



FishStat

FAO FISHERY AND AQUACULTURE STATISTICS

2. Data collection and sampling

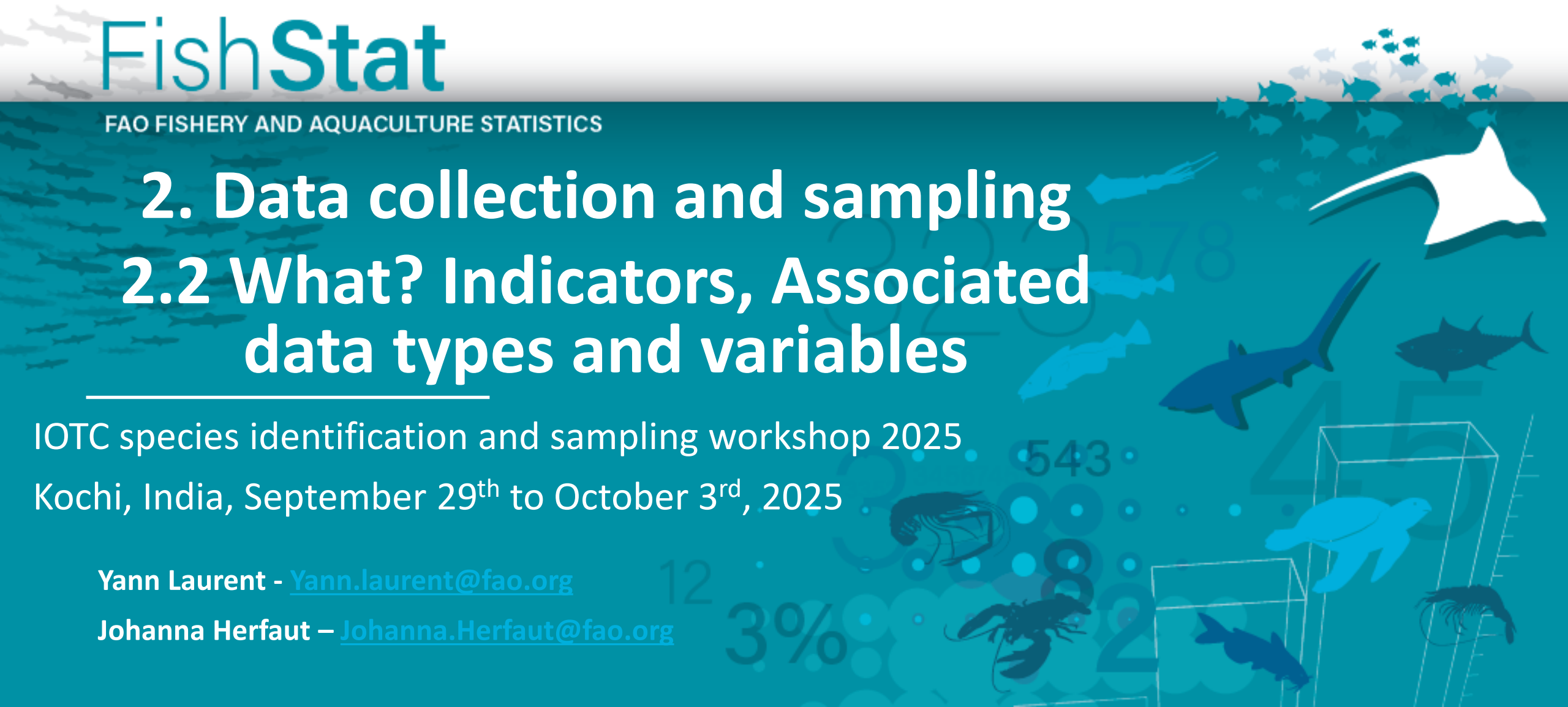
2.2 What? Indicators, Associated data types and variables

