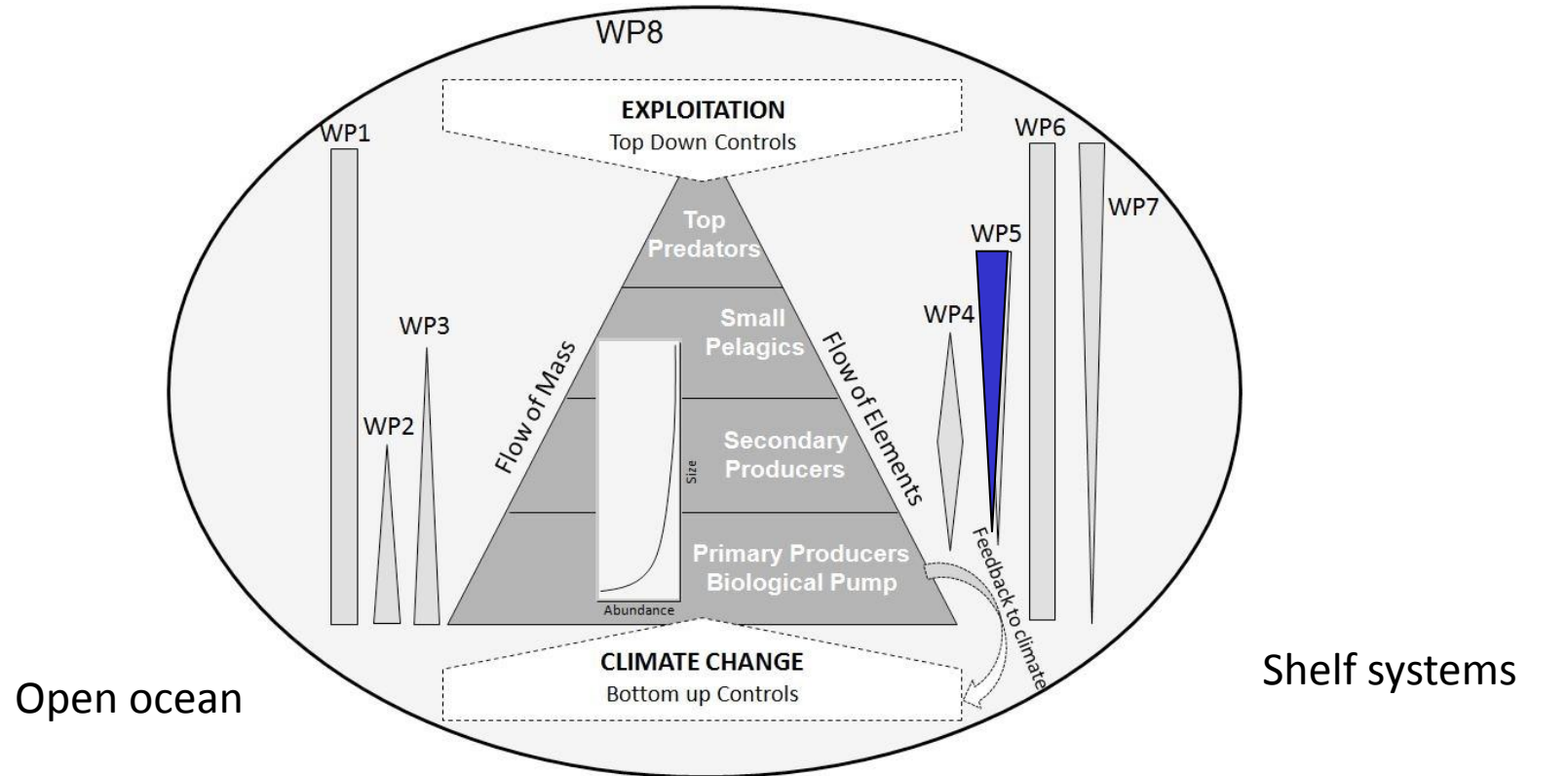


WP5 Dynamics of living resources and their utilisation

Objectives

- To determine the spatial and temporal dynamics of economically and trophically important key fish stocks and top down effects of these fish stocks on ecosystem structure and dynamics in the North Atlantic basin and its regional seas;
- To determine how carrying capacity and trophic controls may change with changing climate and its impact on the production and ecosystem role of these key fish stocks.
- Contribute to an assembly of key species and ecosystem indicators and conduct simulations on their performance under climate change for synthesis in WP8 Advancing Ocean Management

