Cross-Shelf Sedimentation Patterns and Processes

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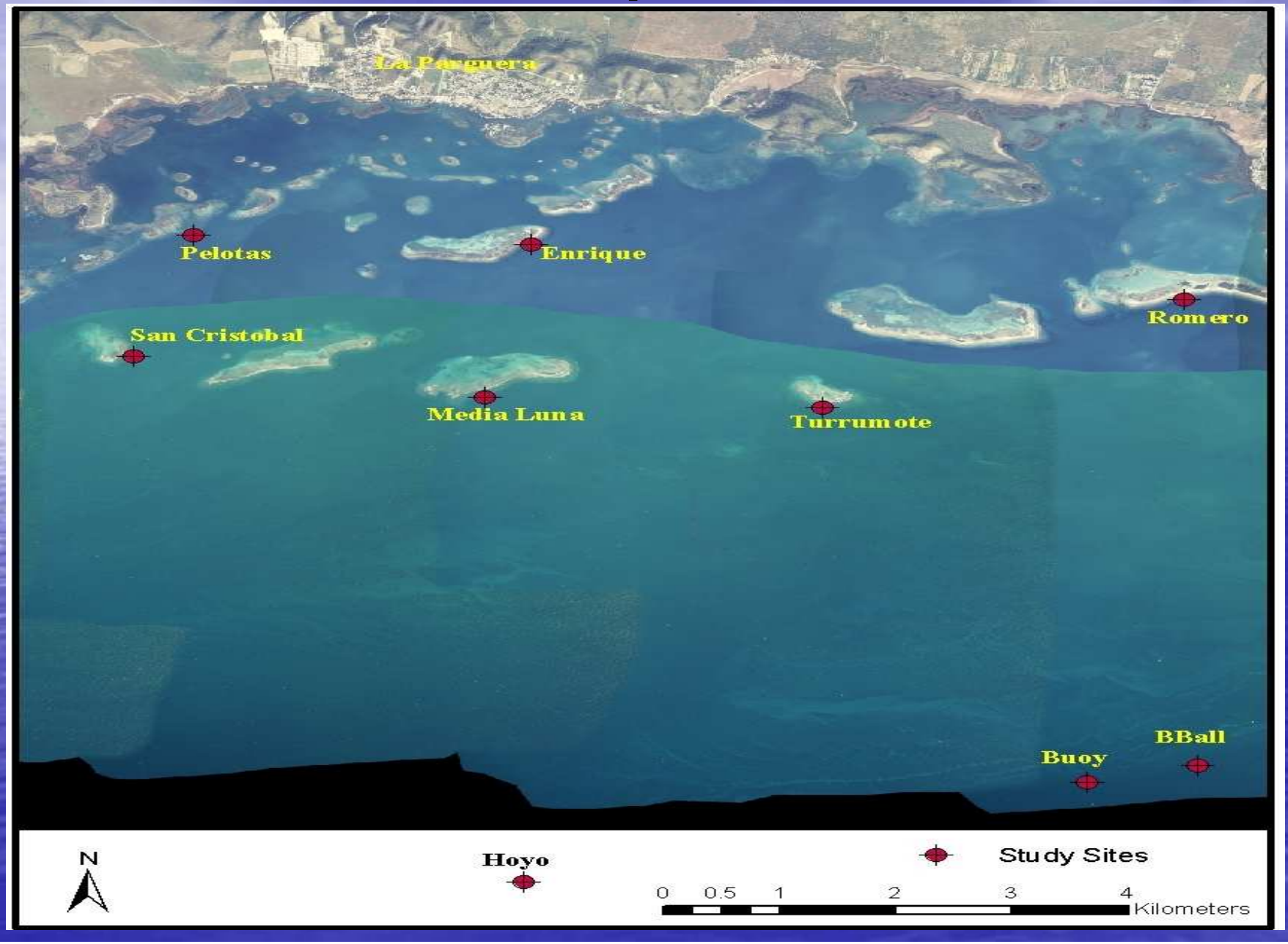
Why analyze sediments?

- Terrigenous sediment can pose a serious threat to the health of reef environments
  - Increased turbidity
  - Negatively impact coral settlement sites
  - Physical stress
  - Chemical stress?
    - Increased organic material
    - Nutrients
    - Pollutants

Is terrigenous material reaching the reefs off La Parguera?

