



Food and Agriculture
Organization of the
United Nations



Centre for Environment
Fisheries & Aquaculture
Science

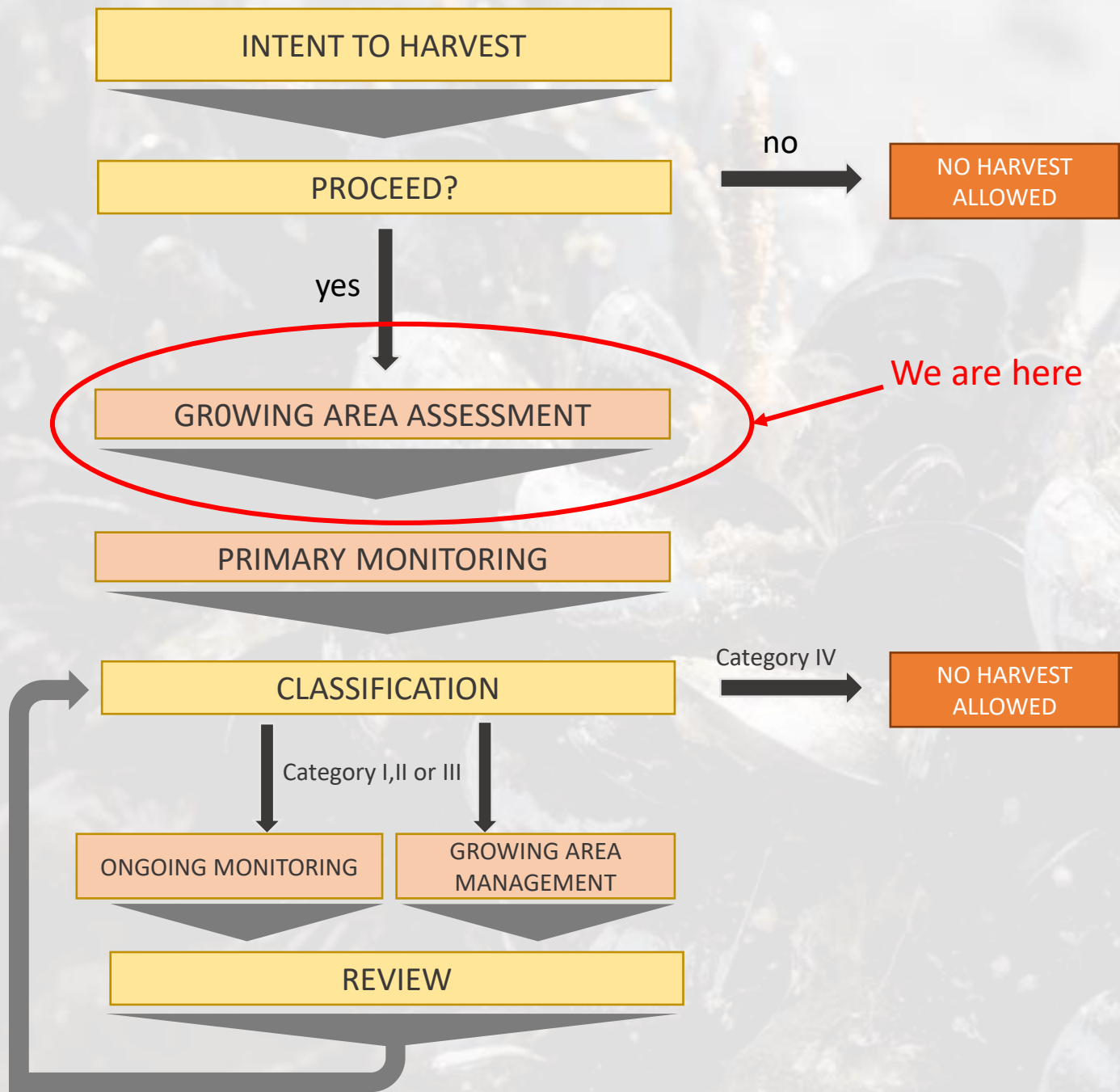
Atelier de formation sur le profilage des risques et l'assainissement des coquillages
bivalves avec l'appui du Centre de Référence de la FAO

