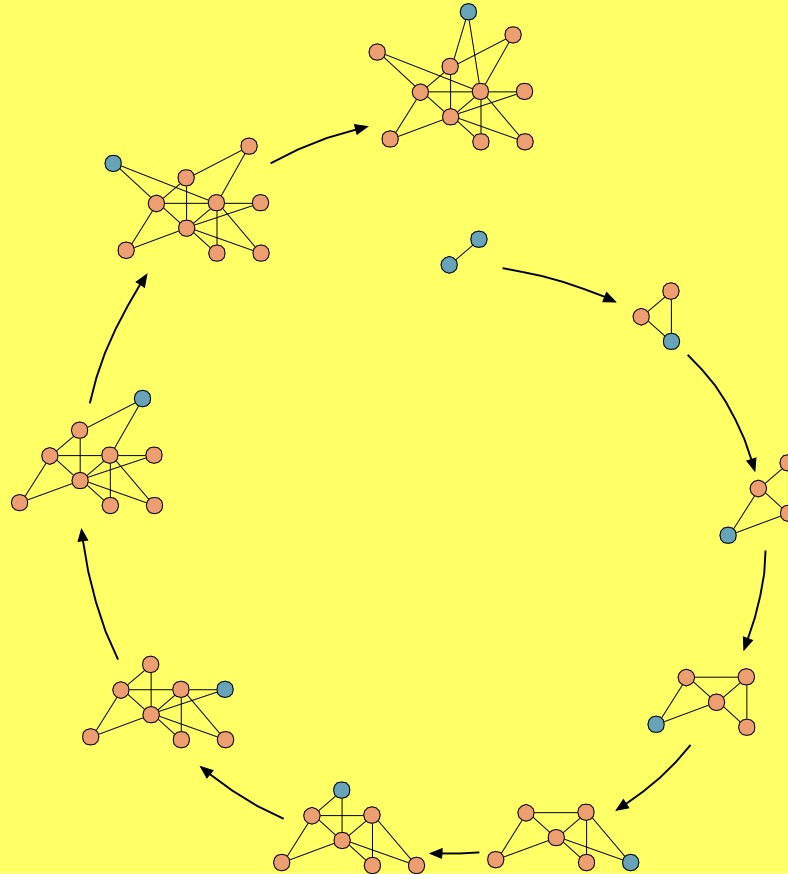


The Emergence of Wild Forms of Self-Organization

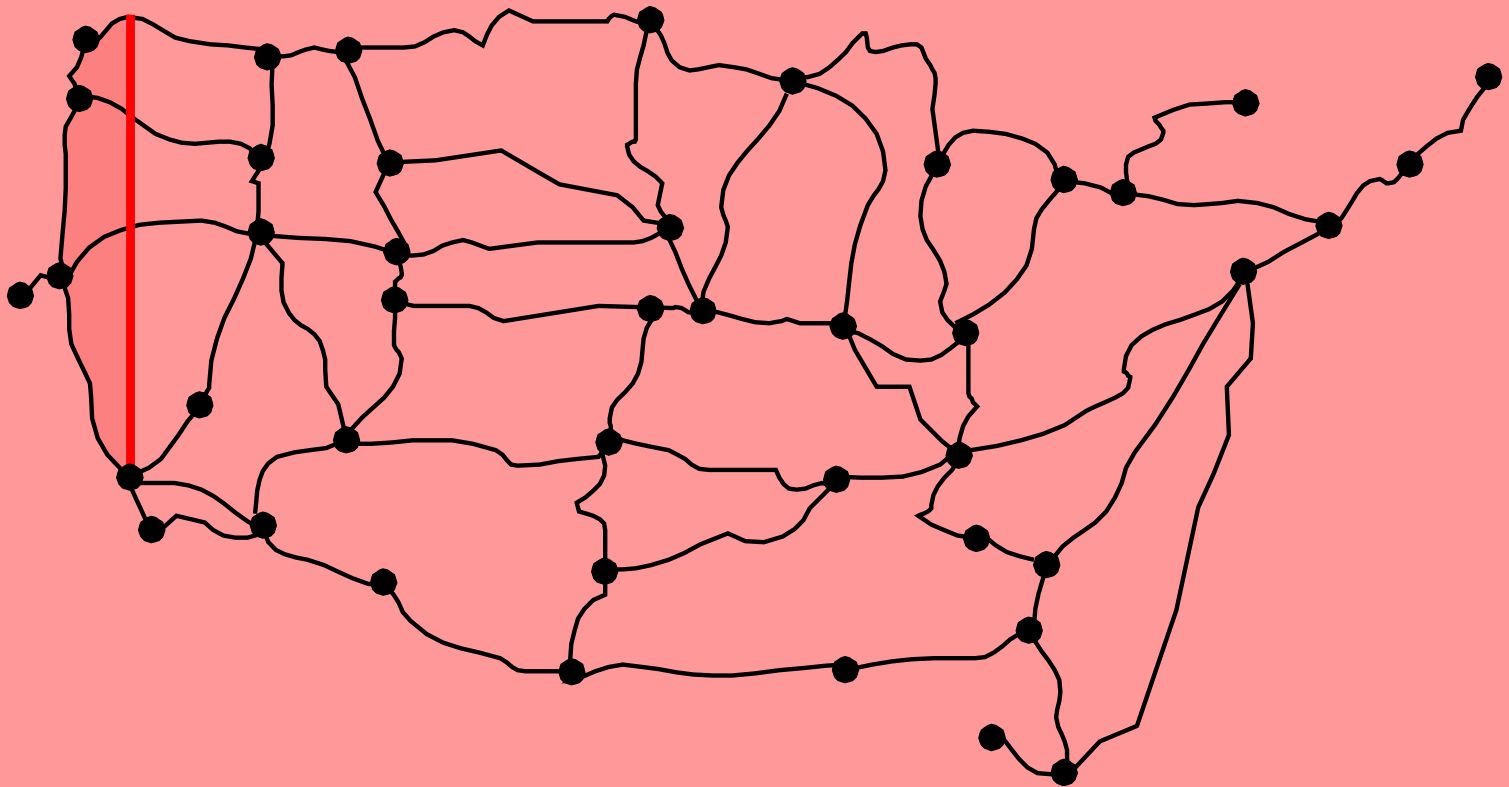
- Phase Transition to a Critical State
- Power-Law Distributions of RISC-Processes
(**R**are **I**ncidence, **S**trong **C**onsequences)