IOTC species identification and sampling workshop 2025

Kochi, India, September 29th to October 3rd, 2025

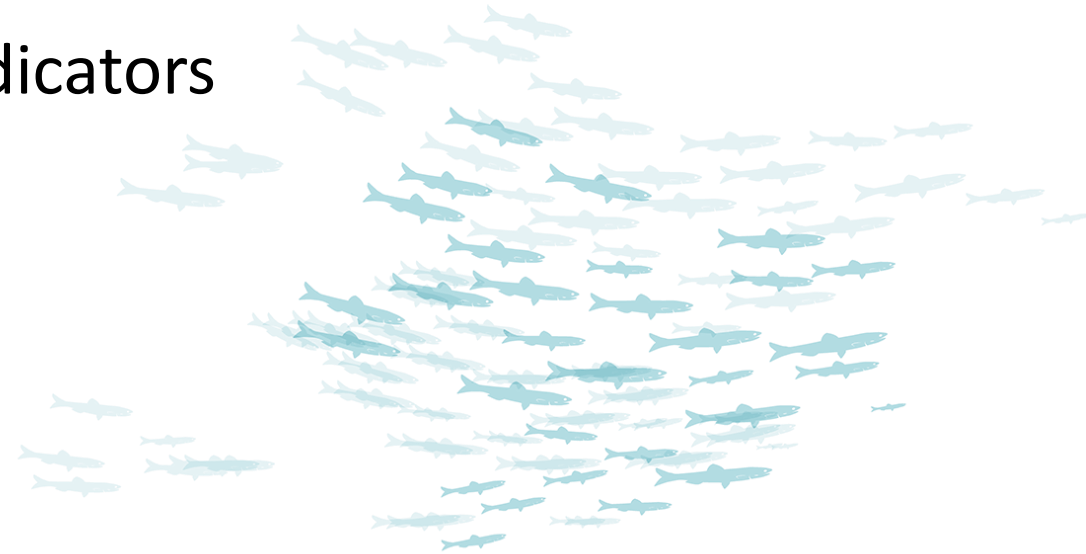
Yann Laurent - Yann.laurent@fao.org

Johanna Herfaut – Johanna.Herfaut@fao.org



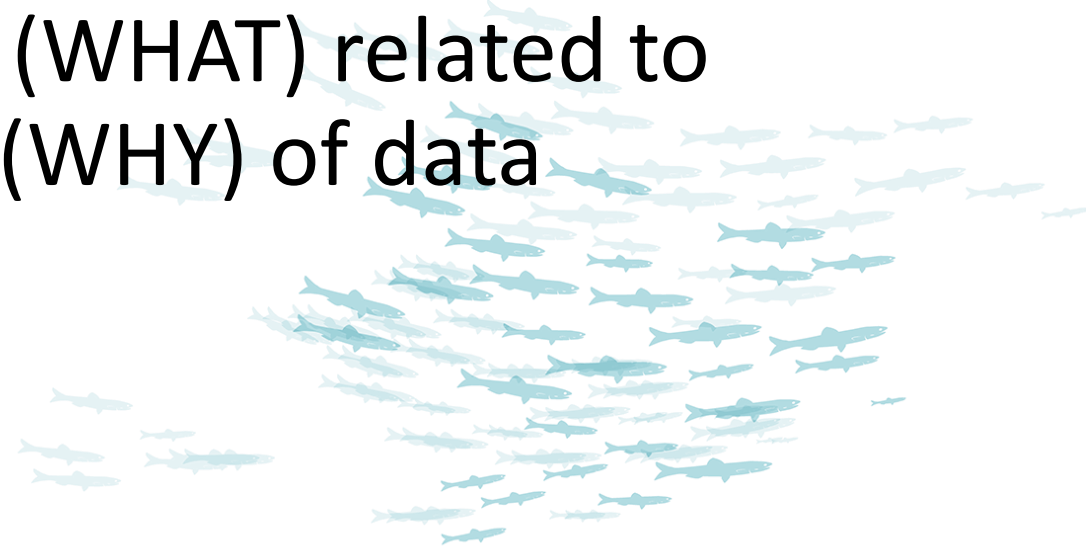
Outline

- Objectives of the module
- Variables and indicators?
- Identity Variables and indicators
- Long time series needed
- Exercise