- Locally-derived runoff is probably contained within nearshore areas
- However, offshore reefs may be affected by longshore transport of terrigenous material

Study Area


La Parguera
Pelotas
Enrique
Romero
San Cristobal
Media Luna
Turrumote
BBall
Buoy
N
Hoyo
Study Sites
0 0.5 1 2 3 4
Kilometers

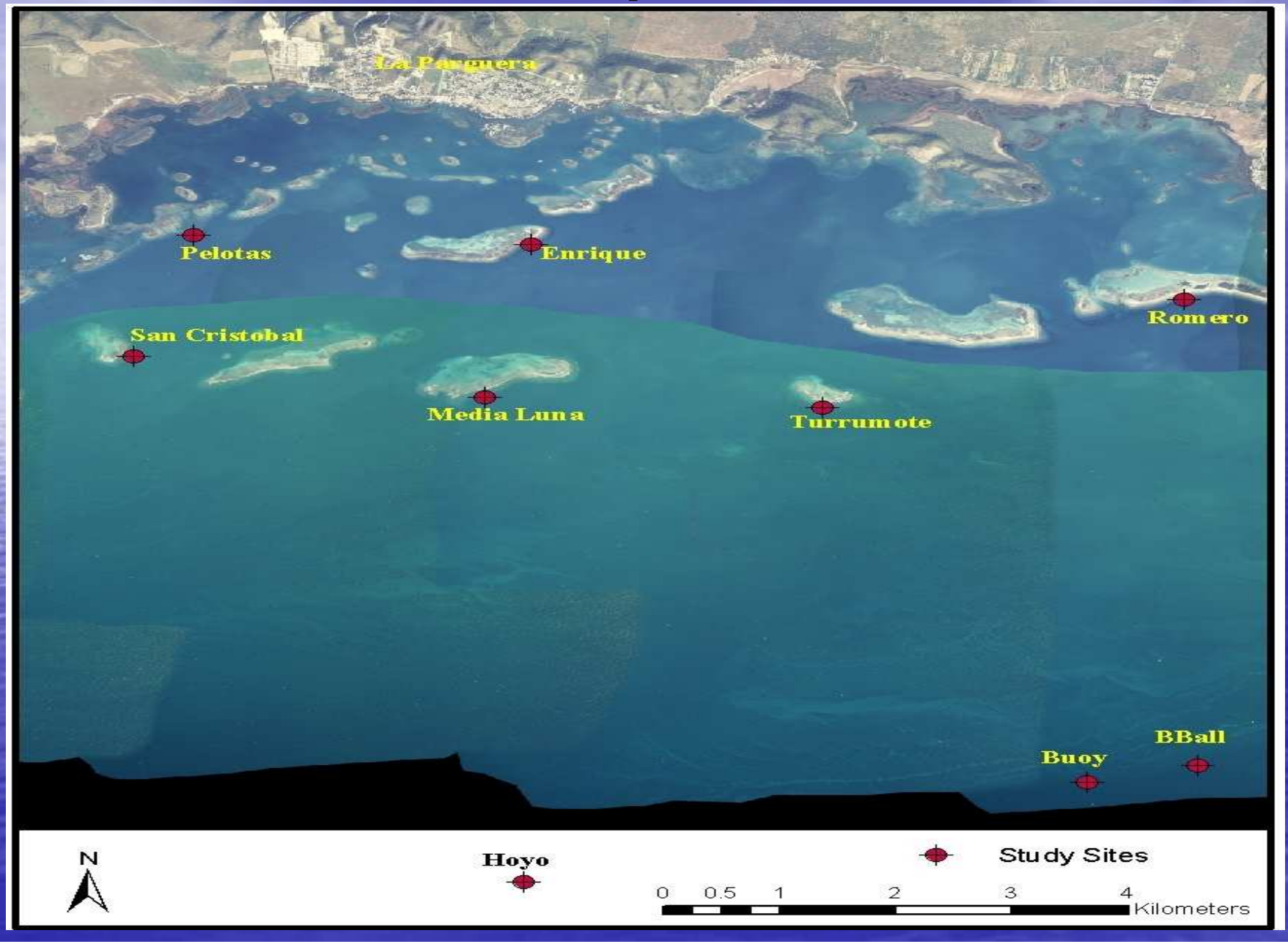
Goals of Study

- Determine the character and composition of suspended sediments accumulating at offshore reef sites
- Use this information to identify primary sources of suspended sediment
- Identify potential effects on coral communities

