

ATKINS

St Lucia Coastal Habitat Mapping Project

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DATA COLLECTION FOR HABITAT MAPPING

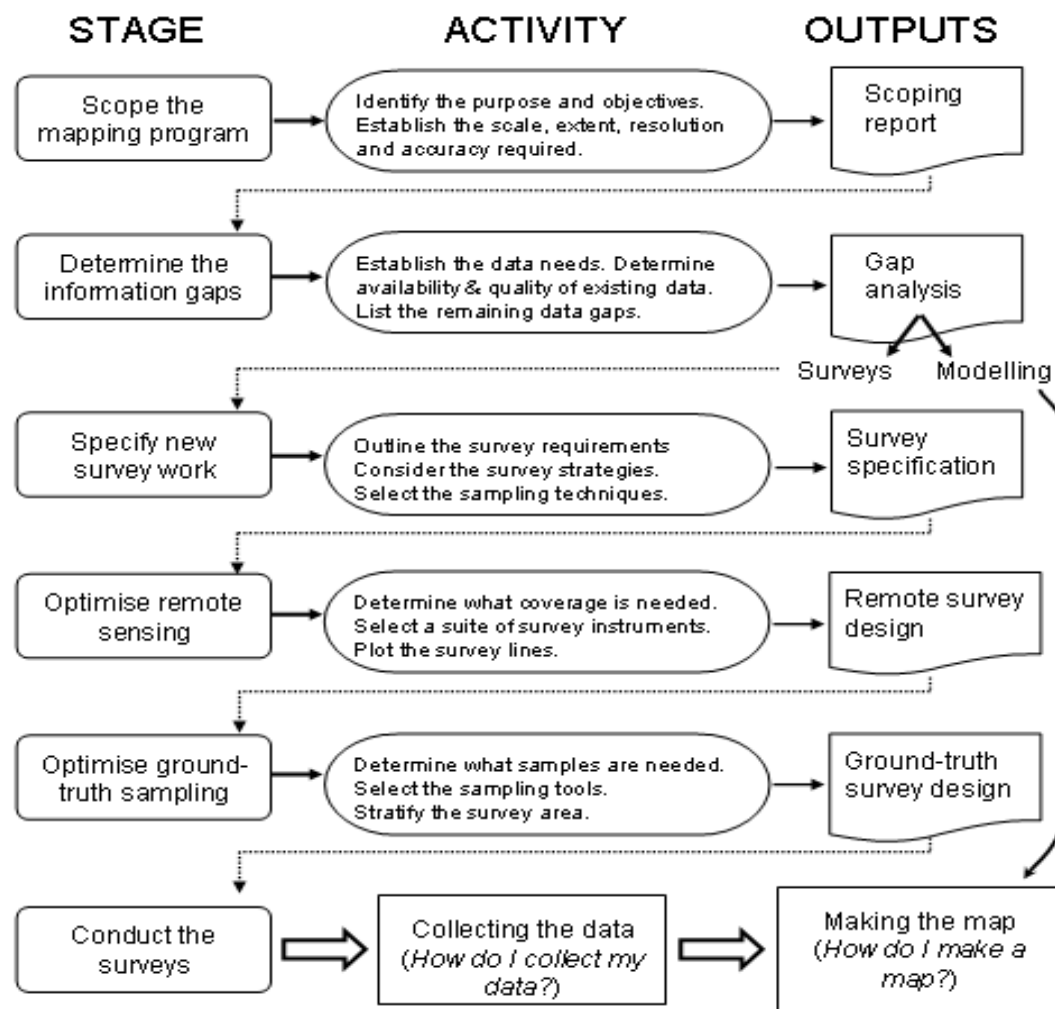


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Session Purpose

- Provide an understanding of the planning stages of a mapping programme
- Provide an overview data collection techniques and processes

