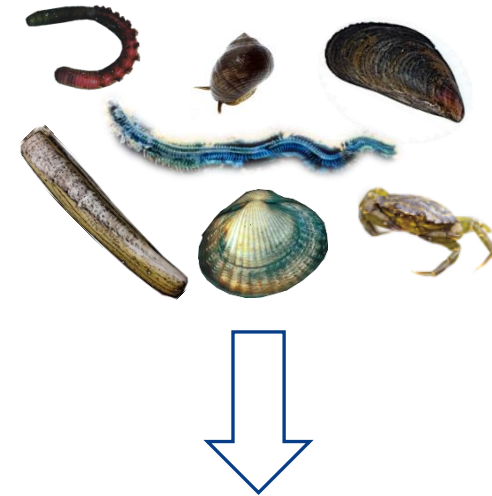


ECSA 56 Coastal systems in transition: From a
'natural' to an 'anthropogenically-modified' state

Food web characteristics of six intertidal habitat types of the Wadden Sea

Sabine Horn, Camille de la Vega, Ragnhild Asmus
and Harald Asmus

Introduction

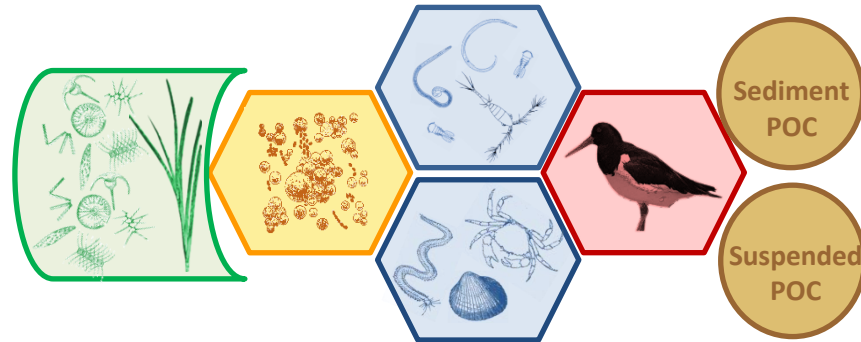
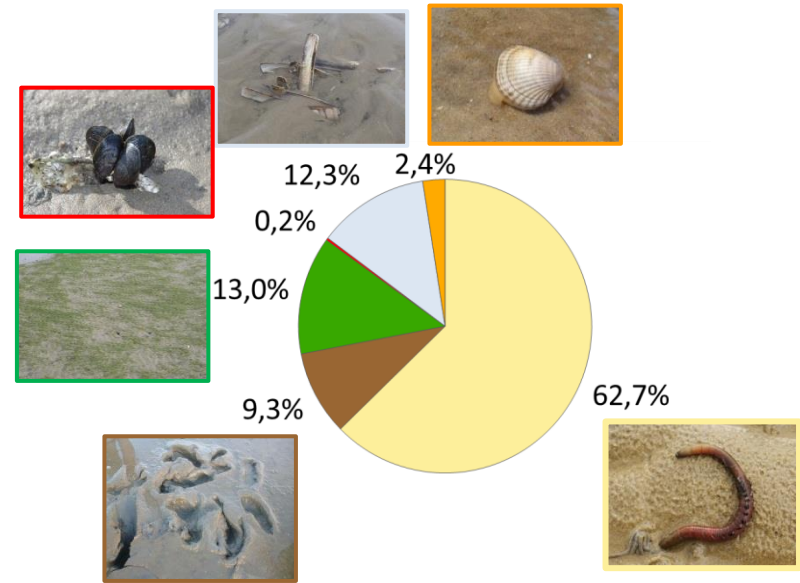
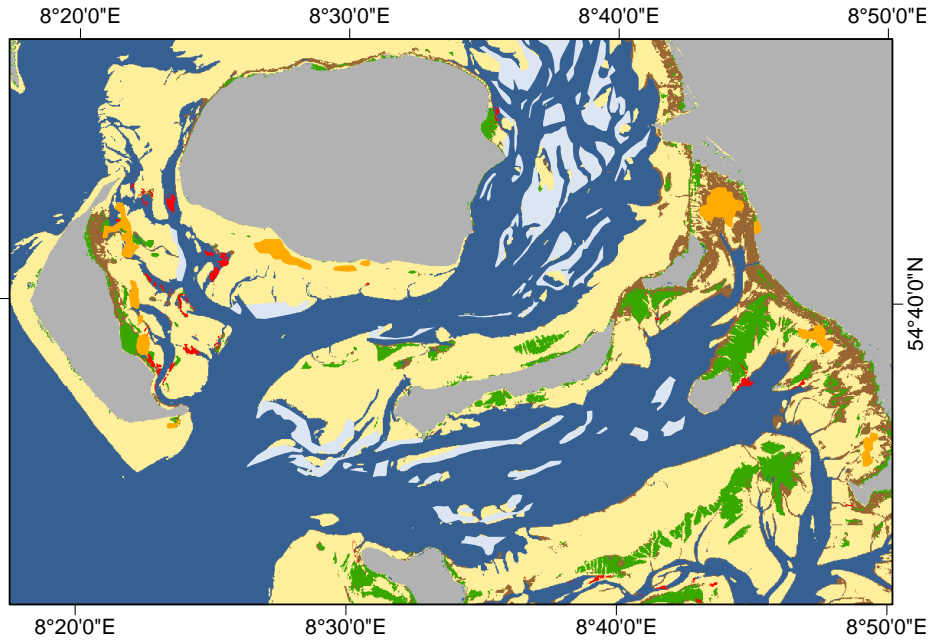