Case studies in WP5



Top predators
bluefin & albacore tuna



top down control on
nekton, **small pelagics**

Small pelagics
herring, mackerel & blue whiting



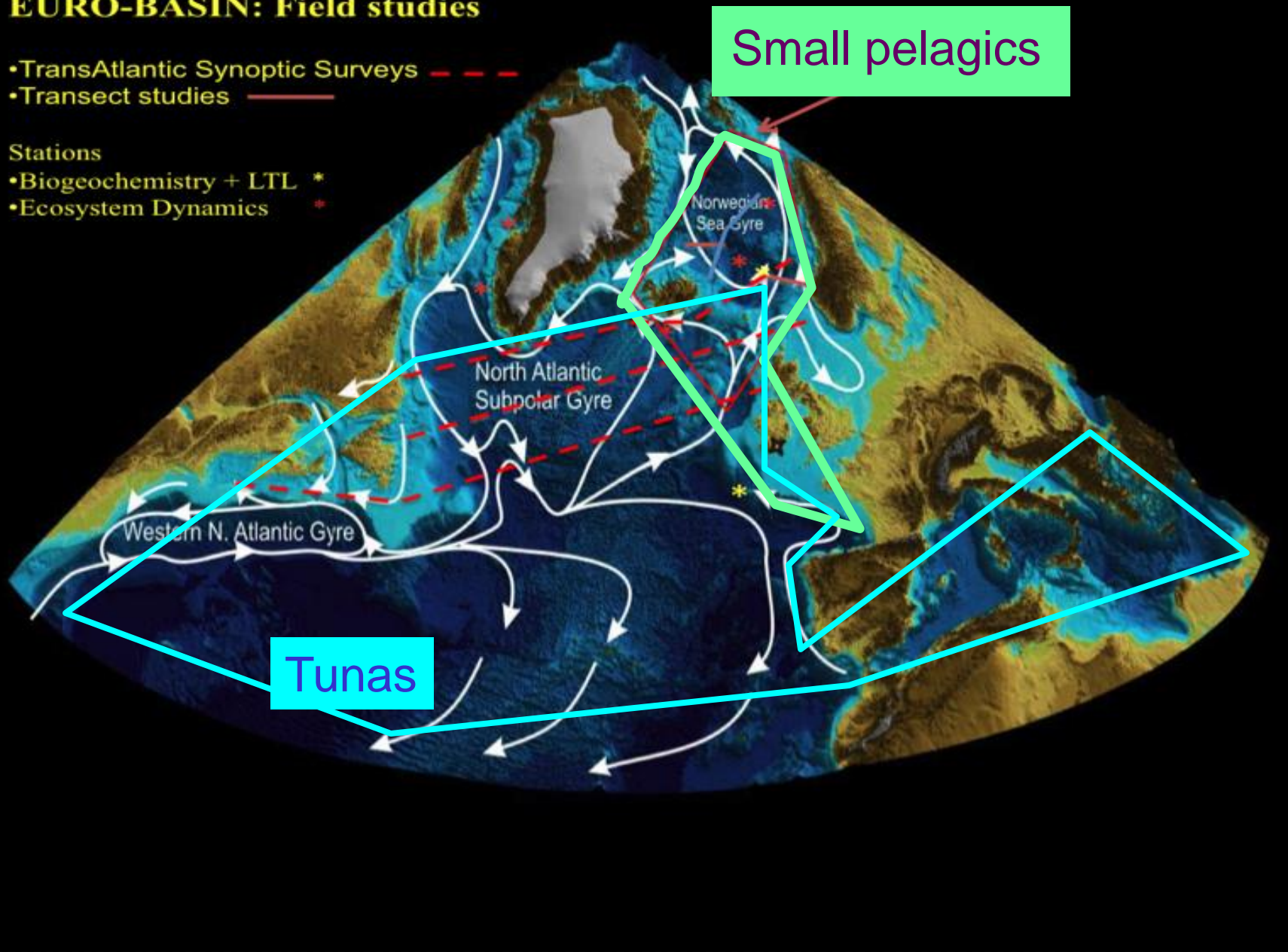
top down control on
nekton, zooplankton

EURO-BASIN: Field studies