Stages of a Mapping Programme

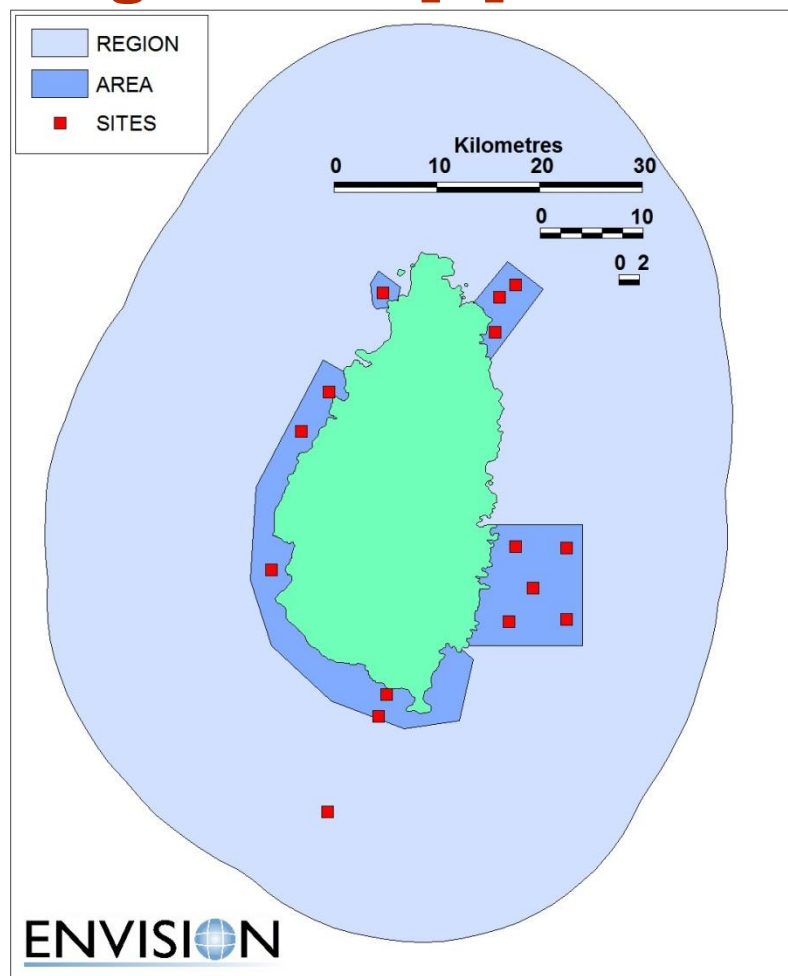


Scoping the Mapping Programme [1]

- The scoping process can be broken down into two phases.
 - **Phase One: Consultation**
 - Stakeholders & end user are engaged in understanding the feasibility of project (budget vs. desired products)
 - **Phase Two: Consideration**
 - This stage involves consideration of the scope of work and detailing of the technical elements of a mapping project. These may include: technical elements of mappings (i.e. work packages), scale (broad or fine scale), extent, resolution and accuracy

Scoping the Mapping Programme [2]

- Environment affects the suitability of various survey tools and techniques, the nature of the area to be mapped must be also considered.
 - Site,
 - Area
 - National and
 - Region wide



