



Food and Agriculture
Organization of the
United Nations



Fisheries Scientific Data Collection – Minimum Requirement

Data collection - minimum data requirement for stocks
and fishery status and trend

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Data collection minimum requirements outline

- * Scientific Data definition
- * Need for standard and classifications
 - Local vs. International
 - Best practices
- * Proposal for WECAFC scientific data minimum requirements

What are scientific data?

- * Fisheries Scientific data: no official data definition exists.
- ✓ Includes all data needed to provide scientific recommendations on fisheries management/exploitation to policy makers.
- ✓ Including relevant statistics to do stock assessment.

Eg. of scientific data?

- * Fisheries Scientific data type definition examples
- * **EU – Data Collection Framework** (DCF – see JRC <https://datacollection.jrc.ec.europa.eu/>)
 - * Transversal data: capacity, effort and landings
 - * Biological data: length distribution
 - * Economic data: Fleet economic data (earnings and costs)
- * **NOAA**
(http://www.nmfs.noaa.gov/stories/2012/05/05_23_12stock_assessment_101_part1.html)
 - * Catch Data
 - * Abundance Data
 - * Biology Data

Scientific Data: Agreed definition

- * Fisheries Scientific data agreed definition
 - * **Exploitation data:**
 - * Capacity: the total fleet by type of fishing unit
 - * Effort : number of days / hours fished by fishing unit
 - * Landings: quantity of landed fish by fishing unit
 - * Abundance Data (CPUE)
- ➔ Provide level of stock exploitation (fish removed from the stock by human activities)

Scientific Data: Agreed definition

- * Fisheries Scientific data agreed definition

- * **Biological data:**

- * Length and age distribution: number of fish caught by size and age
 - * Biology data: stock structure and composition, growth rate, natural mortality rate, predation mortality rate
 - * By catch / discard: quantity of non targeted fished and discarded fish (and its mortality)

- ❖ Stock status indicators

- * MSY: Maximum sustainable yield
 - * MEY: Maximum Economic Yield

- ➔ **Feed stock assessment computation**

We acknowledge the importance of economic data but we will be focusing on exploitation and biological data.

Scientific data collection: Source

- * **Exploitation data:** comes from catches, effort, landings:
 - * by National fisheries monitoring systems
 - * (logbook/e-logbook, sample based survey, frame survey, landing survey)
- * **Biological data:** observers on board, scientific fishery campaign, scientific research on fish biology
 - * By national / regional / international research institutes
 - * Data from various different sources

Norms and standards

- * Importance of norms and Standards.
- * What are reference data (norms and standards)?
 - * Harmonized concepts and definitions
 - * List of classifications for indicator dimensions such as species, areas, fishing unit, gear/vessel type etc....
 - * Can have a national, regional or international scope
- * Use/Application of reference data
 - Allows for comparison across time and between countries

Norms and standards Requirements

- * Importance of mapping national standard reference data to international classification
 - * Crucial for data and information harmonization at regional level (for shared stocks)
 - * Important for FIRMS/FAO reporting
- * Develop regional classification for main standards (Species Vessels etc..)

WECAFC norms and standards requirement

- * Reference data
 - * Species – Name of spp.
 - * Vessel type- categories and size
 - * Gear type – name and description
 - * Stocks – species name and geographical area
 - * Fishing zones – high seas, EEZ, Territorial sea, grid maps – eg, 1Mx1M , 2.5 M x 2.5M

WECAFC data requirement

- * Indicators :

- * **Exploitation data**

- * Capacity: the total fleet by type of fishing unit
 - * Effort : number of days / hours fished by fishing unit
 - * Landings: quantity of landed fish by fishing unit and species
 - * Abundance Data (CPUE)

- * **Biological data**

- * Length and age distribution: number of fish caught by size and age

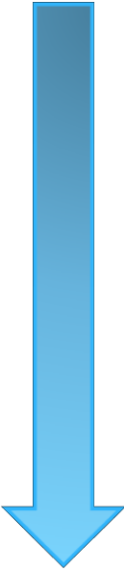
Limited Human and Financial Resource Approaches

- * Sampling approach: minimize the cost of fisheries monitoring but need for at least one statistician (not always part of the institution staff)
- * Weight of Evidence approach

An approach for determining stock status in the absence of complete assessments (from Department of Agriculture, Australia)

- * Many uncertain stocks do not have a reliable stock assessment for deriving status
- * However, in many cases there are indicators and information to make a reasoned assessment of likely status
- * We needed a process for making stock status determinations, in the absence of more complete assessments (data poor stocks and fisheries).
- * Transparent (documented) and repeatable process
- * Formalise the process and re-examine many of the ‘uncertain stocks’

The weight of evidence approach

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1. Describe the attributes of the species and fishery
 2. Compile lines of evidence for status
 3. Status Determination (weighing the evidence)
 - **Overfished** Not overfished
 - **Overfishing** Not overfishing

1. Describe the species and fishery

May influence the interpretation of the indicators, or suggest the level of precaution (risk) in status determination.

Species

- Management unit: Species/‘basket group’
- Productivity:
 - life span
 - maturity
 - Fecundity
 - trophic level
- Estimate of Natural mortality
- Aggregation
- Mobility
- Stock structure: in comparison to management unit

Fishery

- Target species, byproduct, bycatch
- Number of fisheries/sectors (other sources of F)

2. Lines of evidence

Potential indicators of B or F . Critically review each line of evidence (responsive to change, impacts of other drivers, potential bias)

A. Empirical indicators (e.g)

- * Catch / effort
- * Size (or age) mean/frequency
- * Effort trend & recent effort
- * CPUE (standardised) trend
- * Spatial distribution of catch/effort over time
- * Proportion of the species distribution fished

B. Risk assessments

- * PSA (relative risk); SAFE (absolute risk)

C. Fishery independent surveys

- * Trends in estimated biomass; estimates of recent biomass
- * Compared with reference points

2. Lines of evidence (continued)

D. Modelling/assessment results

- * CPUE trend analysis
- * Fishery – dependent depletion analysis
- * Catch curve analysis
- * Non-equilibrium surplus production model
- * Delay-difference model
- * Integrated stock assessment model
- * Outputs compared with reference points

E. Harvest strategies

- * Reference points (target and limit); performance measures; harvest control rules
- * MSE testing may demonstrate effectiveness of the harvest strategy
- * Compliance with harvest strategy

3. Status determination

A. Weighing the evidence

- * An integrated stock assessment model
- * Fishery independent survey
- * A robust form of assessment, with appropriate reference points
- * A robust catch curve (F status)
- * A robust CPUE analysis (B status)

B. Expert input/review

- * Status determination workshop
- * External review

C. Reasoning and documentation

- * Key indicators/evidence used
- * Interpretation of weight of evidence, implications for status
- * Conclusion on status
- * Inconsistent indicators (if any)
- * Key information gaps

Australian experience

- * Expanded our ability to provide advice on status (and therefore advice for management)
- * We often knew more than we thought
- * **Most effective for resolving status for species with light-moderate history of fishing pressure (F)**
- * A structure for utilising multiple lines of evidence rather than needing to rely on the outputs of a single stock assessment (or single assessment sensitivity)
- * It's not new ... It's not rocket science

Thank You!
Merci!