Approach and Methodology

- Sediment traps have been deployed at reef sites along the three reef trends across the shelf
  - I.e., inner shelf, mid-shelf, and shelf edge
- At each site, replicate traps are deployed at four depths
- Sediment trap samples collected monthly

Study Area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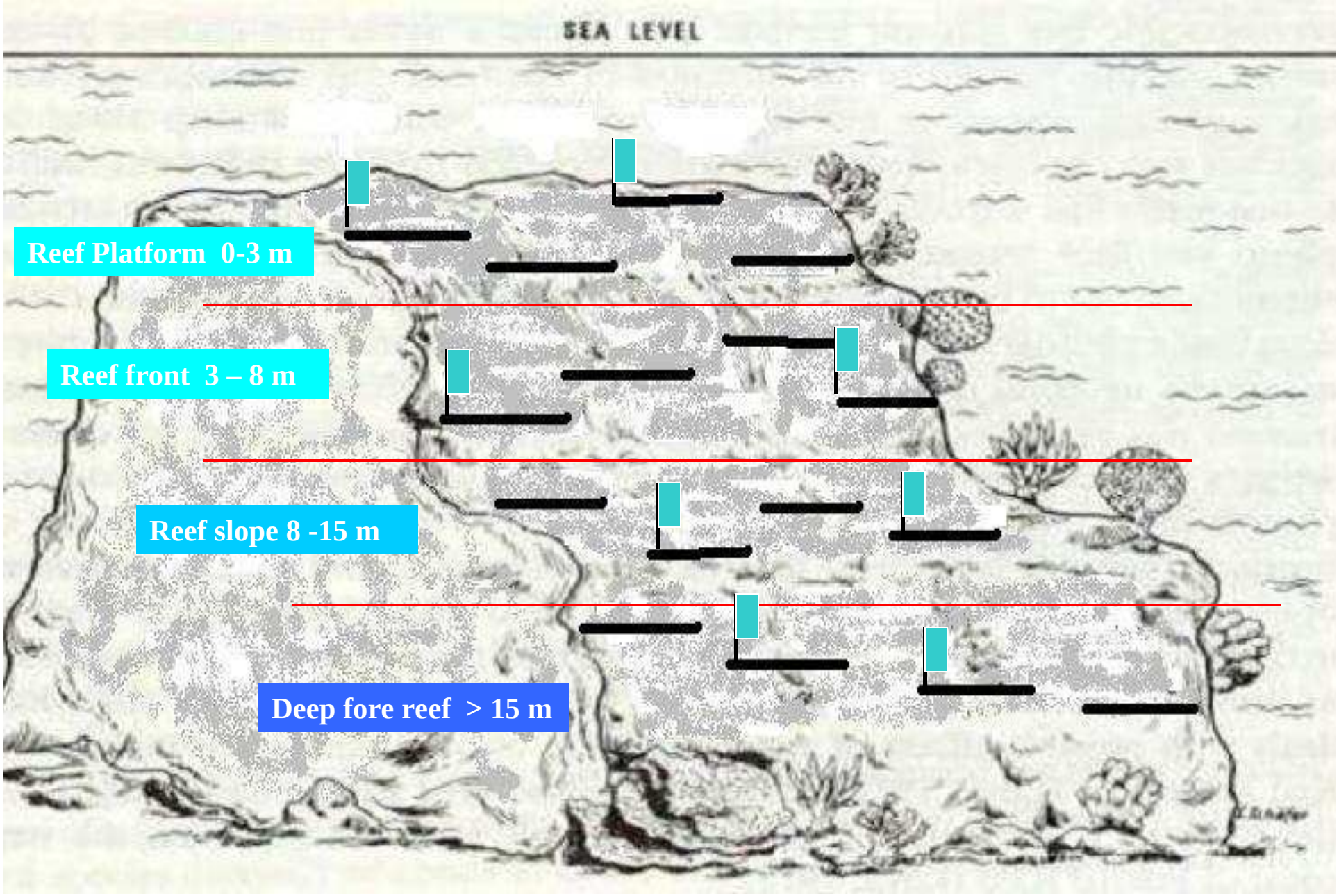
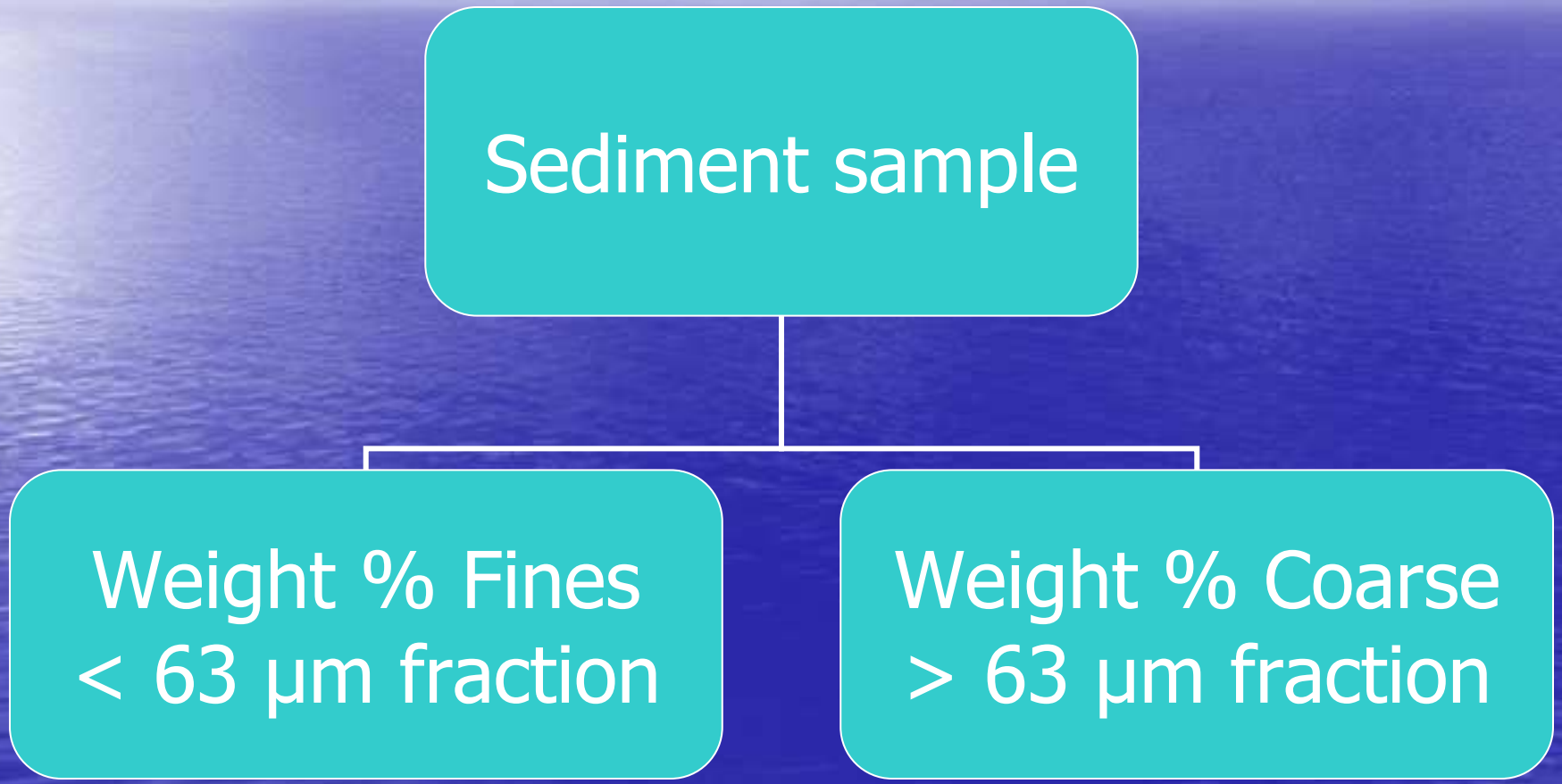
Sampling Design



