

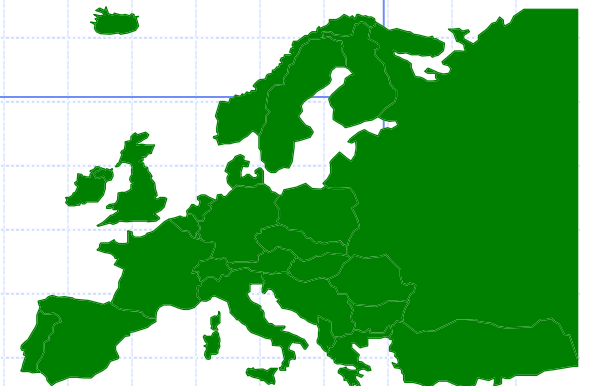
*The 18th International Conference of
The System Dynamics Society*

The predestined fate

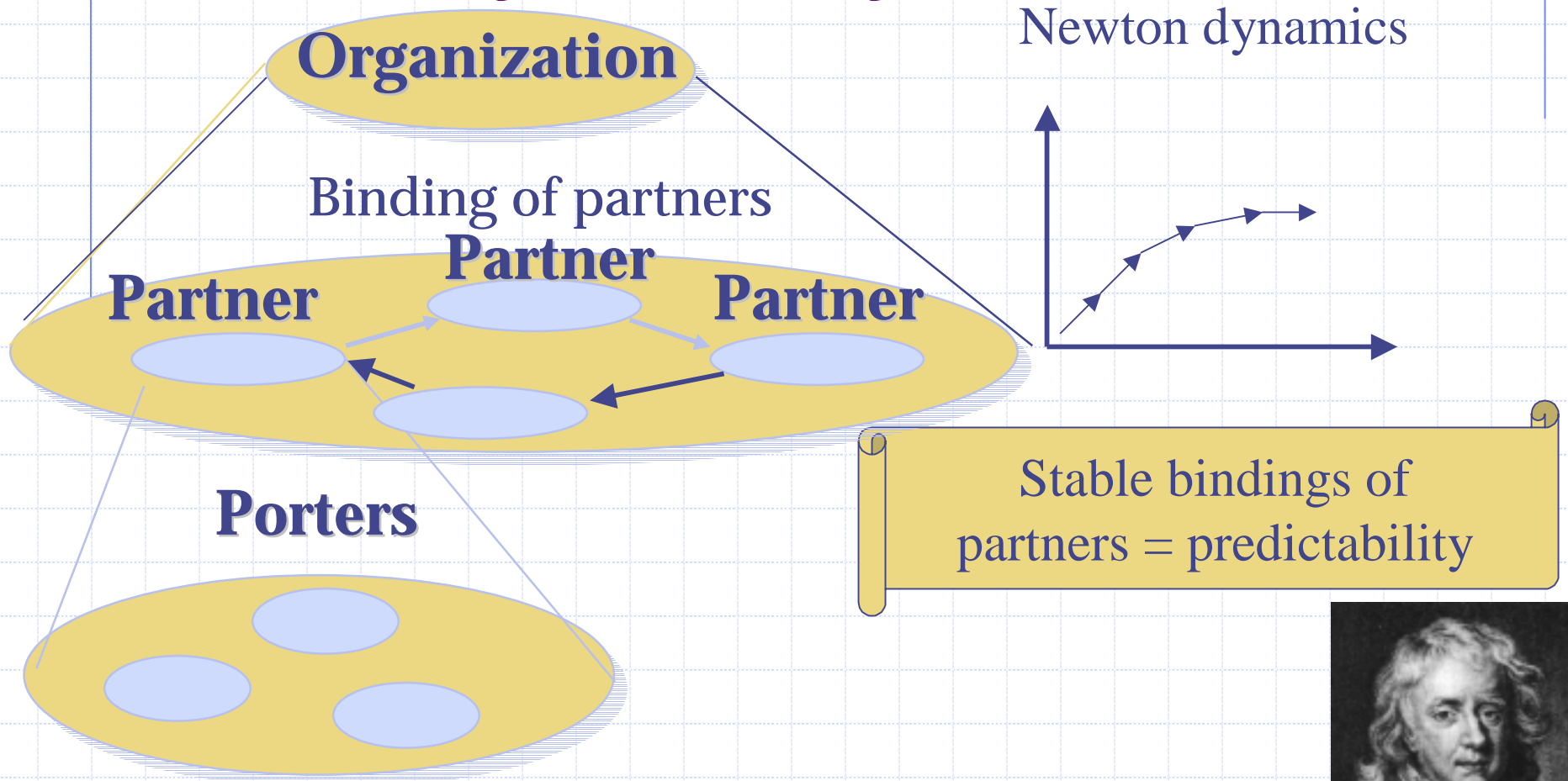
*The Earth nutation as a forced oscillator
on management of Northeast arctic cod.*