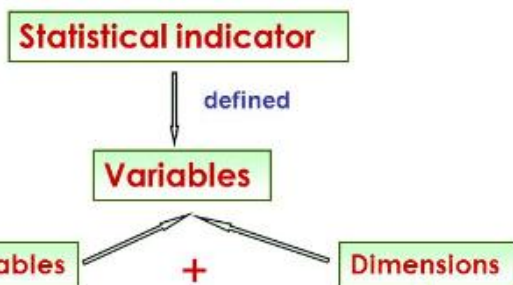
Objectives of the module

- To provide an overview of the major indicators and variables (WHAT) related to the different objectives (WHY) of data collection



INTRODUCTION

- Once policy and management objectives are defined with their relative reference points, appropriate performance indicators can be identified, and so can be the variables which are needed for their estimation.
- However, there is feedback between choice of indicator and data variables, since it is at this stage that logistics and costs have a significant influence on the data collection programme.



VARIABLE AND INDICATOR?



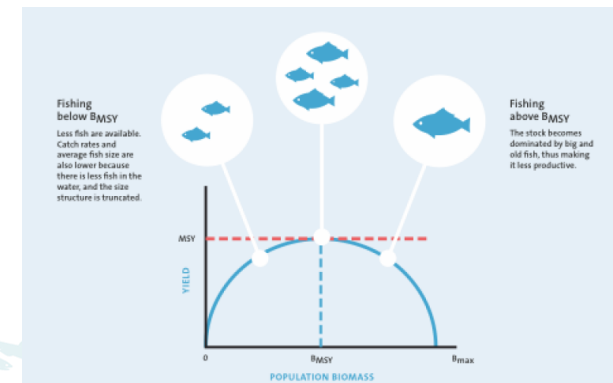
- Variable = What is collected in the field
- Indicator = What is used to measure effectiveness of fishery management policy actions implemented



In some cases a variable is also an indicator

EXAMPLES OF INDICATORS

- **Biological indicators** can be used to monitor the state of exploitation of the fishery, but are inadequate to assess the performance of the fisheries sector as a whole. E.g. stock size, stock structure, community structure, environment
- **Economic indicators** can measure the relative importance of the fishery to the nation or region at the macro- or micro-economic level.

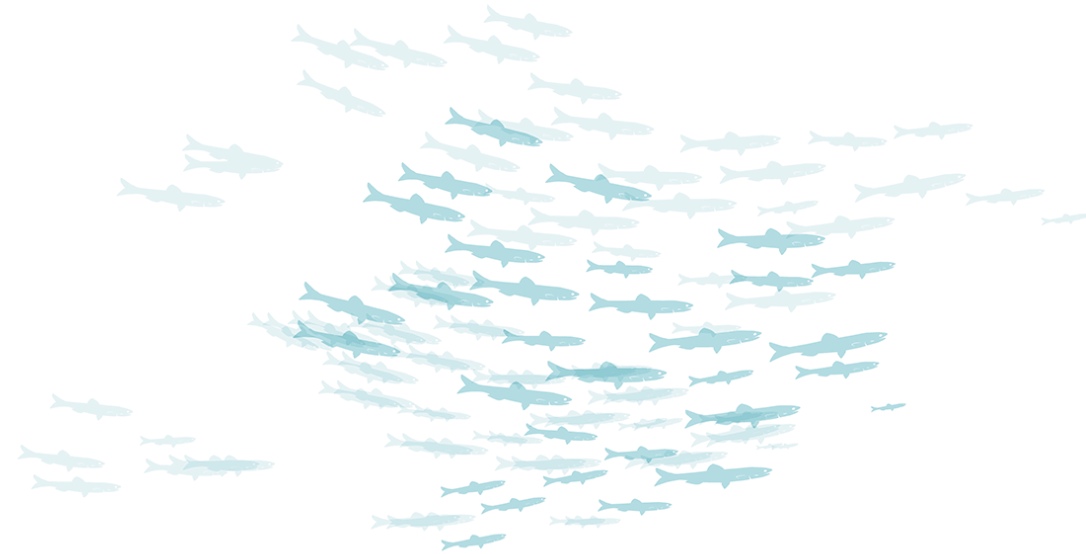


OTHER EXAMPLES OF INDICATORS

- CPUE and Fishing Effort (also are variables)
- Fishing indicators e.g. catch, effort
- Fishing operations indicators e.g. number by types of gears and vessels
- Compliance indicators e.g. changes in number of by types of offences
- Socio-cultural indicators e.g. demographics (household no, etc), distribution of income and consumption, nature of access to the fishery

Examples of economic indicators

- Market prices
- Gross value of the product (GVP)
- Costs and earnings/profitability
- Investments
- Subsidies



WHAT INFLUENCES CHOICE OF VARIABLES?

