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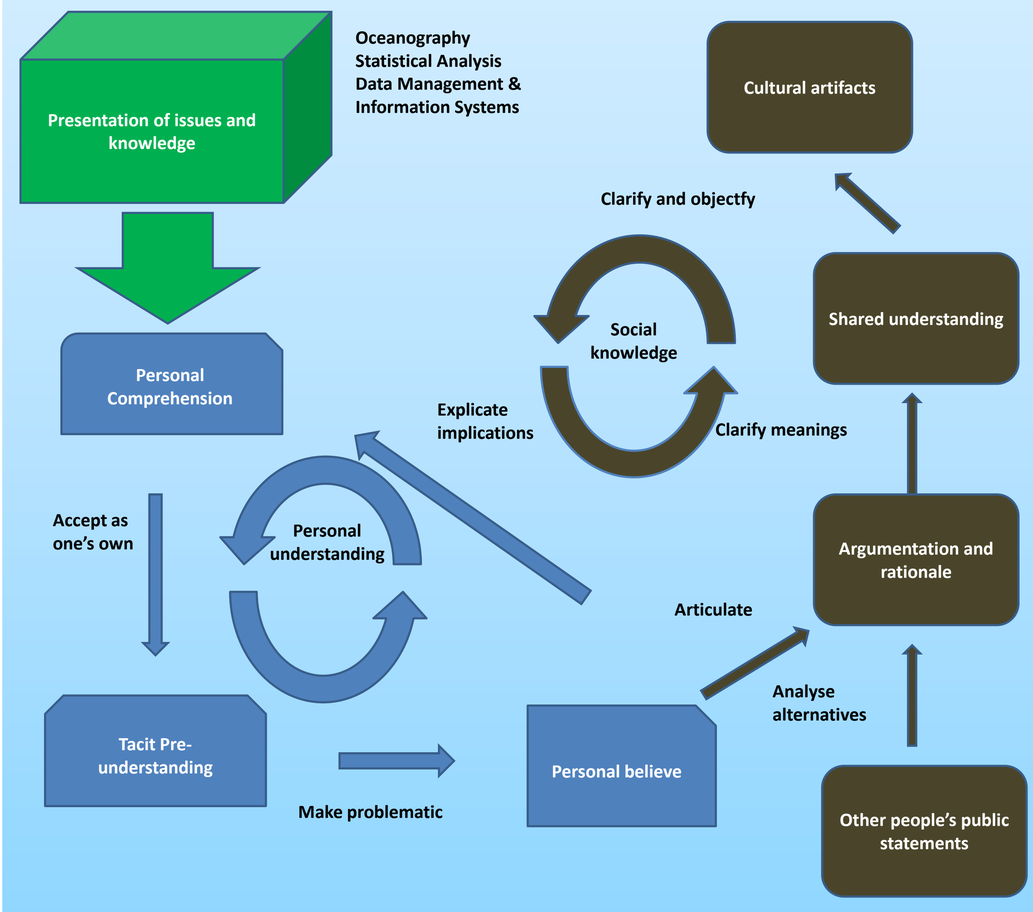
Collaborative Knowledge – Building

OTTIMA (Operational oceanography and Technologies for Maritime Security) is a training course that aims to prepare and deliver a training program that allows students to gain mastery of methodological and operational aspects of the basic sciences, operational oceanography, technology and engineering as applied to the oceans and the seas.

Science and society

Scientific and technological developments must be included in the continuous improvement of human knowledge, to increase the well-being of all societies. Four commitments have been identified as important if discourse is to create advances in knowledge (Bereiter 1994):