Harald Yndestad
Aalesund college

Harald Yndestad, Aalesund
College, Norway



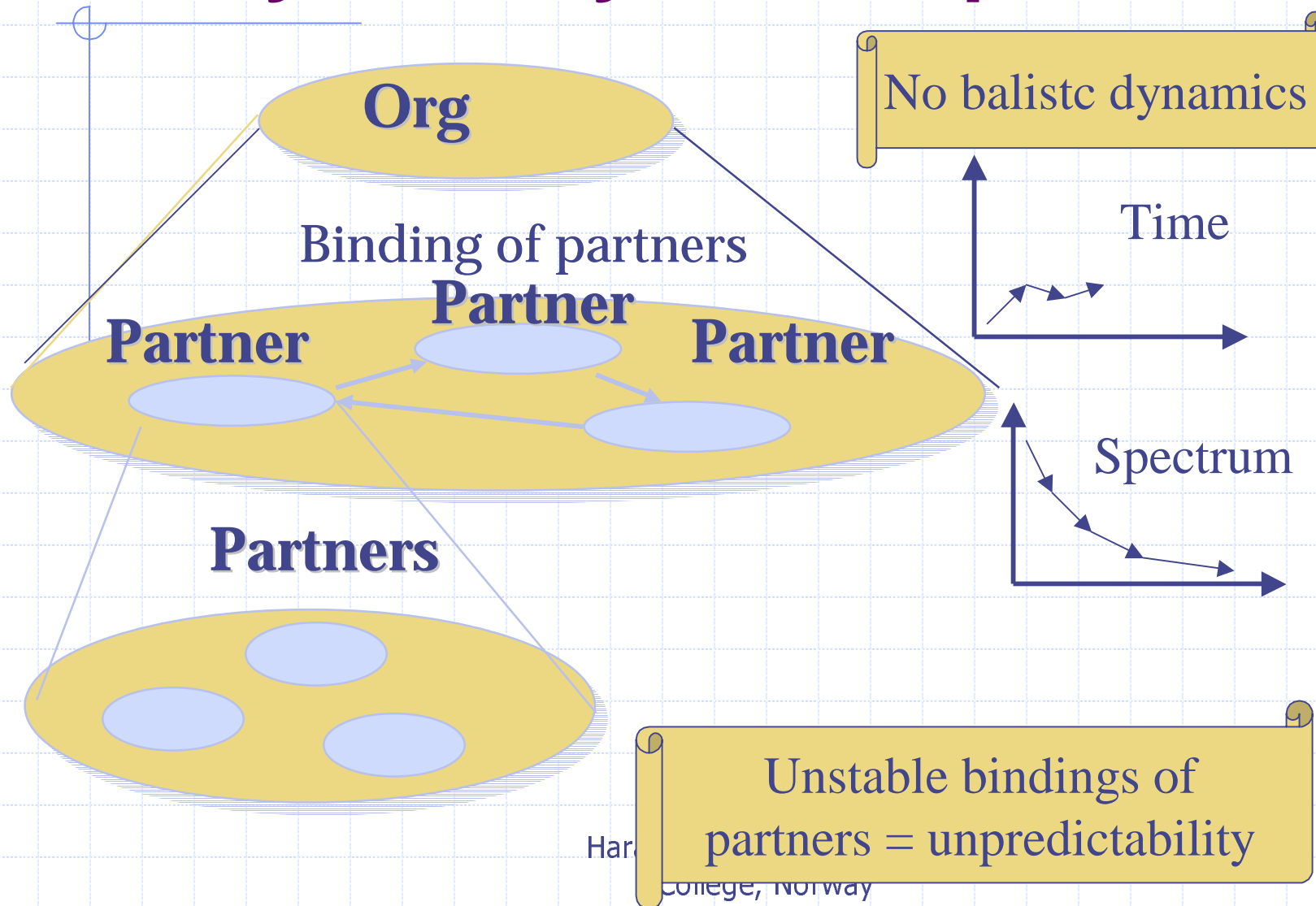
Newton System dynamics



Harald Yndestad, Aalesund
College, Norway



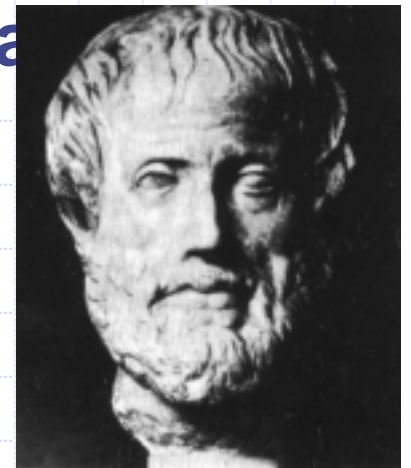
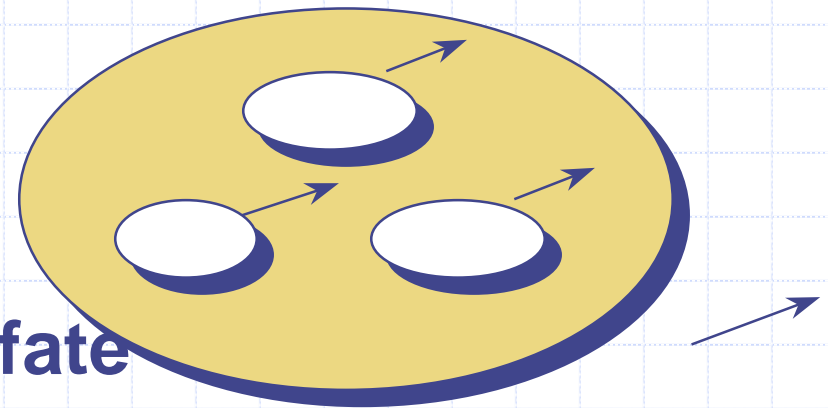
The System dynamics problem