- Financial and human capacity of the line agency responsible for data collection.;
- The operational characteristics of the fishery which dictates what can feasibly be collected;
- The total number of variables which can realistically be collected;
- The number of indicators which a variable can be used for;
- How often the data needs to be collected; (or the variable needs to be sampled);
- The expected data quality and quantity that can be obtained.

NEED TO IDENTIFY APPROPRIATE VARIABLES

- Any designer of a data collection programme should identify
 - (a) the appropriate variables that are both feasible to collect, and
 - (b) variables that can provide the relevant indicators for management and policy development.

NEED TO COMBINE INDICATORS TO GUIDE MGT DECISION

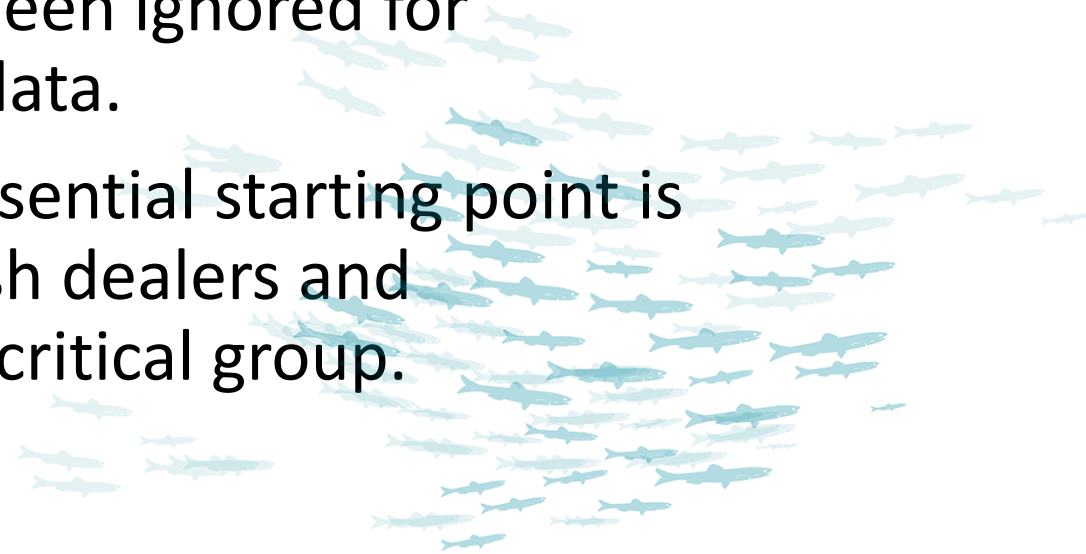
- Socio-cultural indicators take into account the diversity of needs and practices of different groups of people within the fisheries sector.
- Compliance indicators are needed to monitor the effectiveness of management measures and reduce conflict.
- In practice, fisheries assessments should always combine biological, economic, socio-cultural and compliance indicators to guide management decisions.

Why?

- The identification of policy priorities and management issues are largely dependent on the identification of problems in the fishery.
- A number of performance indicators exist which can help to identify these problems, suggest courses of action and monitor the results.