- TransAtlantic Synoptic Surveys - - - - -
- Transect studies ———

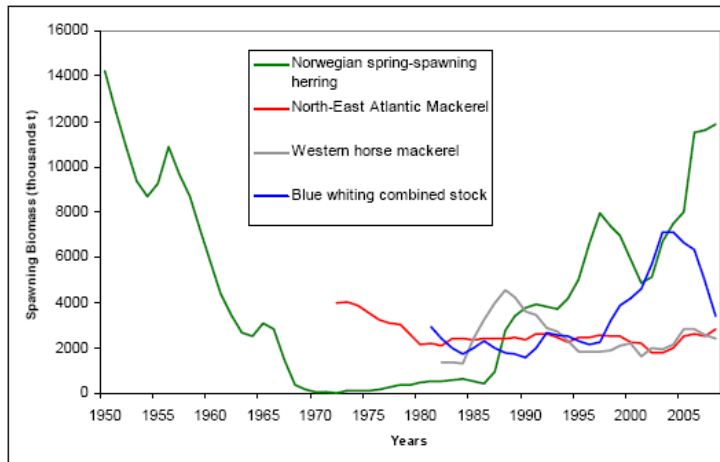
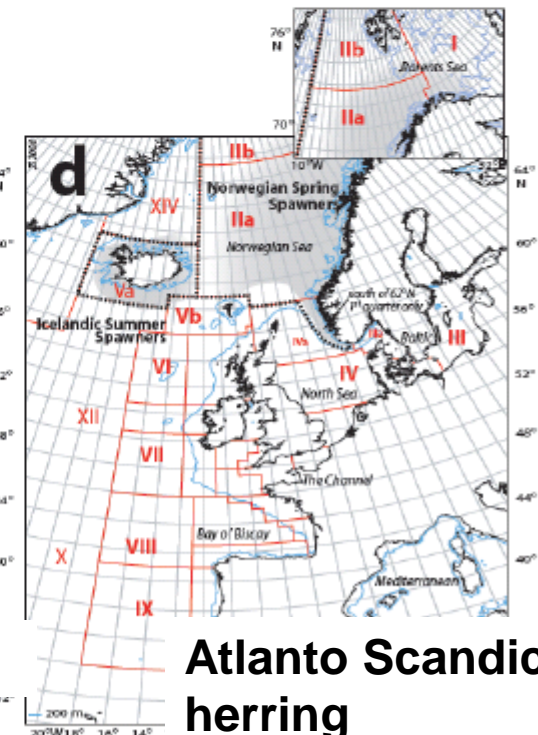
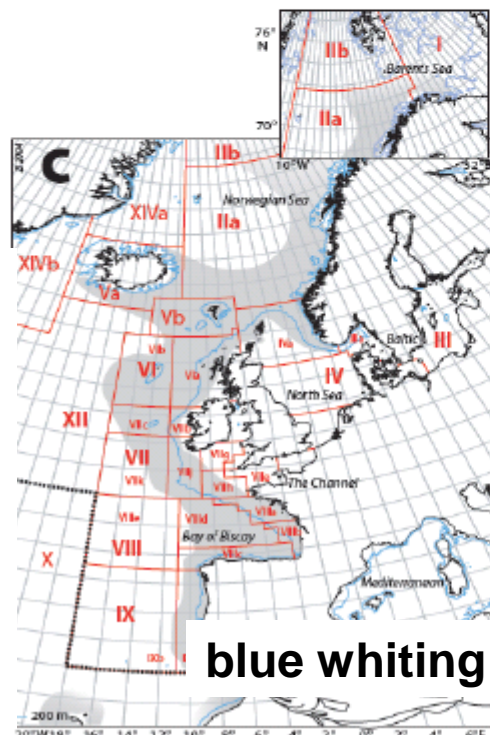
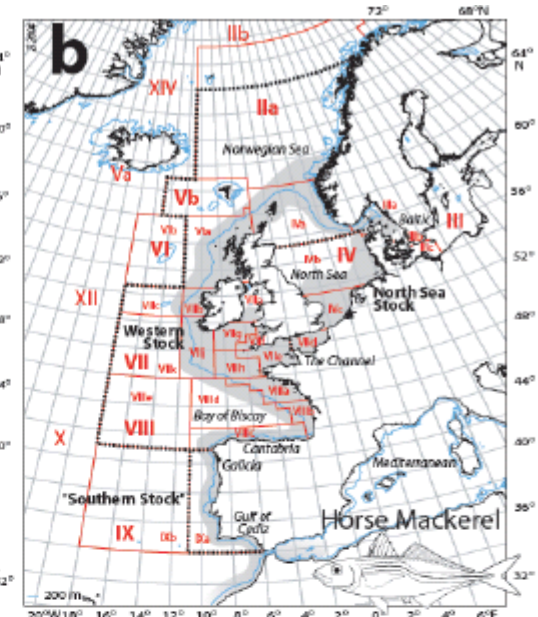
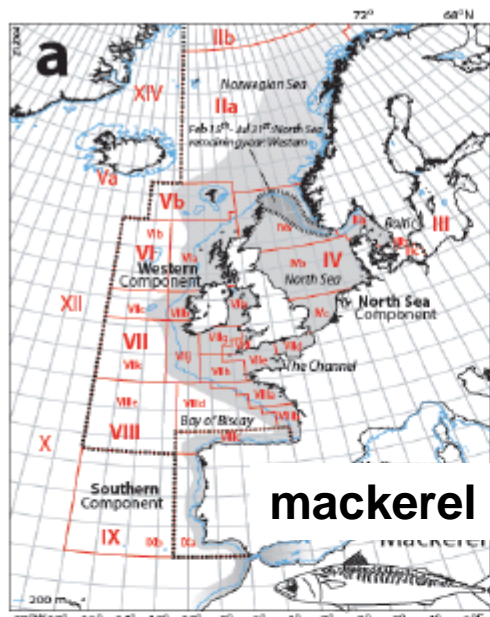
Stations