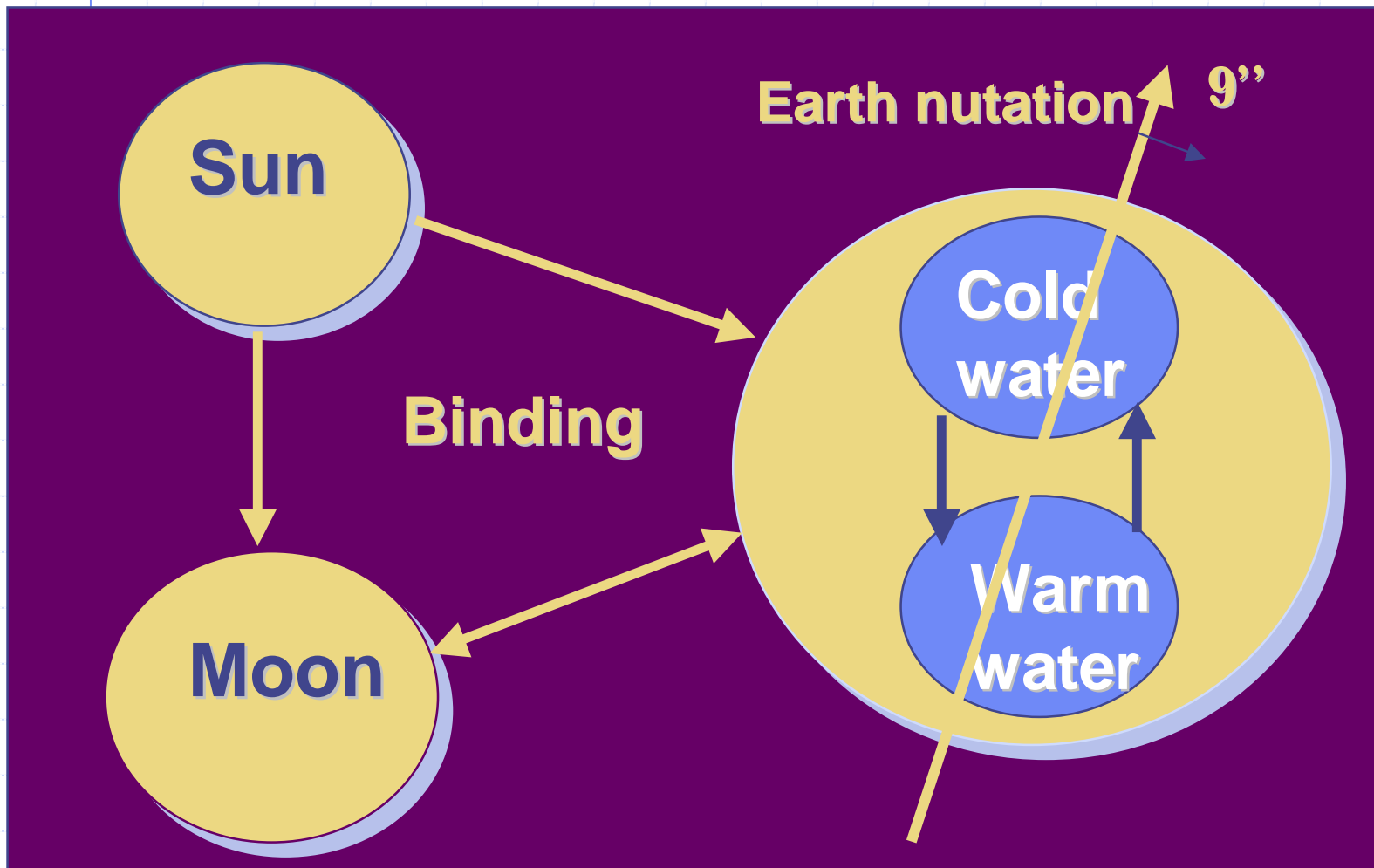
Aristotle system dynamics

System Dynamics: The 4 causes

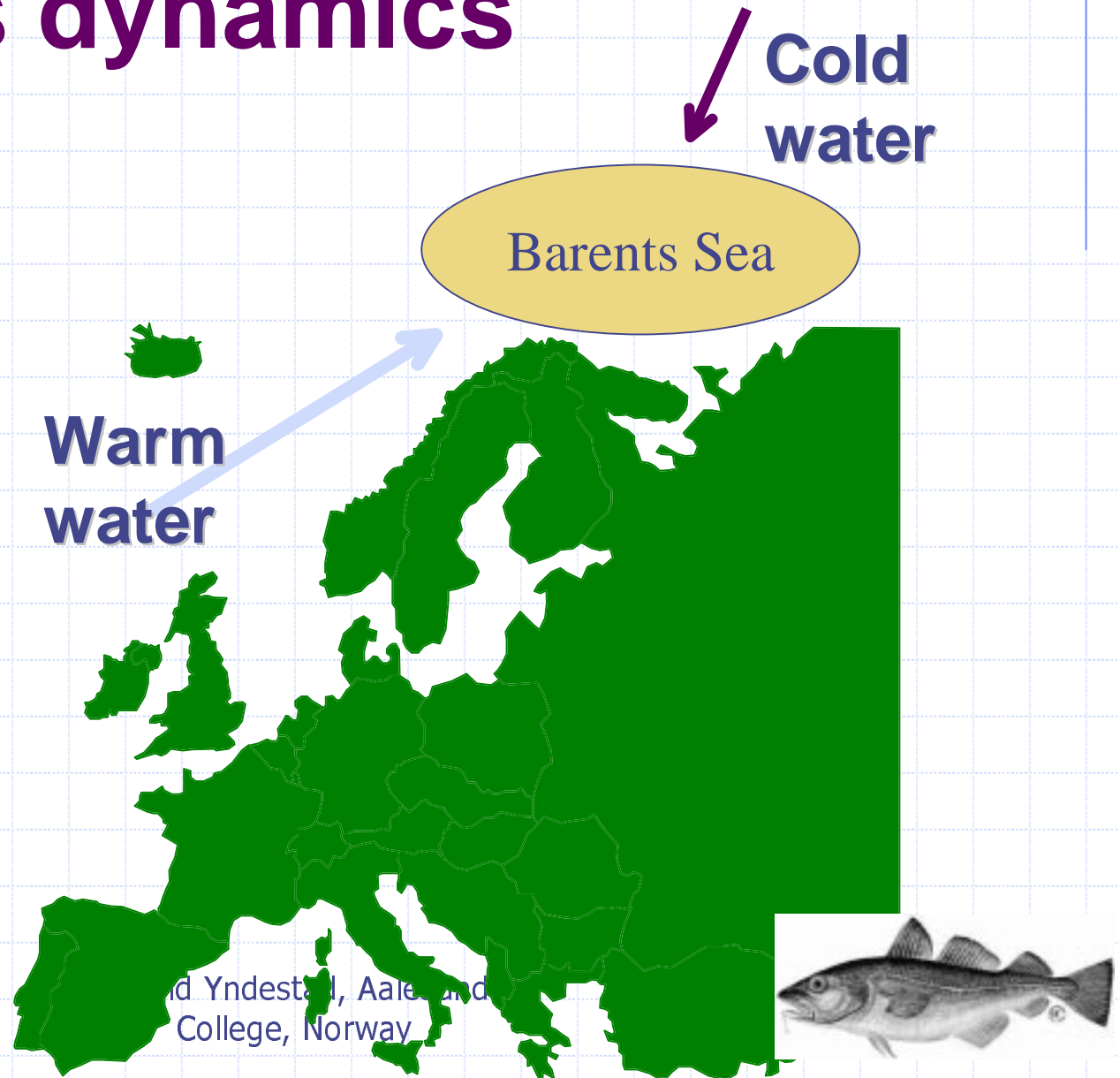
- State before form
- System material
- System structure
- The predestinated fate
- Position of the Moon, Sun and stars