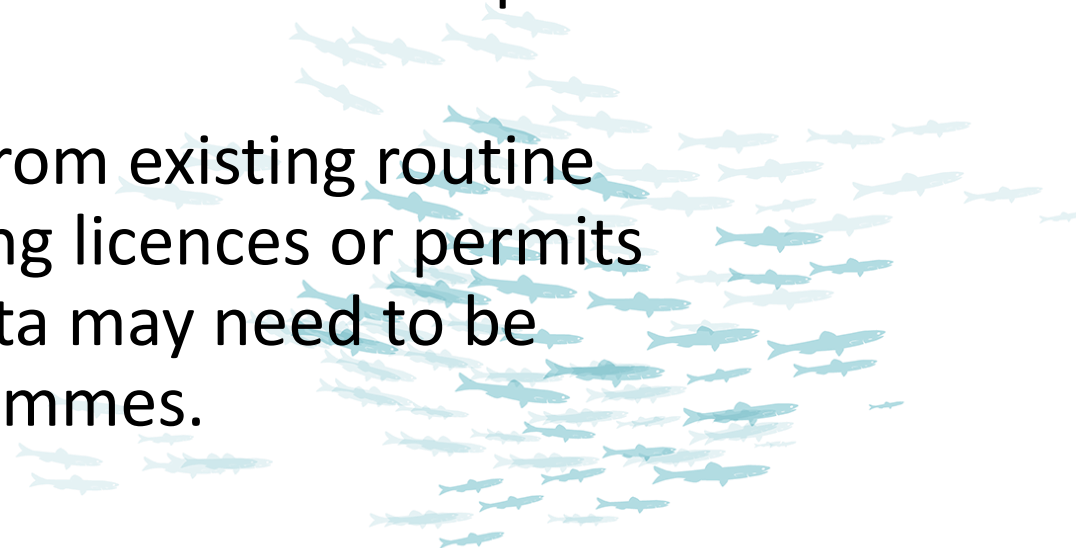
LONG TIME SERIES OF DATA NEEDED

- In many cases, it is imperative to have **long time series of data collected consistently and routinely** in order to evaluate **trends** in the behaviour of a variable. This has long been accepted practice with fisheries data, but has often been ignored for economic and socio-cultural data.
- For socio-cultural data, the essential starting point is data on individuals fishing. Fish dealers and processors are the next most critical group.



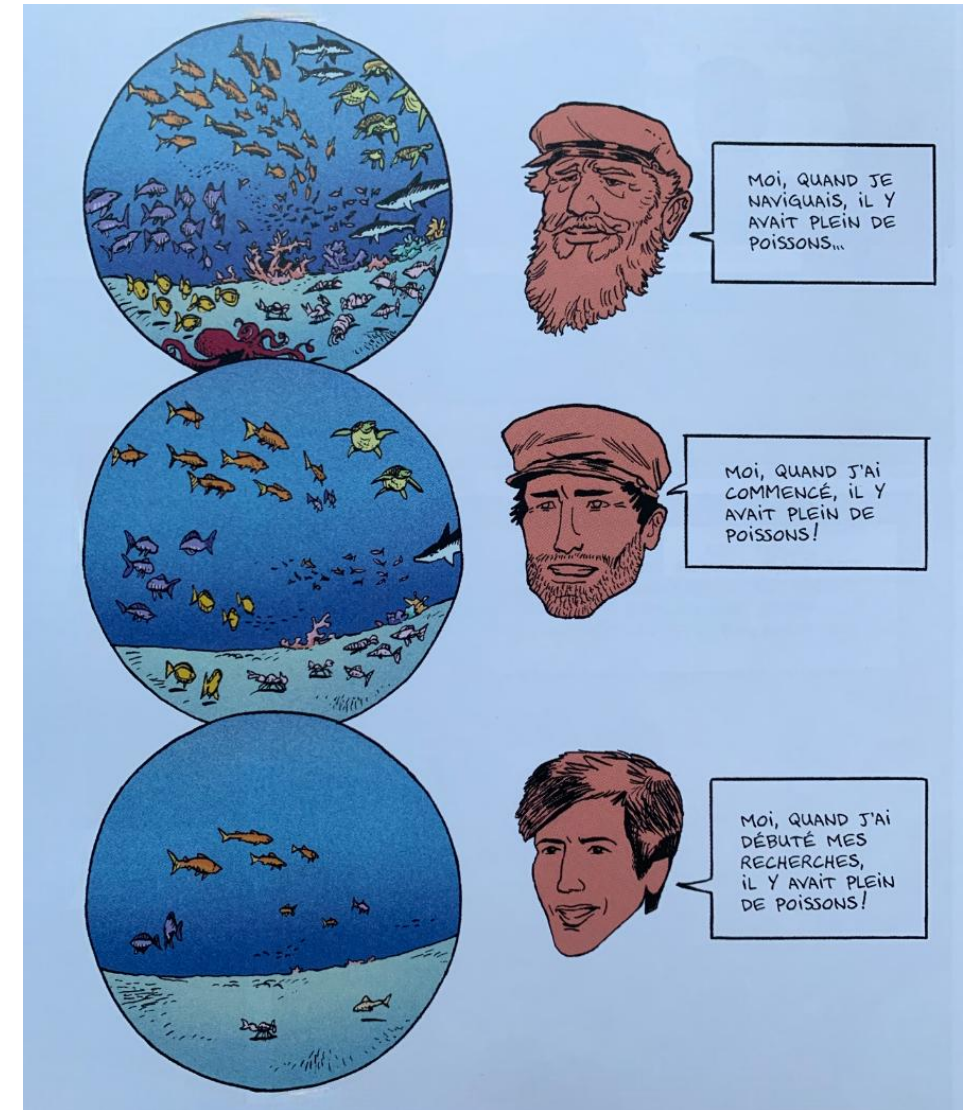
LONG TIME SERIES OF DATA NEEDED (CONT.)

