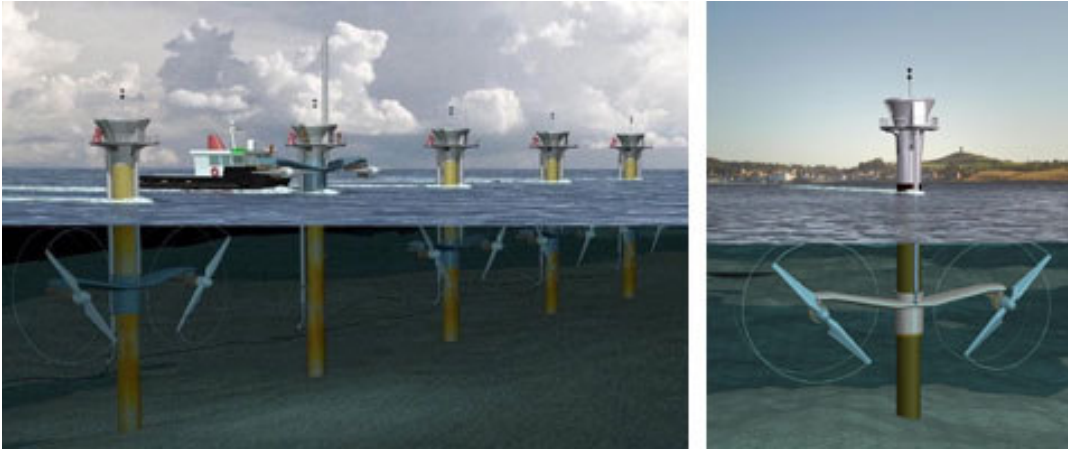


Assessing hydrodynamic modifications affected by tidal energy extraction and their possible ecological consequences (Tidal Energy)

Thursday 5th November

- | | |
|----------------------|---|
| 09.30 - 10.00 | Registration and coffee |
| 10.00 - 10.15 | Welcome and Introduction (Dr. Eric Grist, ERI) |
| 10.15 - 11.15 | Professor Jonathan Side (Heriot-Watt University)
<i>What should we measure, and why, where and how?</i> |
| 11.15 - 11.45 | Coffee/Tea |
| 11.45 - 12.45 | Professor Jonathan Sharples (Proudman Oceanographic
Laboratories) <i>The role of physics in shelf sea ecosystems</i> |
| 12.45 - 14.15 | Lunch (provided in the Exhibition Room) |
| 14.15 - 15.15 | Dr Scott Couch (University of Edinburgh)
<i>Hypotheses on hydrodynamic modifications due to harvesting
of tidal energy</i> |
| 15.15 - 15.30 | Closing Remarks |

Seagen (1MW)