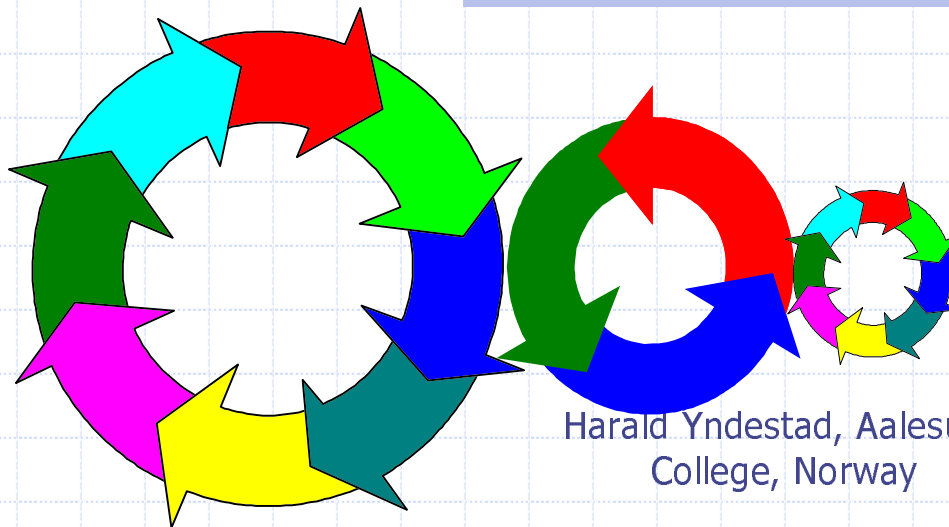
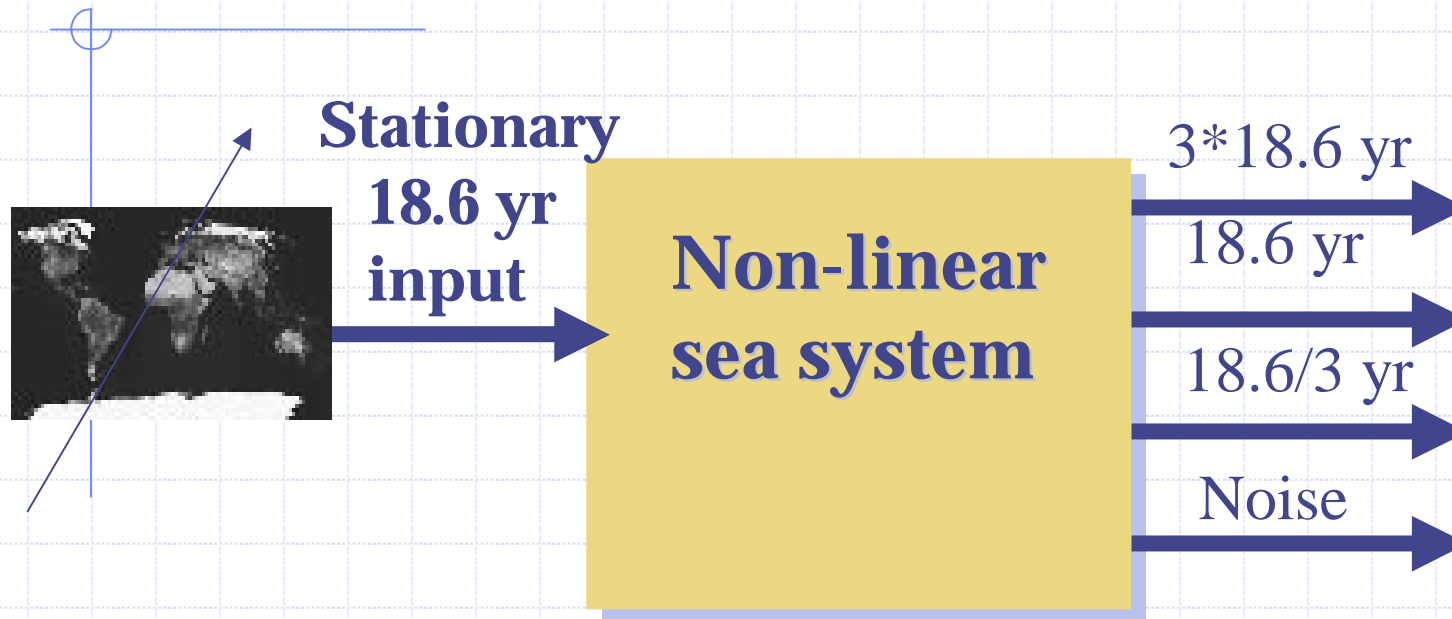
Planetary dynamics