21-23 février 2023

Sénégal

Growing Area Assessments

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Components of a Growing Area Assessment

- Start with Growing Area Risk Profile
- Additional data gathering
- Shoreline survey
- Indicator/hazard survey
- Data analysis and assessment
- Outcomes
 - Extent of classified growing area
 - Recommendations for primary monitoring
 - Risk management plan
 - Documentation



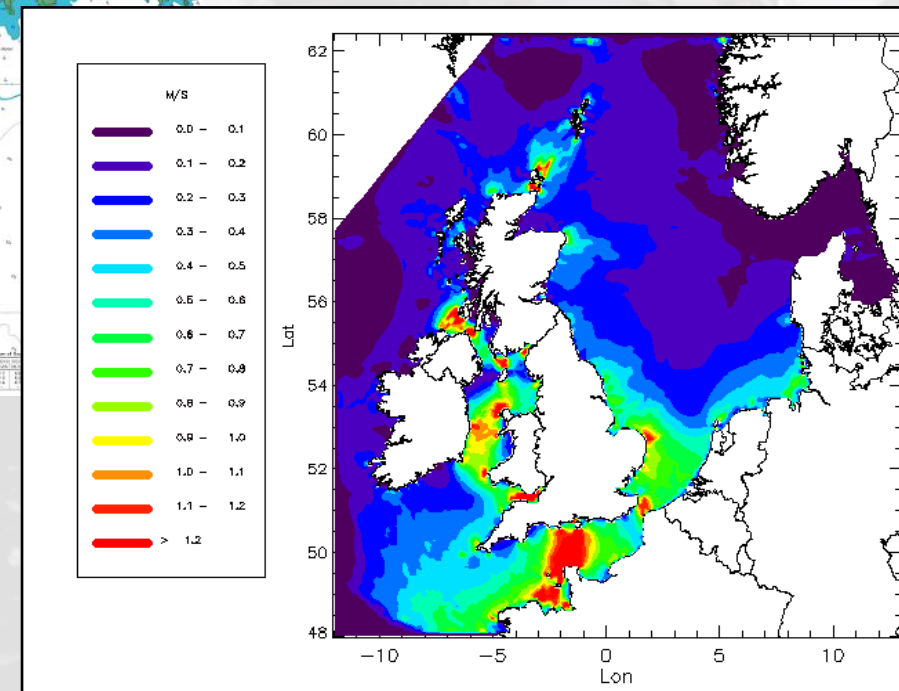
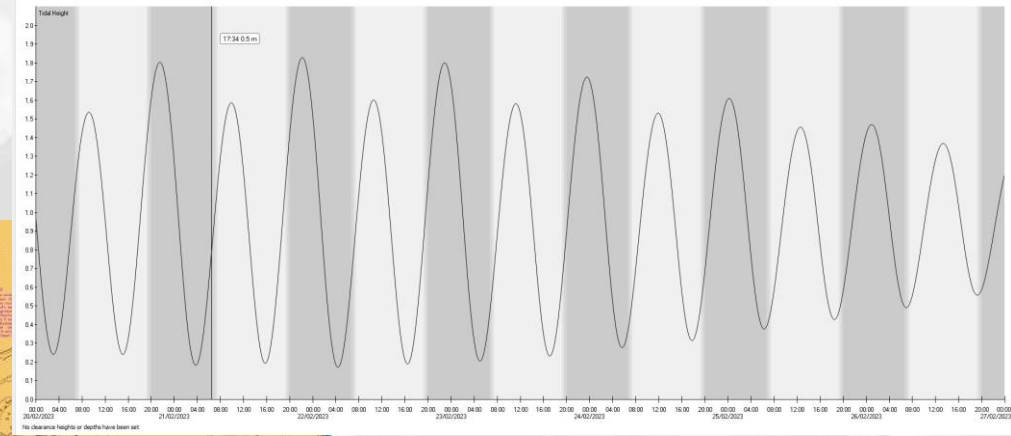
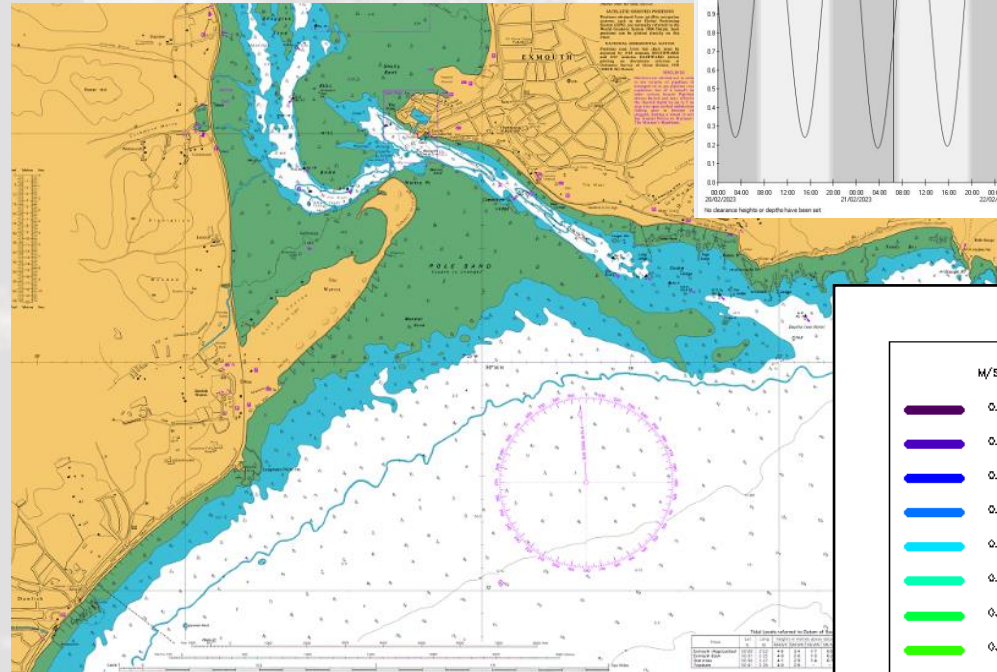
Data Gathering 1– Human Impacts

