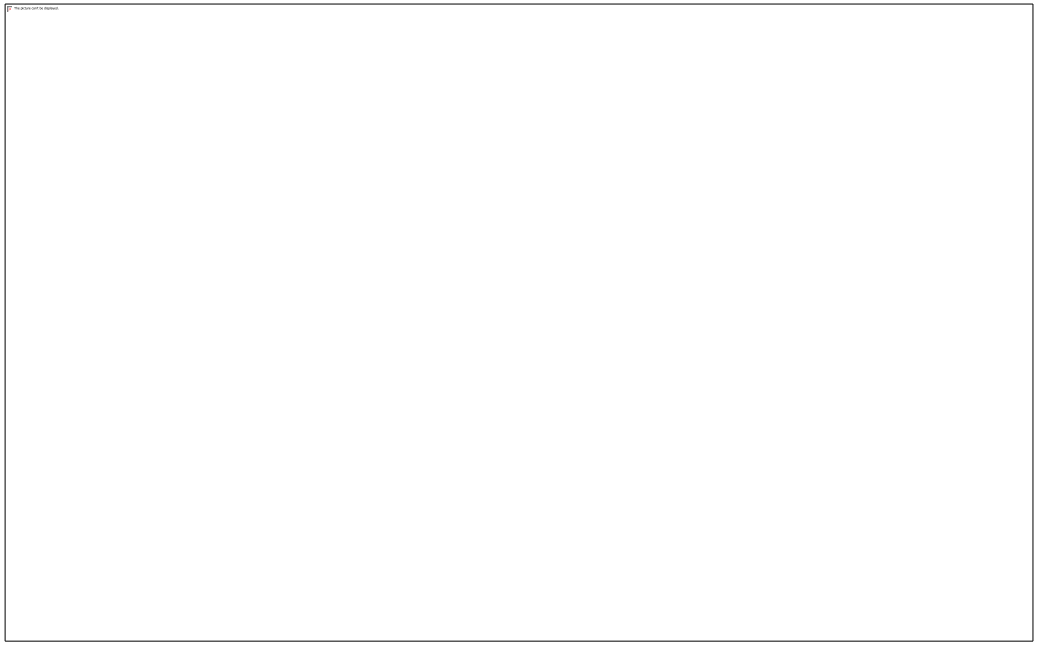
Framework for Fisheries Research Data



UN/CEFACT

27th Forum

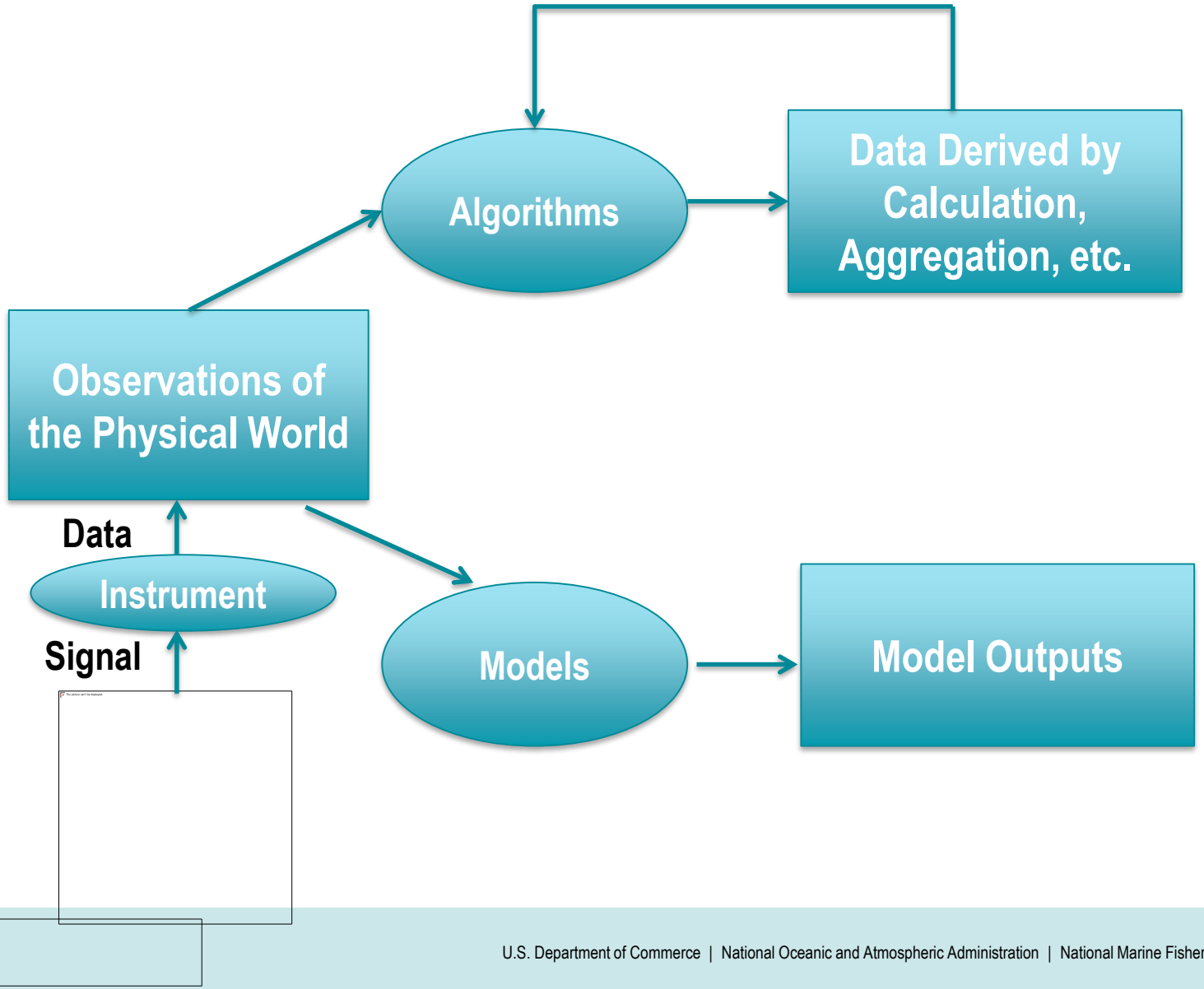
Presented by M. Brady

April 27, 2016

Given the great variety of research data, is it