Biomass dynamics

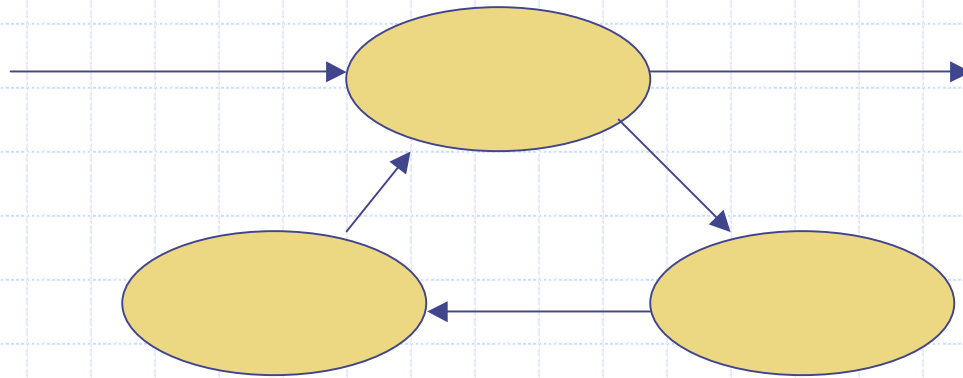


Earth as a forced oscillator



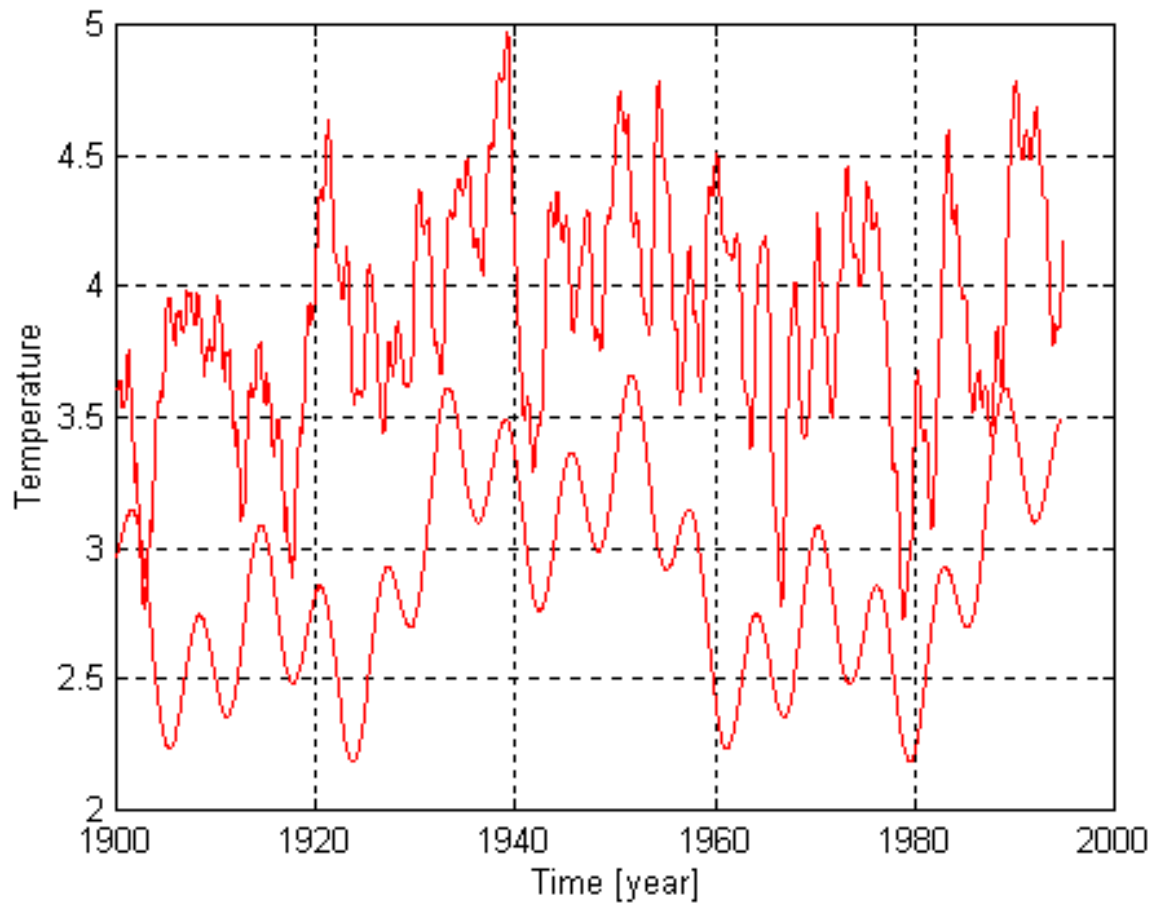
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Stochastic resonance in nature