- Data collection on other interested parties (such as consumers, environmental organizations, coastal developers, etc.) can be added as funding becomes available. However, the level of detail both required and available will vary.
- Some data may be acquired from existing routine data collections, such as fishing licences or permits and census records. Other data may need to be collected through new programmes.



LONG TIME SERIES OF DATA NEEDED (CONT.)

- Longtime series are the only remedy to shifting baseline syndrome

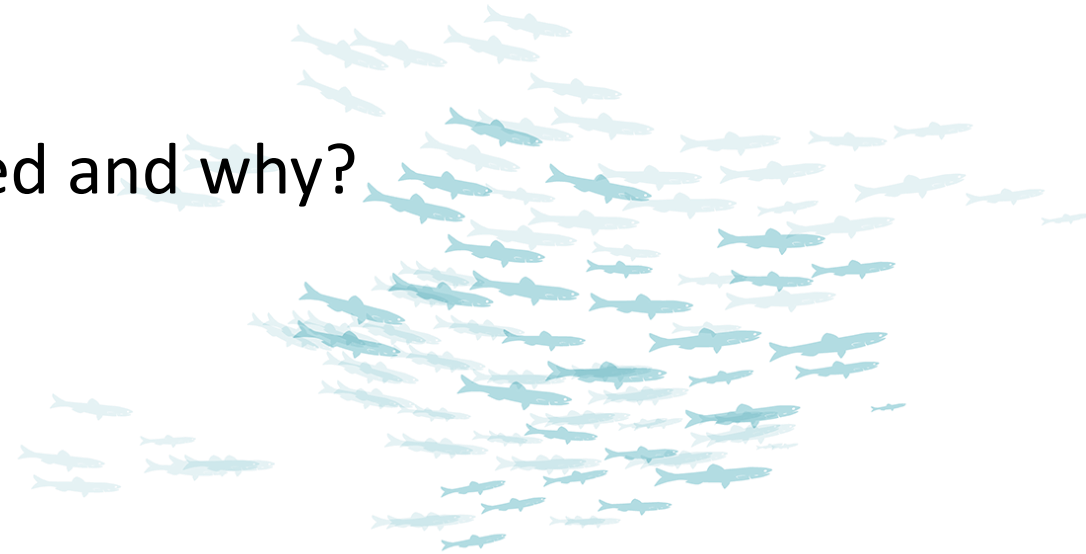


A VARIABLE CAN SERVE MORE THAN ONE INDICATOR

- Many of the variables can be used for more than one type of indicator (e.g. catch and effort). This contributes to determining their importance and priority in data collection.
- In some cases, important data types are used in a number of different assessments as they measure a commonly used factor.
- For instance, catch is both a measure of the benefit to society and "cost" to the resource, and hence occurs in both economic and biological indicators.

Practice

- Regarding to your objectives and needs, list the major indicators and associated variables that need to be gathered from the fisheries in your country.
- Are these being collected?
- If YES what are the problems encountered and why?





Food and Agriculture
Organization of the
United Nations

Thank you ▪ Merci
Благодарю ▪ ¡Muchas gracias!
謝謝 ▪ شكرا

Yann Laurent

✉ yann.laurent@fao.org