- Sources of contamination
 - Human sewage
 - Treatment works
 - Sewerage systems
 - Sludge handling
 - Direct defaecation
 - Shipping/boating
 - Land use
 - Mining and waste disposal
 - Livestock farming
 - Grazing
 - Animal slaughter facilities and wastes
 - Animal slurry spreading
 - Fertilizer application
 - External medical treatments
 - Other human activities
 - Industrial waste
 - Refuse sites



Data Gathering 2 - Environment

- Wild animals/birds
- Watercourses
- Geology
- Topography
- Hydrography
 - Depth areas
 - Tides
 - Water movement
- Meteorology
 - Rainfall
 - Wind
 - Severe storms
 - Solar radiation
- Seawater salinity and temperature



Shoreline Survey

Plan and Conduct

- Safety
- Access
- Tides
- Daylight
- Weather
- Seek and record information
- Locate relevant features



Indicator/Hazard Survey

Sampling

- Determine variation in the area
- Target worst case
- Appropriate for the hazard
- Procedures in accordance with section 4.3

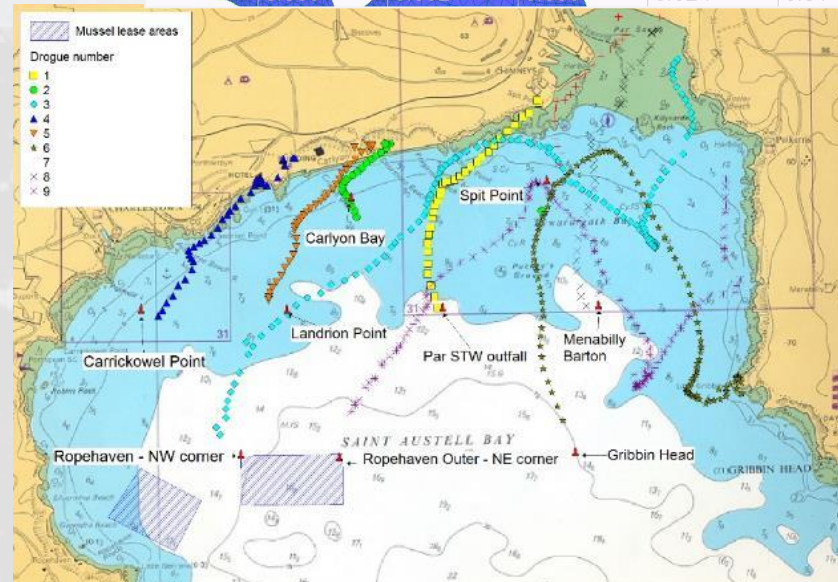
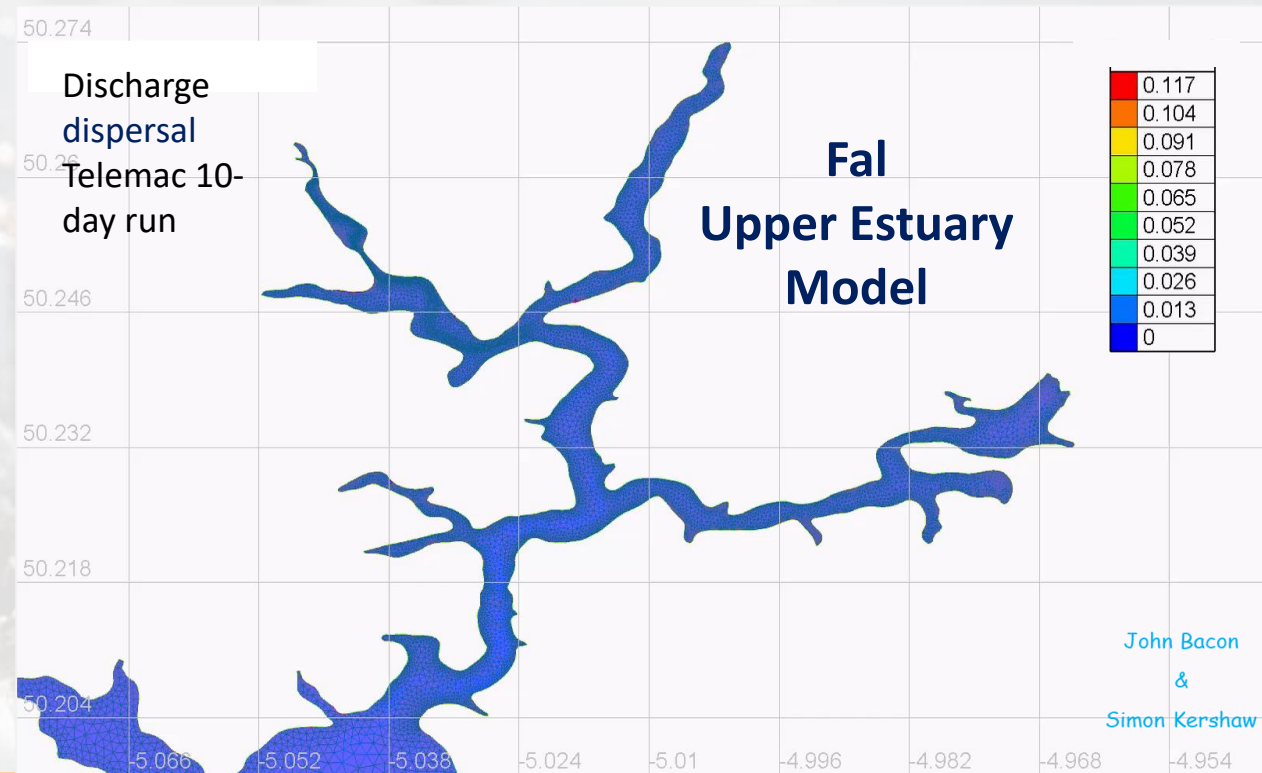
General microbiological Hazards

- Sample at least 3 times
- At least 2 weeks apart
- Where possible, at least one sample should coincide with the shoreline survey



