

Focus Questions

Defining spatial structure

How should management unit boundaries be defined for assessments, reporting, and management?

What types of information should be used to define spatial structure?

How should multi-disciplinary information be integrated to determine spatial structure?

Can routine stock assessment information (fishery catch, fishery-independent surveys, composition) be used to define spatial structure?

When should spatial structure be interpreted as sub-stocks versus fisheries?

Do we need to change spatial structure definition over the time series explored? If yes, on which criteria?

Movement data and theory

What are the motivations and mechanisms of fish movement?

What type of movement is most common for marine (large pelagic) fish stocks: advection diffusion, ontogenetic migration, seasonal spawning migrations, spawning site fidelity?

What data can be used to estimate movement?

Are movement patterns (in large pelagics) temporally stable or variable over time?

Different species move at different spatial scales: what are the population/ecosystem implications of this?

What determines the scales over which marine species move?

How might movement (e.g., spatial foraging, migration, etc) affect population dynamics?

Spatial stock assessment models

Which processes a spatial stock assessment model should include (a minima)?

When can the areas as fisheries approach adequately deal with spatial structure?

What spatial domain are non-spatially structured models (including areas as fisheries approach) implicitly measuring?

How to compare spatial vs non-spatial assessments (diagnostics)?

Is it necessary to capture spatial variability in biological processes (e.g. growth) and if so, how?

When should movement rates be assumed to be constant or time-varying?

How should movement or mixing be modeled for early periods with little information on mixing or movement?

Integrating tagging data

Should tagging data be integrated into the assessment model or be analyzed externally?

What are the pros and cons of allowing tagging data to a) inform movement estimates only and b) inform fishing mortality and abundance also?

What are the appropriate diagnostics for tagging data to ensure assumptions are not violated?

How can integrated tagging models be used to help design tagging experiments?

Other information (to include in the assessment model)

What data provides information on movement and mixing rates?

What is the best data to determine mixing rates in catch?

When should a spatial assessment be conducted if there are no tagging data?

How should sympatric populations (exist in the same geographic area) be modeled?

Applications

Why are spatial assessment not used more?

How should stock structure be addressed when management units do not represent biological populations?

What data in current integrated spatially-structured assessments tend to inform movement?

What is the most important sign/diagnostic that suggests a spatial assessment is needed?

How should 3-dimensional (i.e., depth-based) or 4-dimensional (e.g., temperature) stock boundaries be addressed?

How should spatial distribution shifts be accounted for (retrospectively, prospectively)?

Management implications

When does spatial management matter?

How to interpret stock status in spatial context?

How should performance relative to management objectives be evaluated?

'Stock' between a rock [habitat/ecology] and a hard place [political]: what are the best approaches for translating spatial stock assessment output into pre-existing management units for decision-making (e.g., OFL specifications)?

How should uncertainty within and among spatial units be translated into harvest buffers (or HCRs; spatial or aggregated) aimed to account for such uncertainties?

What are best practices for allocating harvest among spatial population units (with and without a survey) given possible time-varying aspects of stock structure, production, and fleet dynamics?