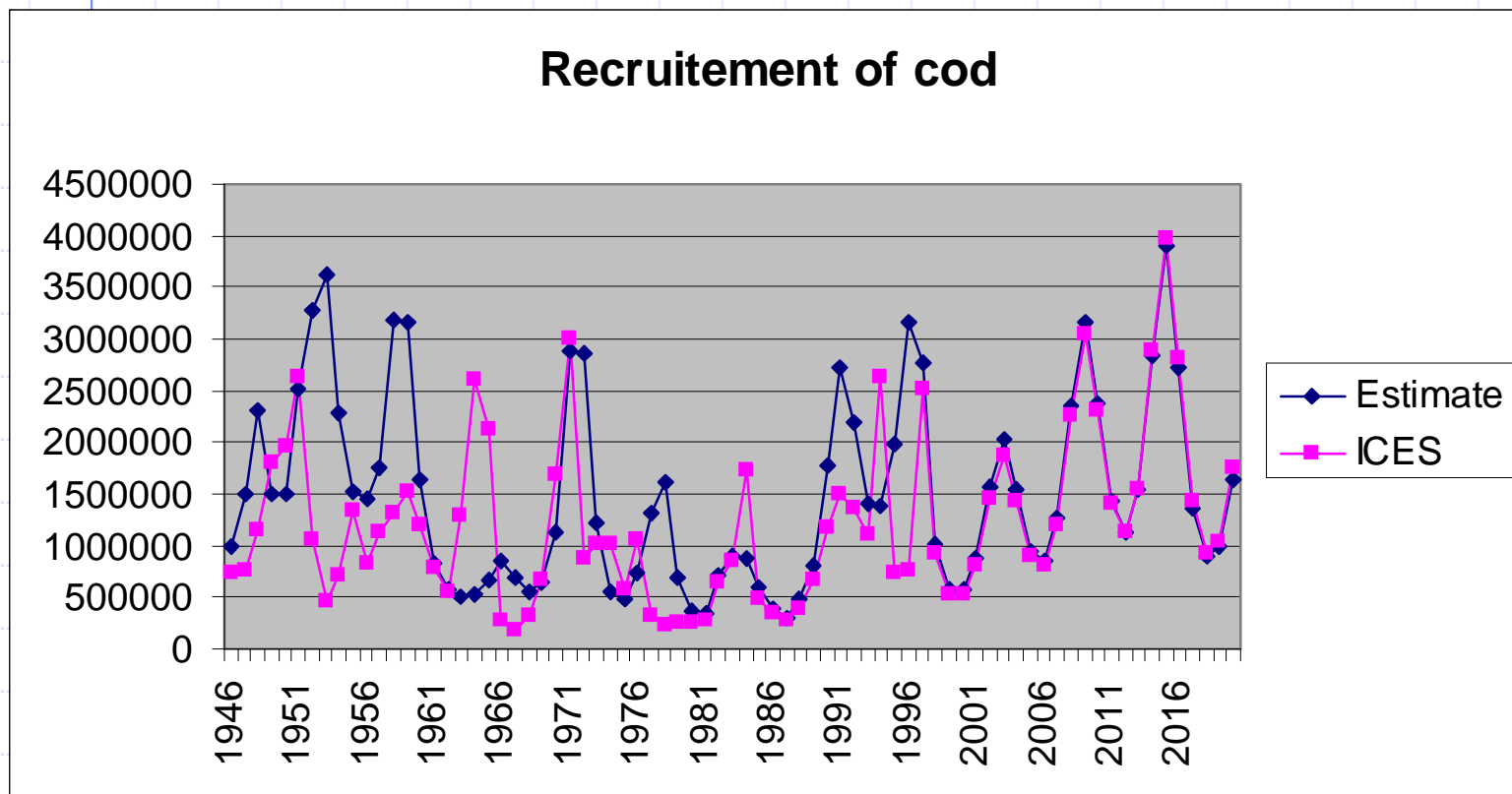


- Theory: Stochastic resonance in**
- Sea temperature system
 - Food chain
 - Biomass
 - Management of cod