some tidal energy devices

not in any particular order

Open-Centre Turbine



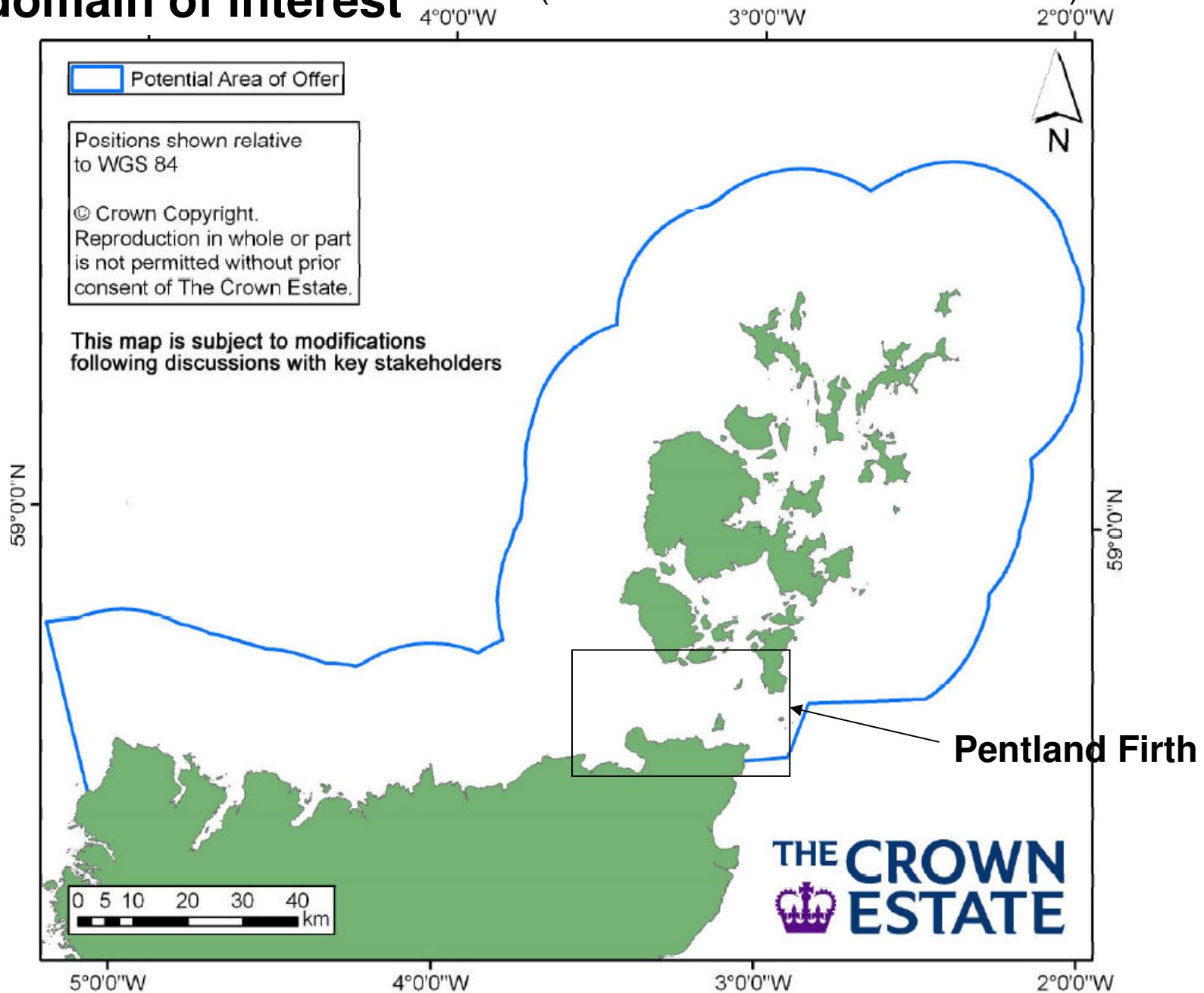
TidEL concept (1 MW)



(From respective websites)

A domain of interest

(From The Crown Estate website)



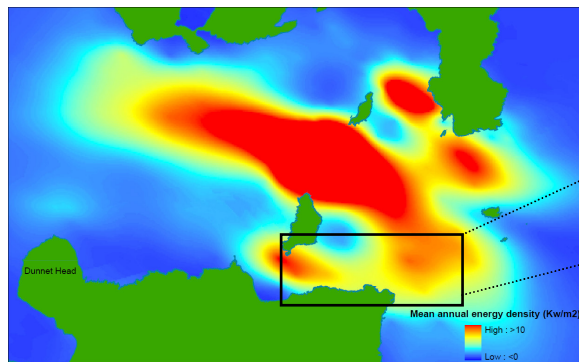
Mathematical and statistical modelling can

- identify questions on planning and potential costs
- estimate ecological impacts of development

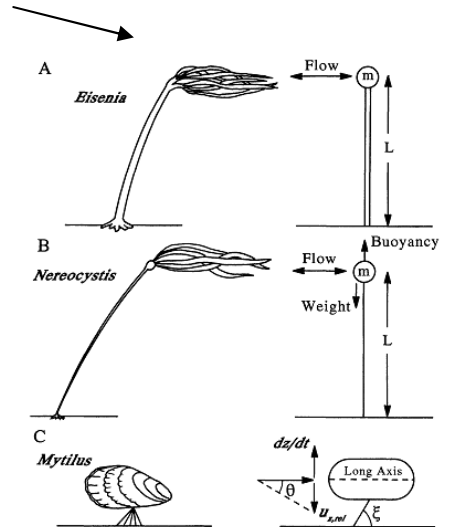
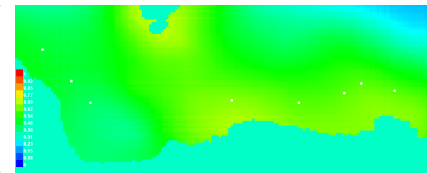
For example

What are the 2D spatial distributions of

Tidal energy (per POLPRED)