Aim

Food web model of six intertidal habitats

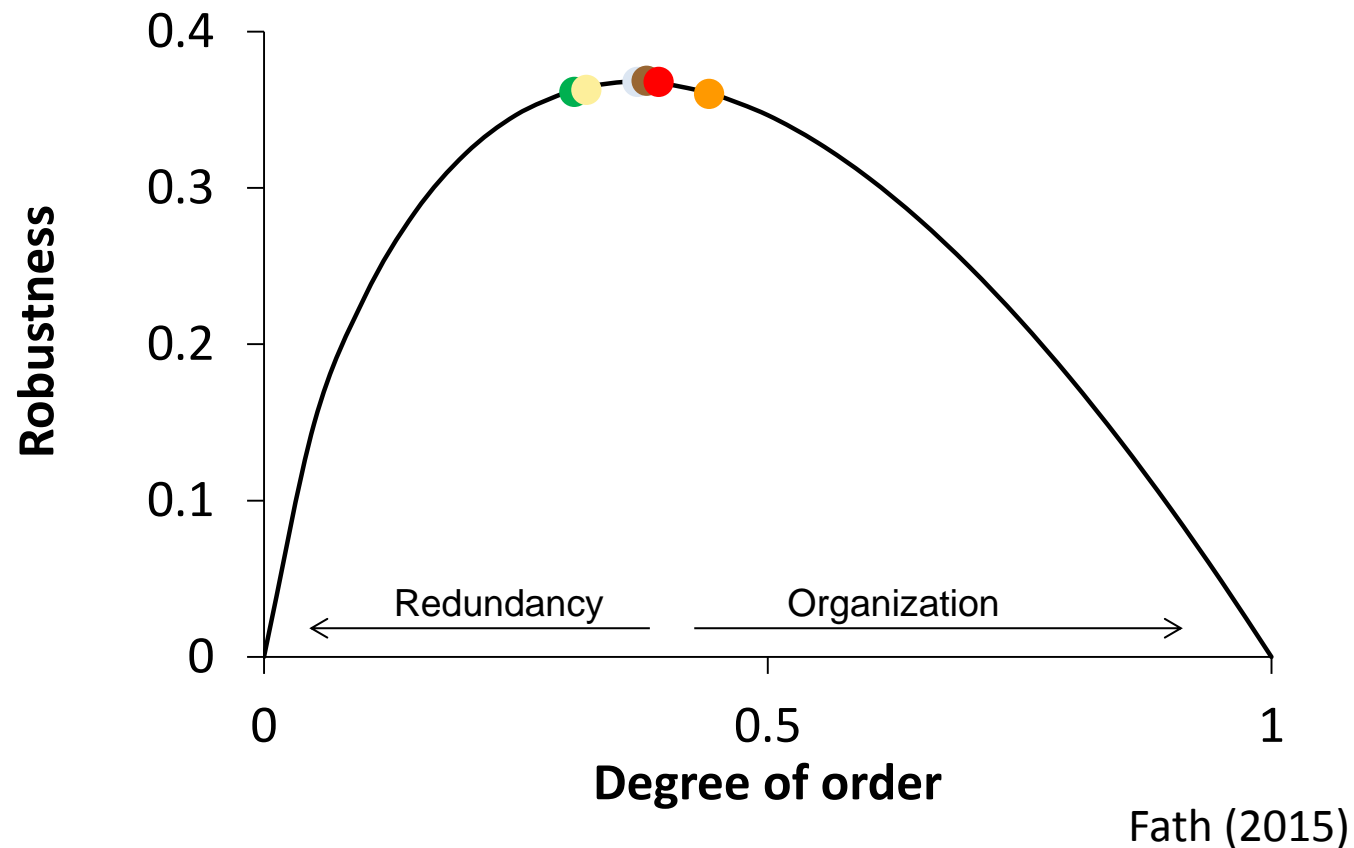
Similarities? Differences?