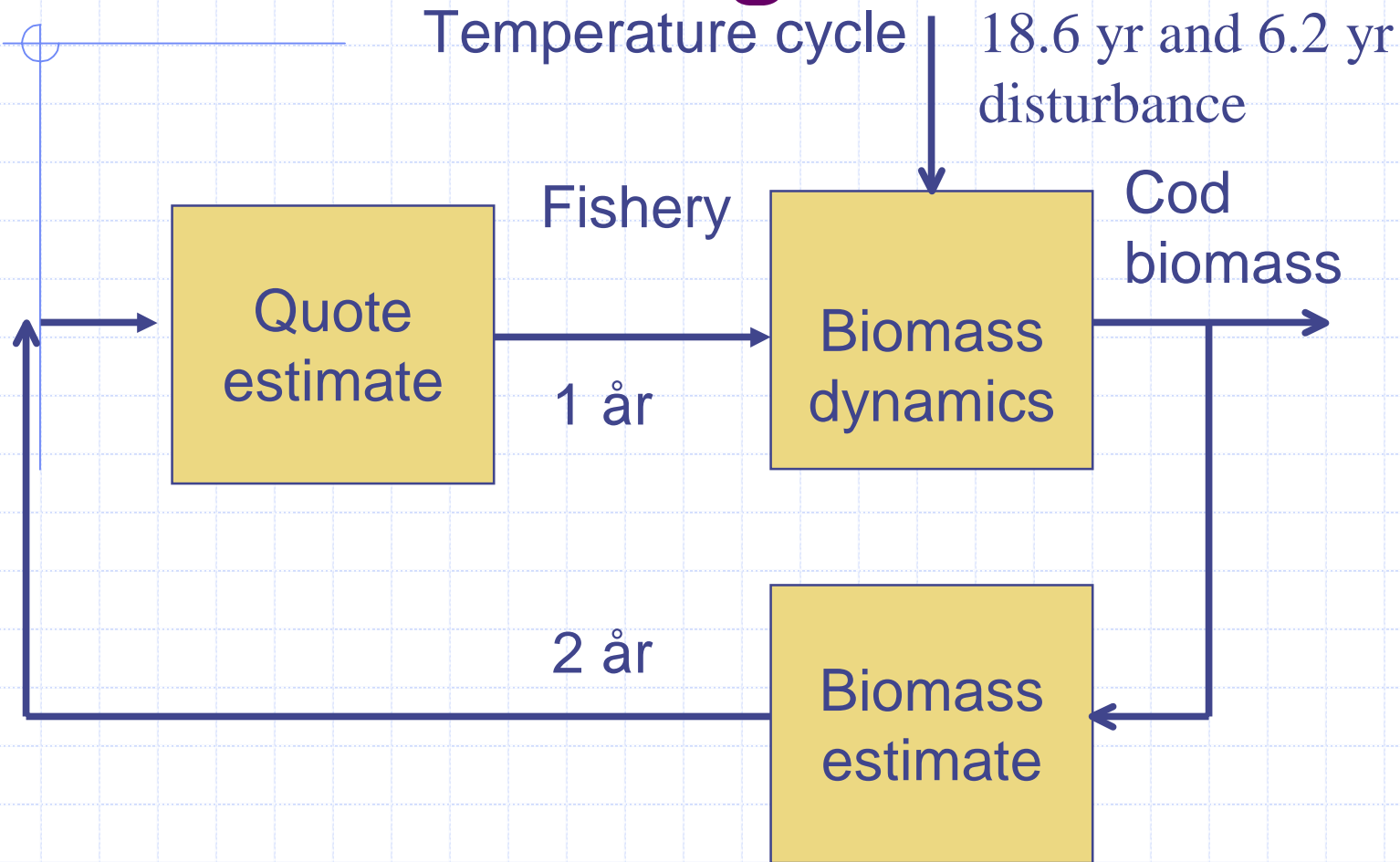
Temperature dynamics



ICES data and forecasting

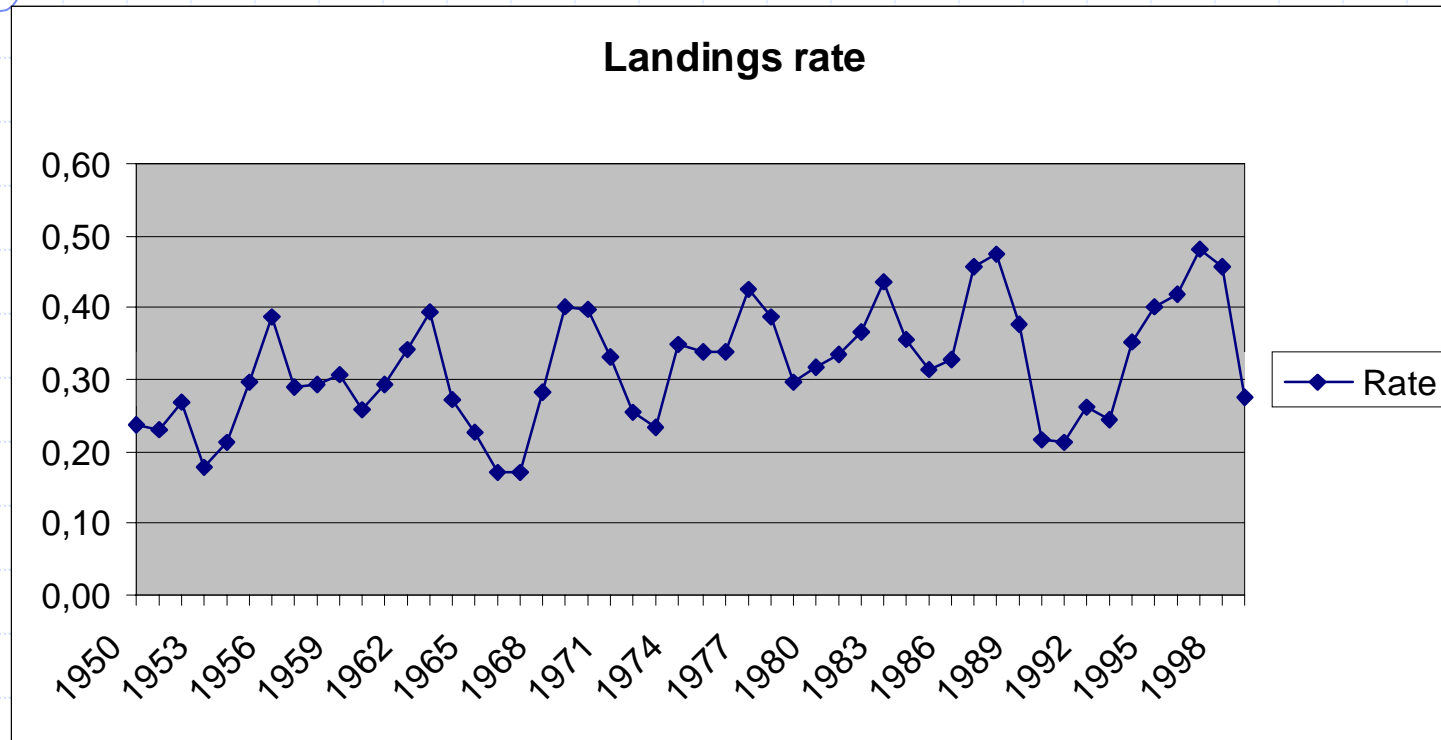


Current management



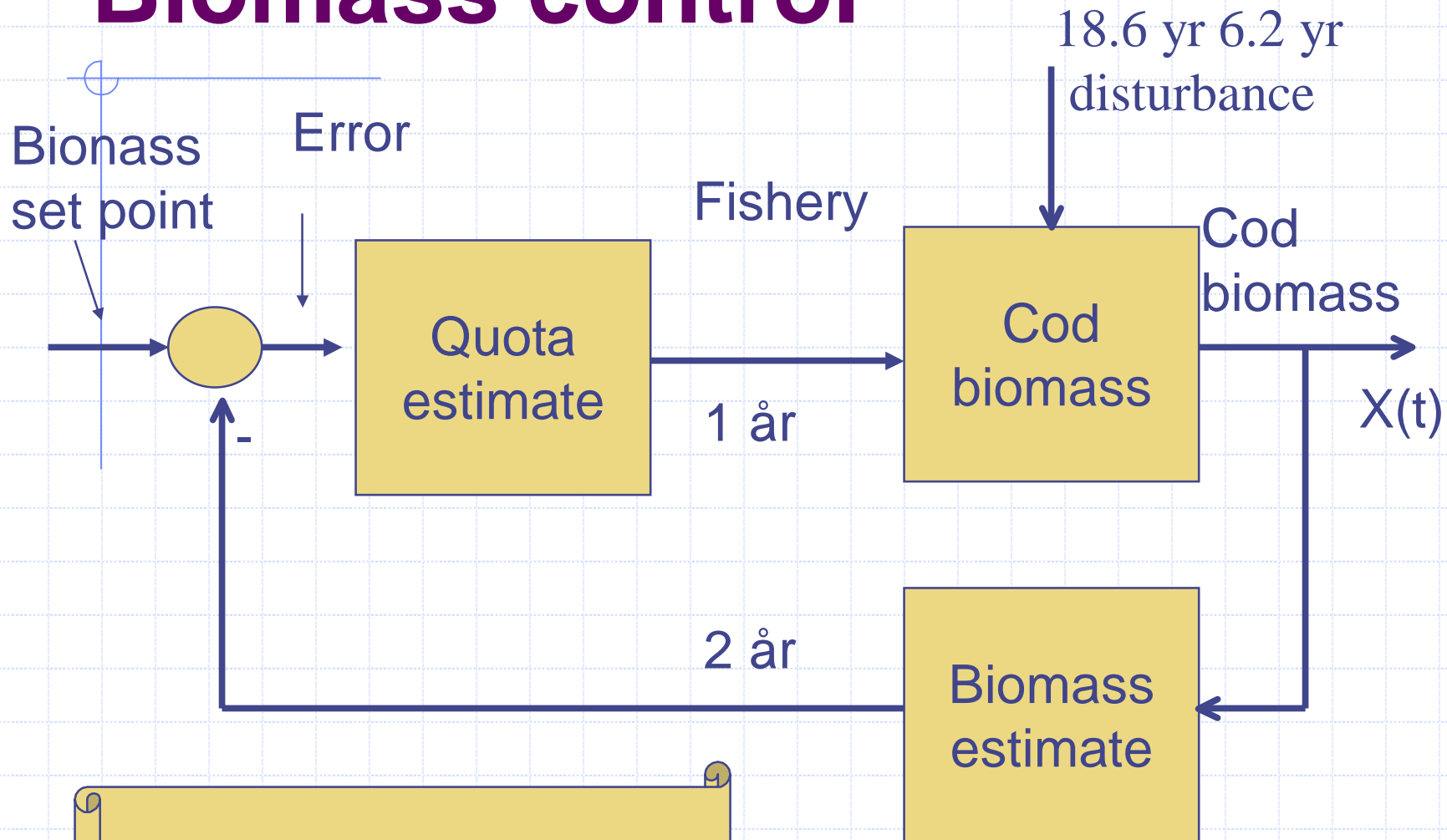
Unstable system