Benthic species (per MAXENT)

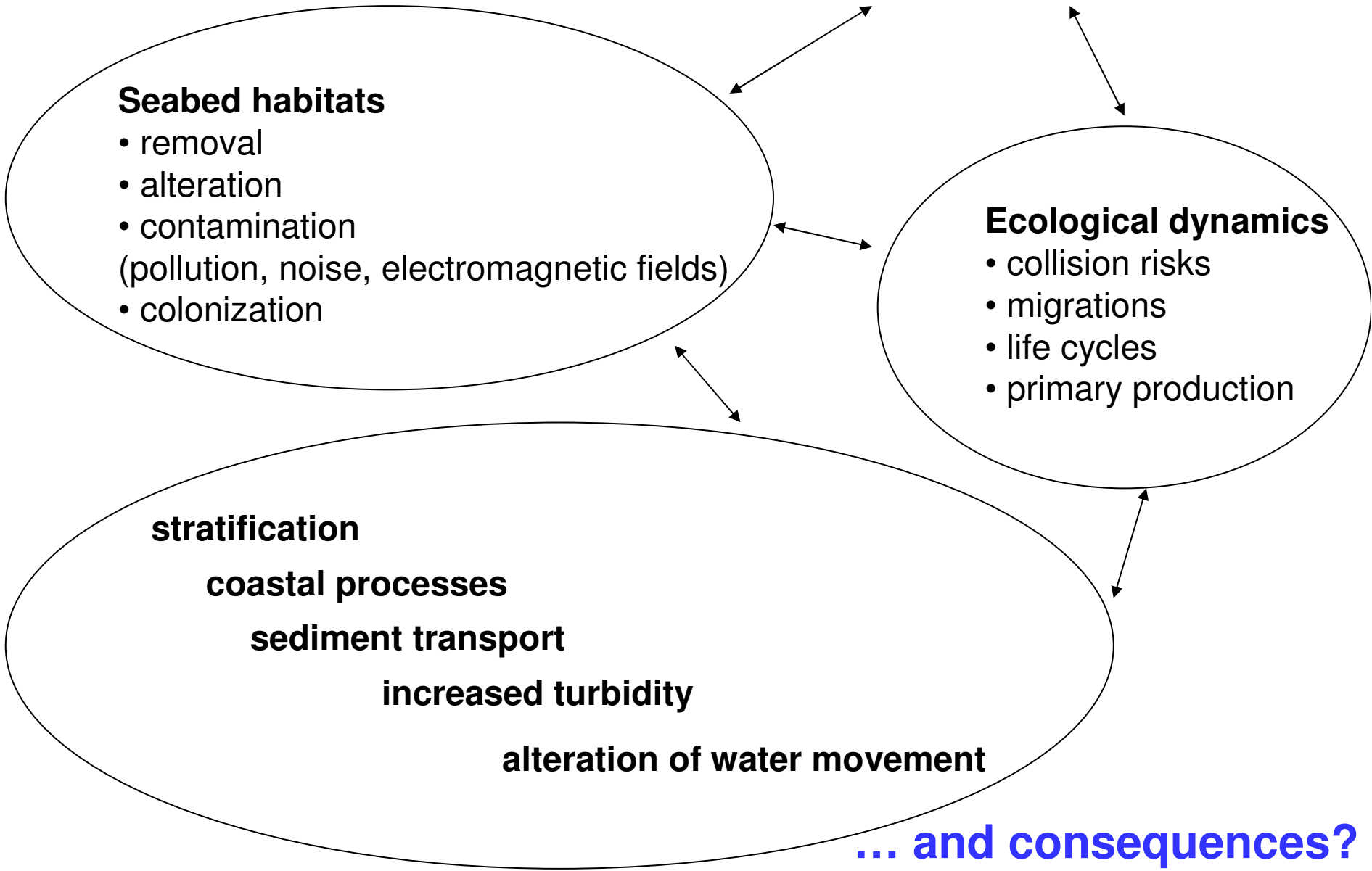


from Denny 1998

3D dynamic?

Hydrographic/Hydrostatic models of tidal areas ?
Ecosystem/NPZ models?