Determine Information Gaps

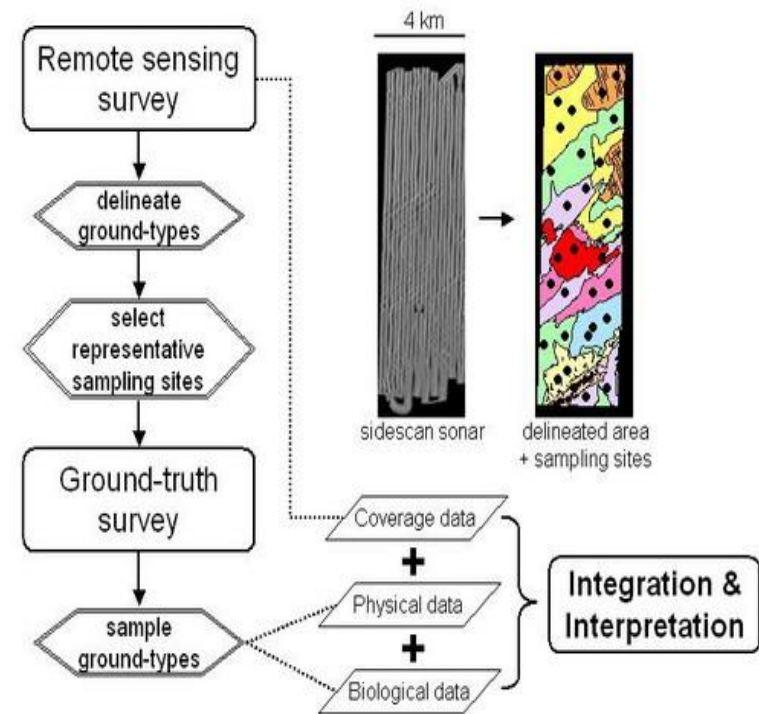
- Consideration must be given to the types of information the maps need to convey as well as data that are needed develop the maps. A data gap analysis is performed to determine:
 - First stage: ‘What types of data are needed?’.
 - Second stage: Search for existing data -> data availability; data quality and data coverage.
 - Final stage: Develop a report capturing the essential information

Determine Information Gaps

Data Types	Required	Available	Is the data of suitable		Are new data needed?	
			Quality?	Coverage?	From survey	From model
<i>Elevation</i>						
Topography (heights)	No					
Bathymetry (depths)	Yes	Part	OK	No	Part	
Slope	Yes	No				Yes
<i>Geological</i>						
Lithology	Yes	All	OK	Yes		
Sediment thickness	No					
Sediment/substrate types	Yes	Part	OK	No	Part	
Bedforms	Yes	Part			Part	Part
Granulometry (PSA)	Yes	No			Yes	
Geotechnical properties	No					
<i>Physical/Oceanographic</i>						
Temperature	No					
Light penetration	No					
Wave exposure	No					
Salinity	Yes	Model	OK	OK		
Wave base	Yes	Model	OK	OK		
Tides/currents	Yes	Model	OK	OK		
Seabed shear stress	Yes	Model	OK	No	Yes	Yes
Turbidity	Yes	Model	OK	OK		