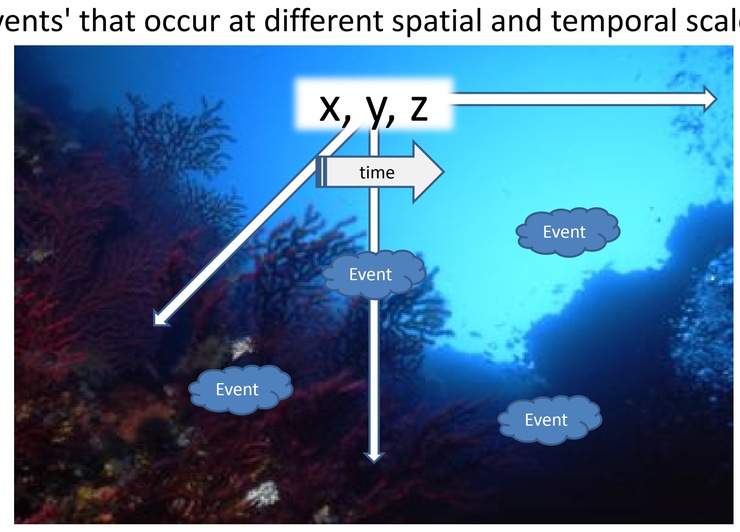


1) Mutual advances in understanding. This is a commitment to work toward advances in understanding that are satisfactory to all the participants to a debate.
2) Empirical testability. Honoring the empirical testability commitment means voluntarily making any position vulnerable.
3) Expanding the basis for discussion. A commitment to expanding the basis for discussion is a commitment to expand the network of facts and ideas that participants already accept or that they will at any rate not deny (Miller,1987).
4) Openness. Although a group may have achieved agreement that Theory Y is a great improvement over Theory X, some other group may disagree. It is necessary try to achieve a new mutual understanding -Theory Z, perhaps which both groups will recognize as an advance.

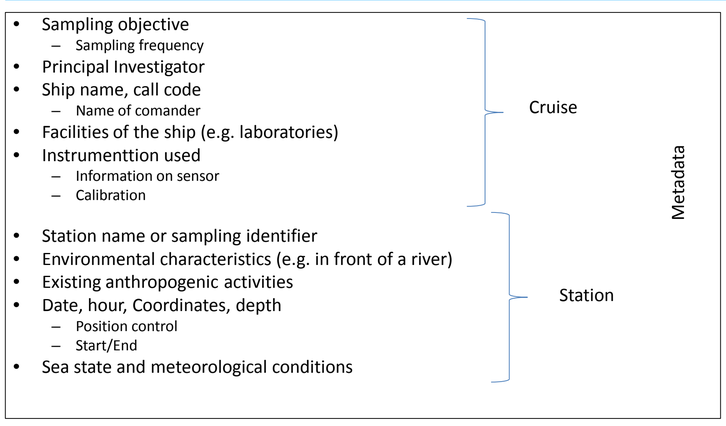
An important requirement for constructing group knowledge is the establishment of shared understanding. In OTTIMA this was done by clarifying the meaning of important terms used in various competing claims. The communication methodology and technology are considered as very important tools.

Marine data management: the OTTIMA model

We are coming from different university experiences and scientific background (physics, biology, geology). The common understanding was that in the ocean there are 'events' that occur at different spatial and temporal scales.



Events in the marine environment. Event is defined as a spatial - temporal change.



Depth	Date, hour, position	Activity/parameter	Error	QC	Cruise name	Names and operators' number