What are the potential impacts of **tidal device installation/operation/decommission on**



Model Uncertainty

Model

- Scale (spatial and temporal)
- Parameter (coefficient values)
- Structural (processes, mechanisms)
- Sensitivity (of predictions to error)

Data

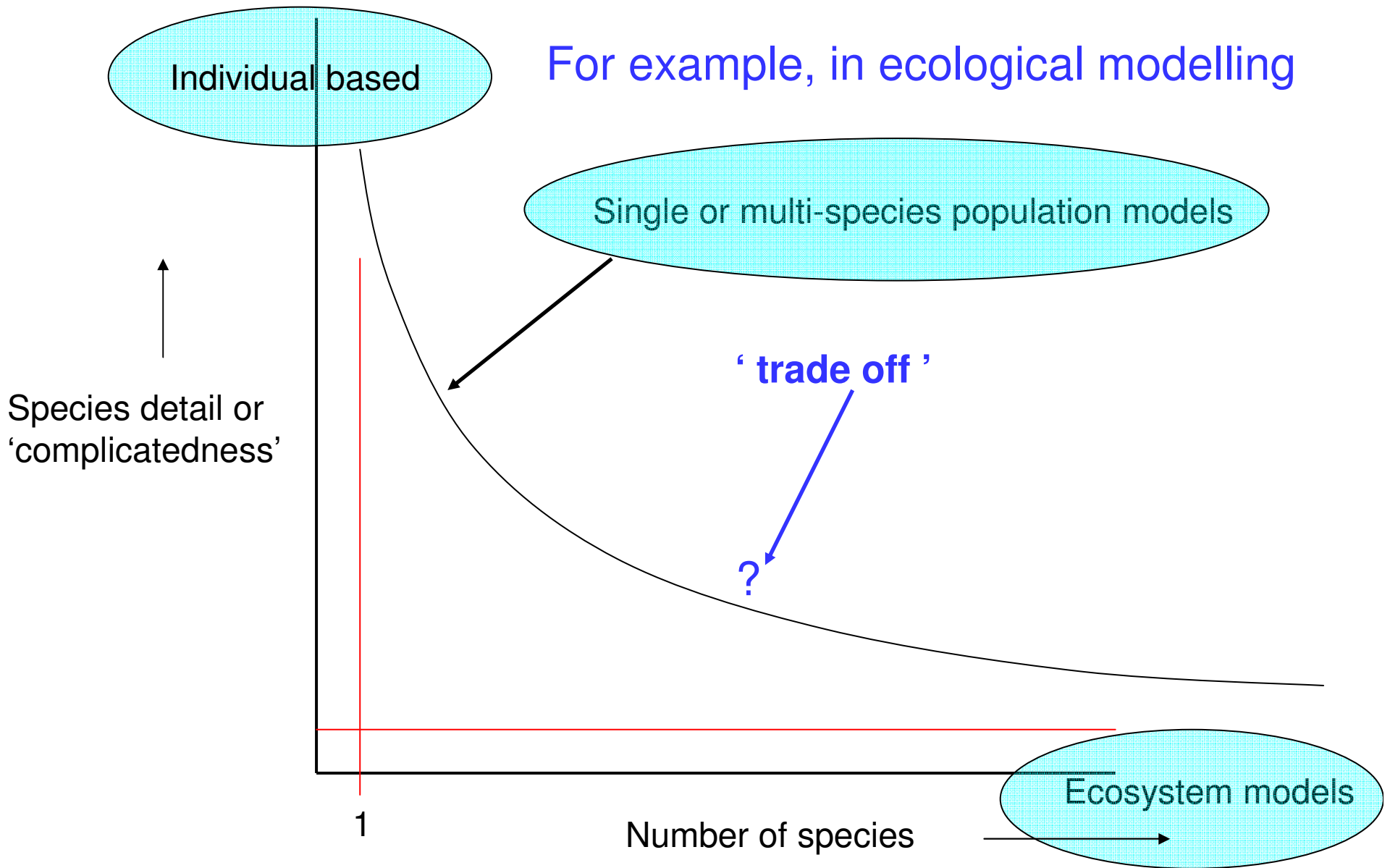
- Biological (all trophic levels)
- Physical (spatial, hydrodynamic, tidal energy)

These features are common to biological systems

- Uncertainty (ignorance)
- Variability (heterogeneity)
- Stochastic effects
- Dynamics
- ‘Stability’
- ‘Behaviour’ (?)

.... what is an optimal model?

For example, in ecological modelling



Workshop Structure (suggested)

- Small groups
- Determine different perspectives
- Identify key questions, issues, methodologies
- Report back