possible to represent it all in a single framework?

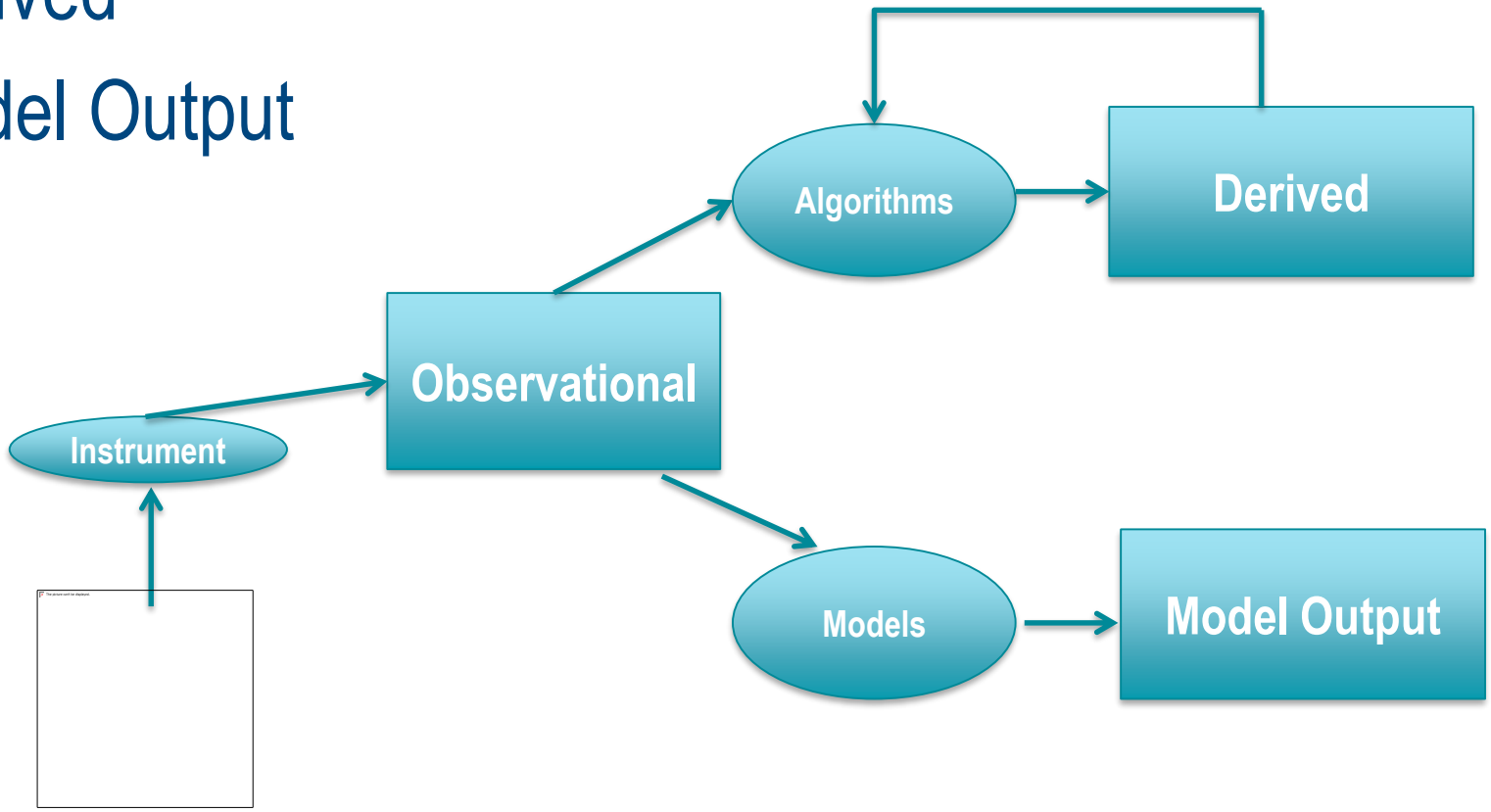
- Yes
- All fisheries research data is derived from observations of the physical world.
- Further datasets are derived from those observations.