Define Survey Requirements

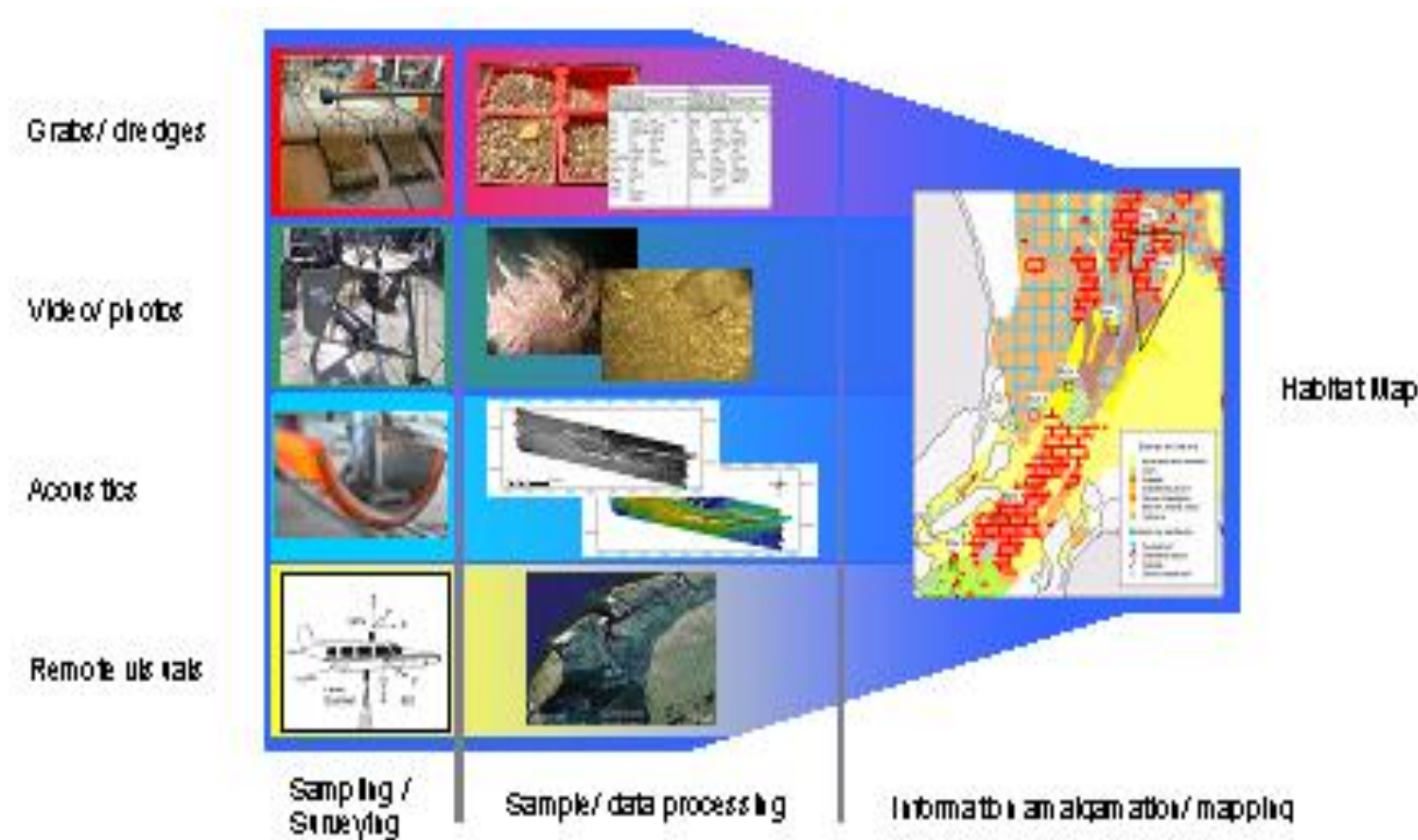
- The next stage is to develop survey specifications.
- This require knowledge of different survey or data collection strategies which involves the use of both:
 - remote sensing, and
 - direct sampling techniques.



Standard Data Collection

- Why do I collect mapping data in a standard way?
 - The answer to this question relates to the method by which data are collected so that it can be extracted, interpreted and displayed on maps.
- Data collection requires technical knowledge:
 - marine technology, biology, geology, taxonomy and basic science.
 - surveying techniques as several techniques are used in parallel to provide complimentary information of the same area.

Standard Data Collection



Survey Techniques [1]

Optimize remote sensed data

- In remote sensing (RS) surveys, not all instruments work optimally in the same conditions (e.g. speed, altitude, depth)
- Careful consideration should be given to the ‘most important’ (principal) instruments to ensure that data is collected to an acceptable quality.
- Types
 - Optical remote sensing techniques (e.g. satellite imagery, aerial photography and LIDAR) are effective on the shore and in clear shallow waters.
 - Ship-based surveys use an array of acoustic techniques to image the seabed, with higher frequency systems like multibeam or sidescan sonar are effective in deeper waters

Survey Techniques [2]

Optimise the ground-truthing

- Ground validation and collection of representative samples from a survey area allows for data values to be segmented to reflect different ground types (supervised classification).
 - sample the physical and biological components of a particular ground type to enable it to be characterised as a habitat.
 - verify classification scheme with the appropriate habitat definition (top-down classification).
- Types
 - Shore-based ground-truth surveys tend to favour direct observation
 - Ship-based surveys tend to rely heavily on sampling devices like grabs, trawls and remote observation (video & 'stills' cameras).

Conducting Surveys

- Users must carefully plan the different stages of a mapping programme to ensure that the final products are fit-for-purpose.
- Data collection considerations should include:
 - What to map (aims);
 - Why to map it (objectives);
 - Where new data are required (gap analysis) and,
 - What new field surveys are required to collect that data (survey programme, survey strategy/design, selection of tools).