The Emergence of Complex Networks

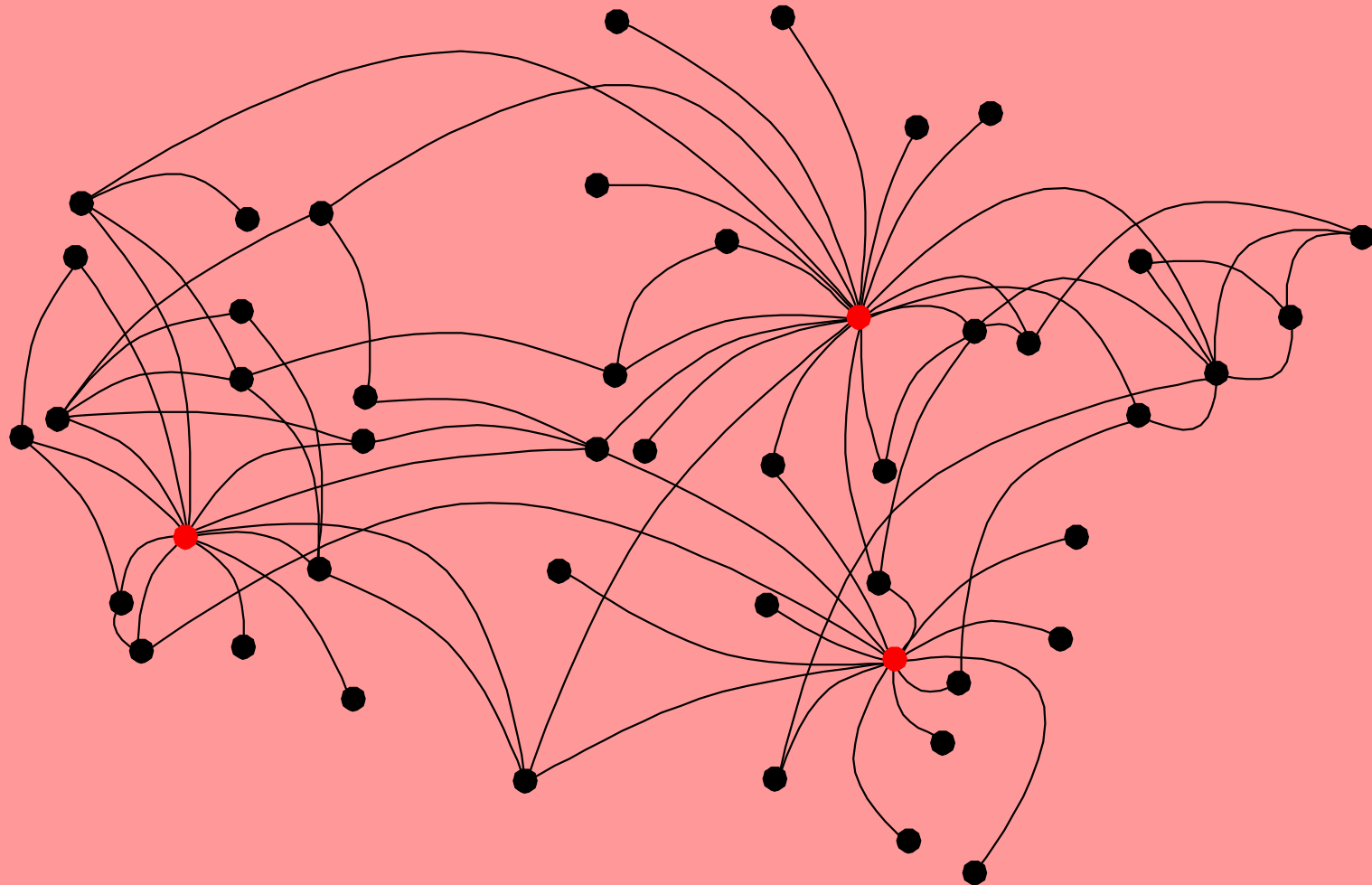
- Growth Process of Network Components
- Preferential Attachment



Risk-Potential of Random Networks: Regional Failures



Risk-Potential of Complex Networks: Global Stability with an Achilles-Heel





Leading Sectors of Long Waves and Societal Sustainability

Leading Sector	Type of Infrastructure-Networks (Energy, Transport, Information ...)
■ Textiles	
■ Railroads	Random Network
■ Electro-Chemical Industries	Random Network
■ Automobiles/Aviation Industry Network	Random Network/Complex
■ Information- and Communication Technologies	Complex Network

- Wild Forms as Normal Form of Societal Self-Organization, Mild Forms as Marginal
- Wild Forms of Societal Self-Organization and Inequality
- Taming Wild Forms as Big Policy Challenge