Origins of research data



Three Data Origins

- Observational
- Derived
- Model Output



Attributes of research metadata answer these questions:

- Origin?
- If Origin = Observed then
  - What was observed?
  - How?
- In all Origin cases
  - When?
  - Where?
  - Why?

What was observed?

- Is it purely taxonomic?
- No

What was observed?

- Taxon
- Species complex (e.g. *skates of commercial interest*)
- Species found in the same habitat (e.g. *groundfish*)
- Species using a particular form of locomotion (e.g. *plankton, nekton*)
- Species sharing a migration pattern (e.g. *anadromous, catadromous*)
- By trophic level (e.g. autotroph, prey, predator, etc.)
- Habitat or Environment

What was observed? (non-living)

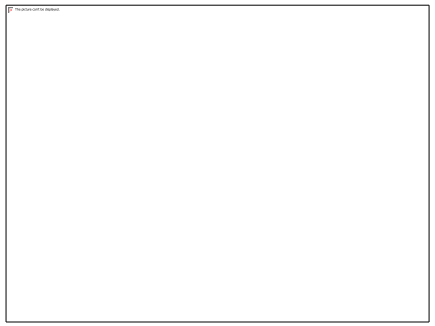
- Air
- Other gases
- Water
- Oil
- Other pollutants
- Sea floor materials
- Equipment

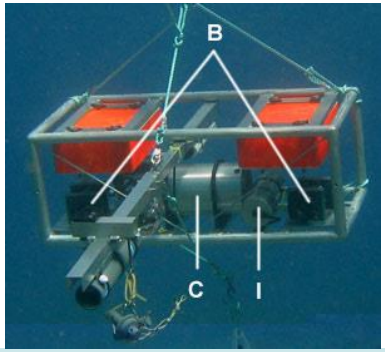
What was observed?

- Humans (such as fishing activity, trade, socio-economic)

How?

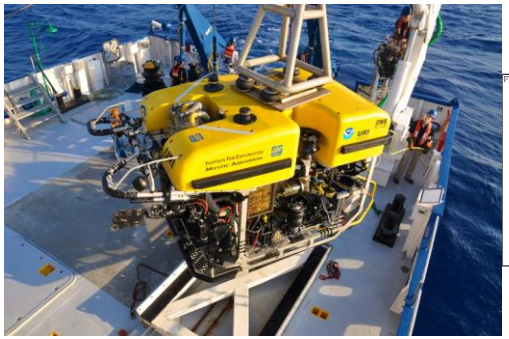
- Platform (NOAA ships, aircraft, buoys, gliders, satellites by model number)
- Physical collection gear (such as fishing gear by type)
- Instrument (such as camera, thermometer, sonar, pressure gauge, by model number)





Platforms

- Definition: The thing an instrument or other platform is mounted or transported on.
- Can be an animal.
- It is possible to generate various levels of description from the specific, but not the reverse.
- Avoid mixing levels of description.



Physical Collection Gear

- Definition: things that collect physical specimens. No data is created.
- Fishing gear by category
- Gas, water, and bottom samplers by model number.

Instruments

- Definition: device that converts a physical signal into data. Data is symbolic.
- Data formats, such as acoustic recordings, image data, etc., can be deduced.
- By model number where possible.
- Includes human observer.

Why?

- Legislative reason
- Scientific topic

Legislative – U.S. Examples

- Magnuson Stevens
- Marine Mammal Protective Act
- Endangered Species Act

Scientific Topics

- List based on a sample of 1300 NOAA datasets
  - Aquaculture & Hatcheries
  - Population, Distribution, & Biomass
  - Growth
  - Maturity
  - Reproduction
  - Life History
  - Life Span
  - Pathology & Disease
  - Mortality
  - Stock Definition & Differentiation
  - Habitat & Ecosystem
  - Movements & Migration
  - Systematics
  - Morphology
  - Physiology
  - Diet & Predation
  - Biochemistry
  - Oceanography
  - Weather & Climate
  - Genetics
  - Toxins, Pollution & Debris
  - Other Chemistry
  - Socio-Economics

From topic comes data attributes

- Population example
  - Species
  - Location
  - Date – time
  - Abundance
    - Count
    - Weight
  - Sexual characteristics
  - Lengths
  - Age
  - How? Covered in metadata

From topic comes data attributes

- Migration example
  - Species
  - Space-time path

End