Management dynamics



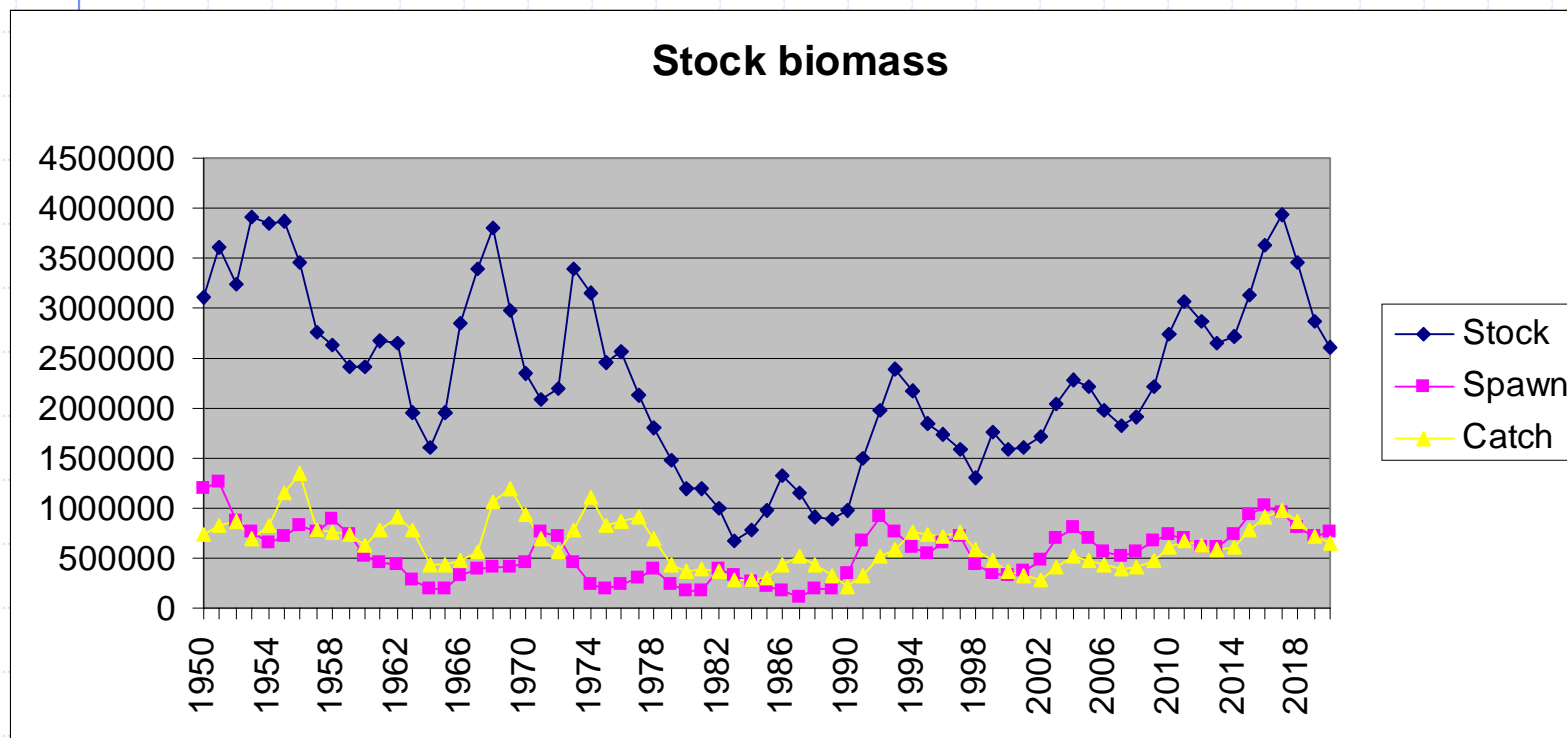
Landings rate = Quota/Biomass

Biomass control



Stable system

Northeast Arctic cod forecast



Harald Yndestad, Aalesund
College, Norway