Study site



Sustainability of the systems

Efficient use energy resources (Organization), reserves of free energy to cope with perturbations (Redundancy)

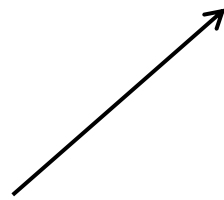


Well-balanced between organization and redundancy

System attributes

Size and activity

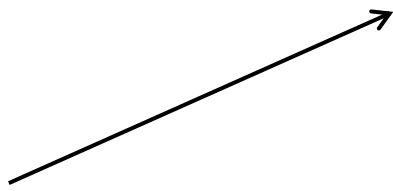
Total system throughput (TST)



Flow structure

Flow diversity (FD): Number of interactions and evenness of flows

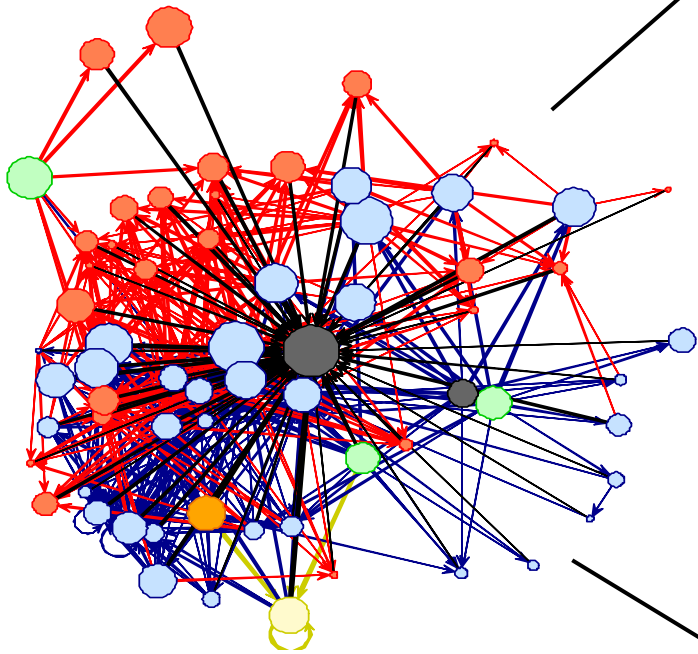
Effective link-density (ELD): Effective number of parallel pathways



Cycling properties

Average path lengths (APL): Mean number of compartments a unit of carbon passes

Finn cycling index (FCI): Amount of recycled material



Cockle field and Mussel bank



TST	ELD	FCI
FD		
APL		



TST	APL	FCI
FD		
ELD		

- Very active and productive
- Complex flow structure -> indicating increased maturity
- Dependent on external imports

Big and diverse systems depending on phytoplankton import

Razor clam field and Mud flat



FCI	FD	TST ELD APL
-----	----	-------------------

- Small system
- dominated by simple links
- short pathways

simple but efficient



TST	-	FD ELD APL FCI
-----	---	-------------------------

- Active and productive
- Simple and short pathways, but little recycling
- Vulnerable to external perturbations

a fragile system

Sand flat and Seagrass meadow



FD	TST	-
ELD		
APL		
FCI		



FD	TST	-
ELD		
APL		
FCI		

- Intermediate systems with high energy reserves
- Complex flow structure -> increased maturity
- Parallel pathways -> robust
- Independent from external imports

Mature and stable systems with high importance for foraging birds

Conclusion

- All systems well balanced
- Characteristic features and attributes



- ➡ Habitat heterogeneity is very important for the functioning of the whole ecosystem

A large flock of birds, likely terns, is seen flying over a body of water. The birds are densely packed in the sky and also on the water's surface. The background shows a low, dark landmass under a clear sky. The text "Thank you for your attention" is overlaid in the center of the image.

Thank you for your attention

The studied area

A mosaic of all habitats



FD	TST	
ELD	APL	-
FCI		

- Intermediate system
- Diverse and complex flow structure
- Robust with high energy reserves

-> mature and resistant system

System attributes Interpreation

- TST -> Wulff et. al. (1989)
- FD -> Christensen (1995)
- ELD -> Ulanowicz et. al. (2014)
- APL -> Christensen (1995), Pockberger and Asmus (2014)
- FCI -> Wulff et. al. (1989), Pockberger and Asmus (2014)