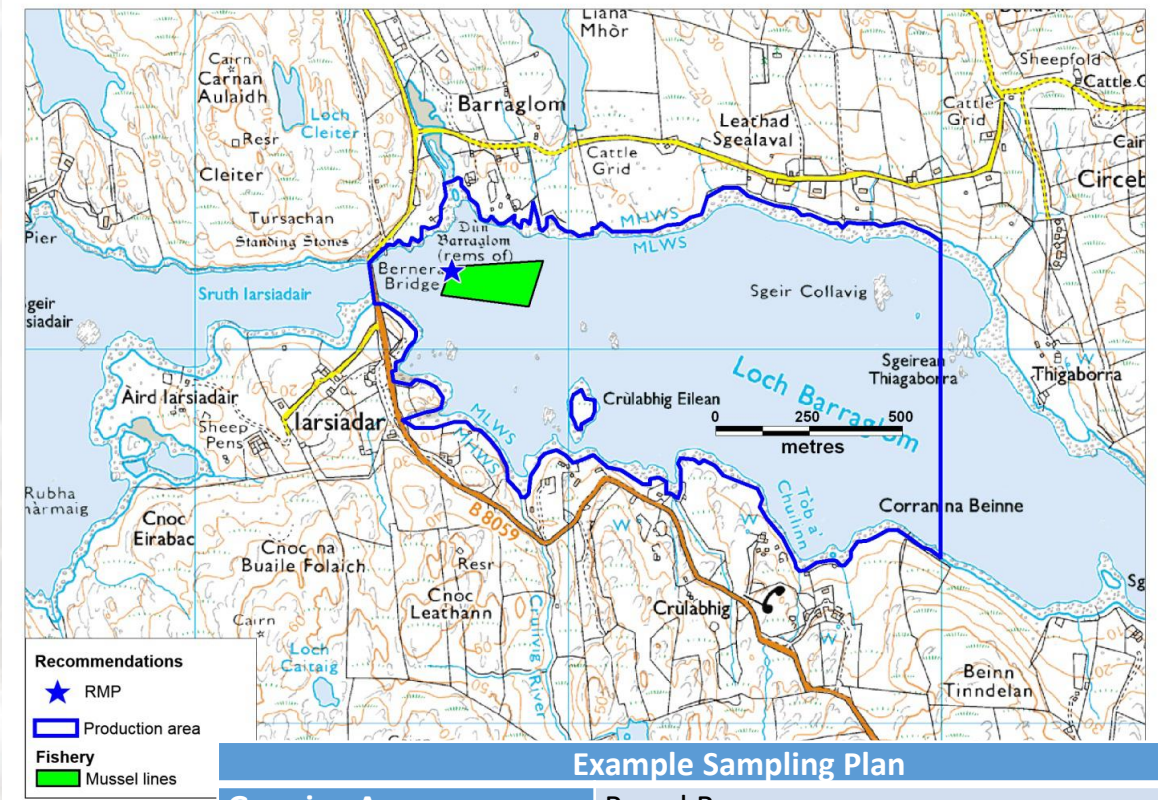
Quantitative Assessment

- Quantitative source estimation
 - At point of entry to assessment area
 - Variability in hazard content and rate of input
 - Estimate uncertainties
- Quantitative transport estimation
 - Dilution calculations
 - simple volume
 - salinity reduction
 - Tidal stream estimations
 - Tracer studies
 - Hydrodynamic modelling
- Quantitative impact estimation
 - Impact at assessment point or across the assessment area
 - Average concentration and variability of hazard or indicator
 - Take account of a range of conditions



Outcomes

- Extent of classified growing area
- Recommendations for primary monitoring
- Risk management planning
 - If conditional criteria apply
- Documentation
 - Data sources
 - Quality checks
 - Change control



Example Sampling Plan	
Growing Area	Broad Bay
Site Name	Smith Oyster Farm 1
Species	Pacific oyster (<i>C. gigas</i>)
Type of fishery	Aquaculture – intertidal racks
Method of sampling	Hand
Monitoring point	Sample Point A
Latitude	55.25819
Longitude	-4.86718
Tolerance	20 m
Depth	Not applicable
Frequency	Monthly
Authorised samplers	J. James, A. Norton
Growing area boundaries	Area bounded by a line drawn from 56.11290, -4.88736 to 54.99450, -4.85814