Quality Assurance

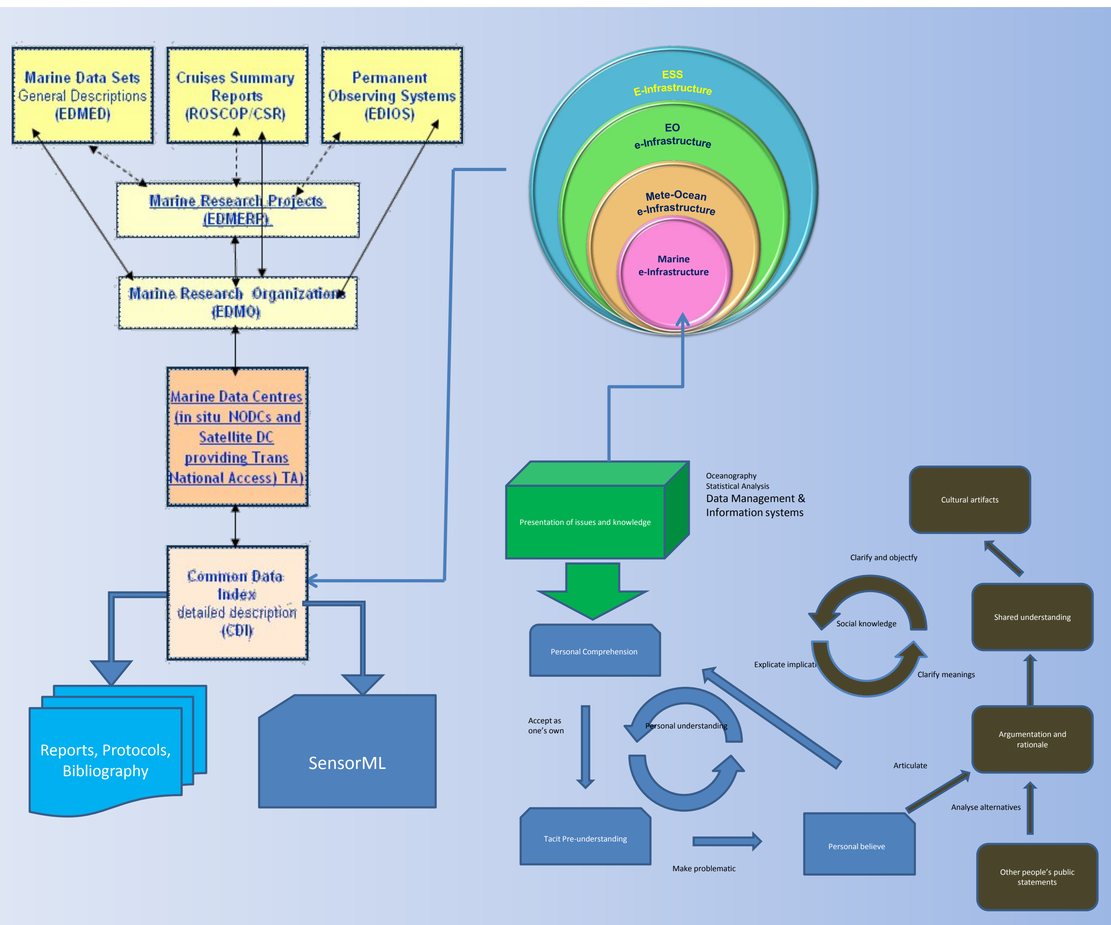
The quality assurance is a generic concept able to include the different practices needed to be applied to the different disciplines. It must include the preparation of different devices (mechanical, electronic, plastic boxes, etc.) that must ensure the collection of uncontaminated/undisturbed samples. This concept has strong implications in the design of instrumentation and probes (e.g. CTD, XBT, ...), and on the materials to be used. The instrumentation/tools must perfectly fit the purposes of the data collection. The following issues have been discussed in OTTIMA: 1) some sampling systems cannot assure 'a priori' the quality of data; 2) it is of importance to train the personnel dedicated to data collection; 3) a record of what is happening during the data collection is of paramount importance; 4) ex-situ analysis should be done with a short time delay and in 'controlled' laboratories.
We have provided different ideas on what should be the data model to be adopted for data exchange. Each idea contributed to the definition of what have been called 'OTTIMA model'. The model is including a principal header giving general information on the cruise, followed by information on station.

Knowledge management

Knowledge building is a first step for the wider objective of participation to societal advances in science, technology and sustainable development. In OTTIMA it has been proposed a knowledge management system that is based on two main components:
1) knowledge building environment - a continuous learning practice that allows the presentation of theories, the comparison with observations, understanding and resolution of controversies
2) information system - an open and free access to data/products and information related to the data acquisition (including environmental conditions), instrumentation, protocols for in situ and ex situ practices used for quality assessment and quality control.

The second component of the knowledge management systems has been identified in the European infrastructure SeaDataNet. The data and tools provided through this portal are judged appropriate for being the second pillar of the knowledge management system. However, it has been recognised that two elements are still in SeaDataNet:
•the access to papers, books, documents, etc.
•the access to information on how each instrument was working during the data collection

The knowledge management model proposed in OTTIMA is represented in figure, where the knowledge building element is strongly linked to the information system (SeaDataNet infrastructure), that is providing access to data and products, and must include also links to bibliography and instruments.



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