- Biogeochemistry + LTL *
- Ecosystem Dynamics *



Counterparts in Western Atlantic:

- Herring
- Mackerel
- Atlantic Menhaden



Tasks

Task 5.1 To identify and determine the factors governing the spatial structure of key species populations (leader: IFREMER)

Task 5.2 To identify and quantify the trophic pathways (top down controls) acting upon mid trophic levels as driven by key fish species and fisheries dynamics (leader: IMR)

Task 5.3 To describe and predict fisheries and climate impacts on trophic pathways and ecosystems (leader: DTU-AQUA)

Task 5.1 To identify and determine the factors governing the spatial structure of key species populations

5.5.1 Spatial structure of tuna populations

- Data analysis of bluefin and albacore spatial distributions in North Atlantic
- Parameterisation of SEAPODYM model for both tuna species by fitting to available data

5.1.2 Spatial structure in small pelagic fish populations, Atlanto Scandic herring, blue whiting and mackerel

Herring in Norwegian-Icelandic Sea

- Data collection for herring in (cruise)
- Stomach analyses for herring (standard, molecular,..)

Blue whiting on North East Atlantic shelf

- Statistical data analyses of spatial distribution in selected locations
- Parameterisation of spatial statistical models

Mackerel on North East Atlantic shelf

- **Statistical data analyses of spatial overlap with prey**

Task 5.2 To identify and quantify the trophic pathways (top down controls) acting upon mid trophic levels as driven by key fish species and fisheries dynamics

5.2.1 Top Down Controls: Tuna

- Analysis of tuna diet
- Predator-prey modelling using IBM modelling and SEAPODYM model

5.2.2 Top Down controls: Small pelagic fish, Atlanto Scandic herring, blue whiting and mackerel

- Quantify consumption from field data and modelling
- Spatially resolved size and multi-species modelling for quantifying top-down pressure

Task 5.3 To describe and predict fisheries and climate impacts on trophic pathways and ecosystems

5.3.1 Future projections of trophic controls: Tuna

- Scenario modelling of spatial distribution changes using SEAPODYM, IBM model and habitat models

5.3.2 Future projections of trophic controls: Small pelagic fish, Atlanto Scandic herring, blue whiting and mackerel

- Scenario modelling with bio-physical model integrated with NORWECOM and other spatial and size-structured models
- Model developments to include egg and larval phases
- Press-perturbation analysis of qualitative models for different change scenarios

Main deliverables of WP 5

- Report on existing and knowledge assembled in EURO-BASIN on factors driving spatial distributions of key pelagic fish**
- Report on top down trophic control of key pelagic species on lower trophic levels based on existing and knowledge assembled in EURO-BASIN**
- Report on predicting impacts of changing climate and fisheries on predator-prey spatial distributions and trophic interactions**