Approach and Methodology

- Sediment trap

Approach and Methodology



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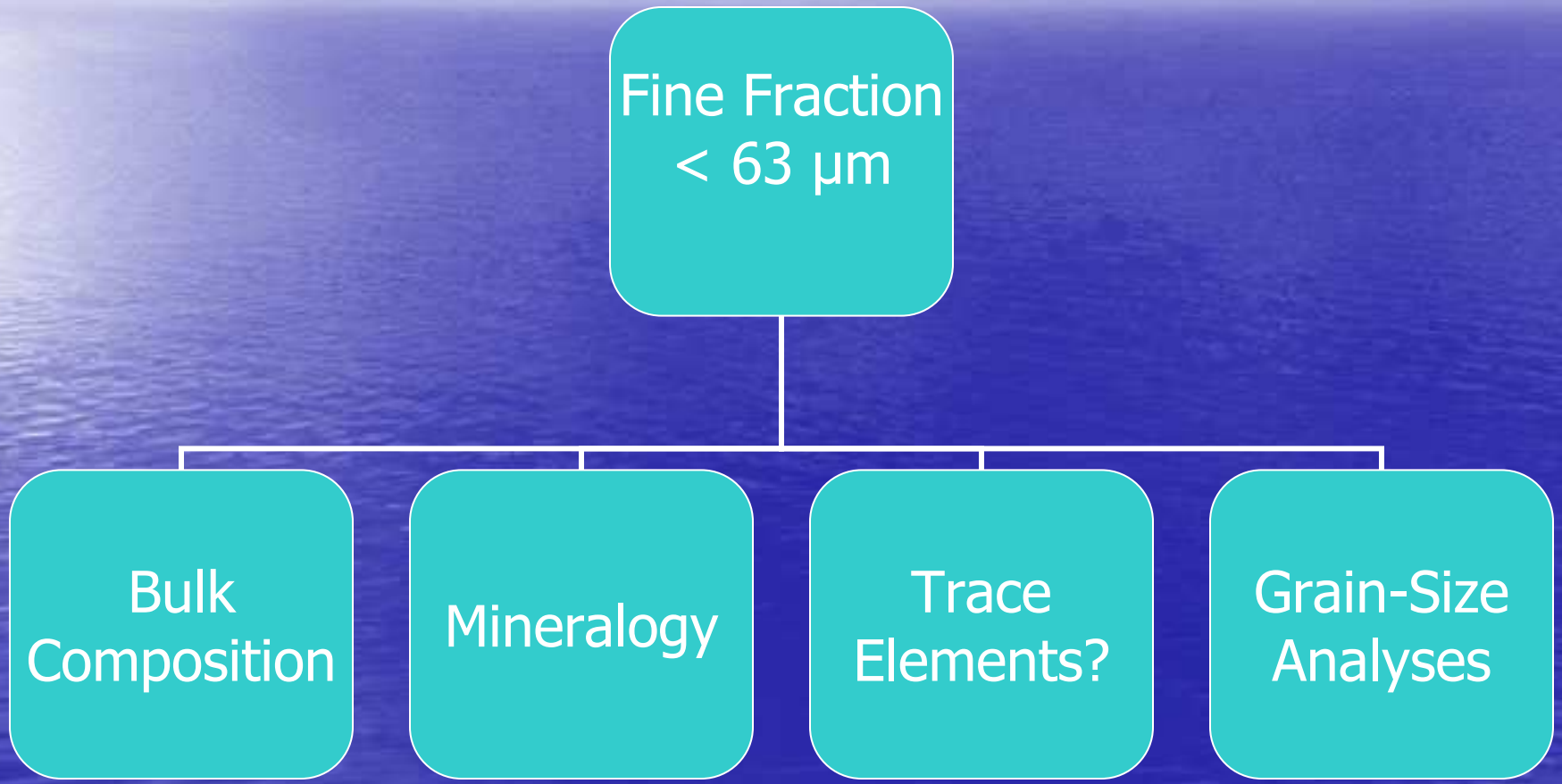

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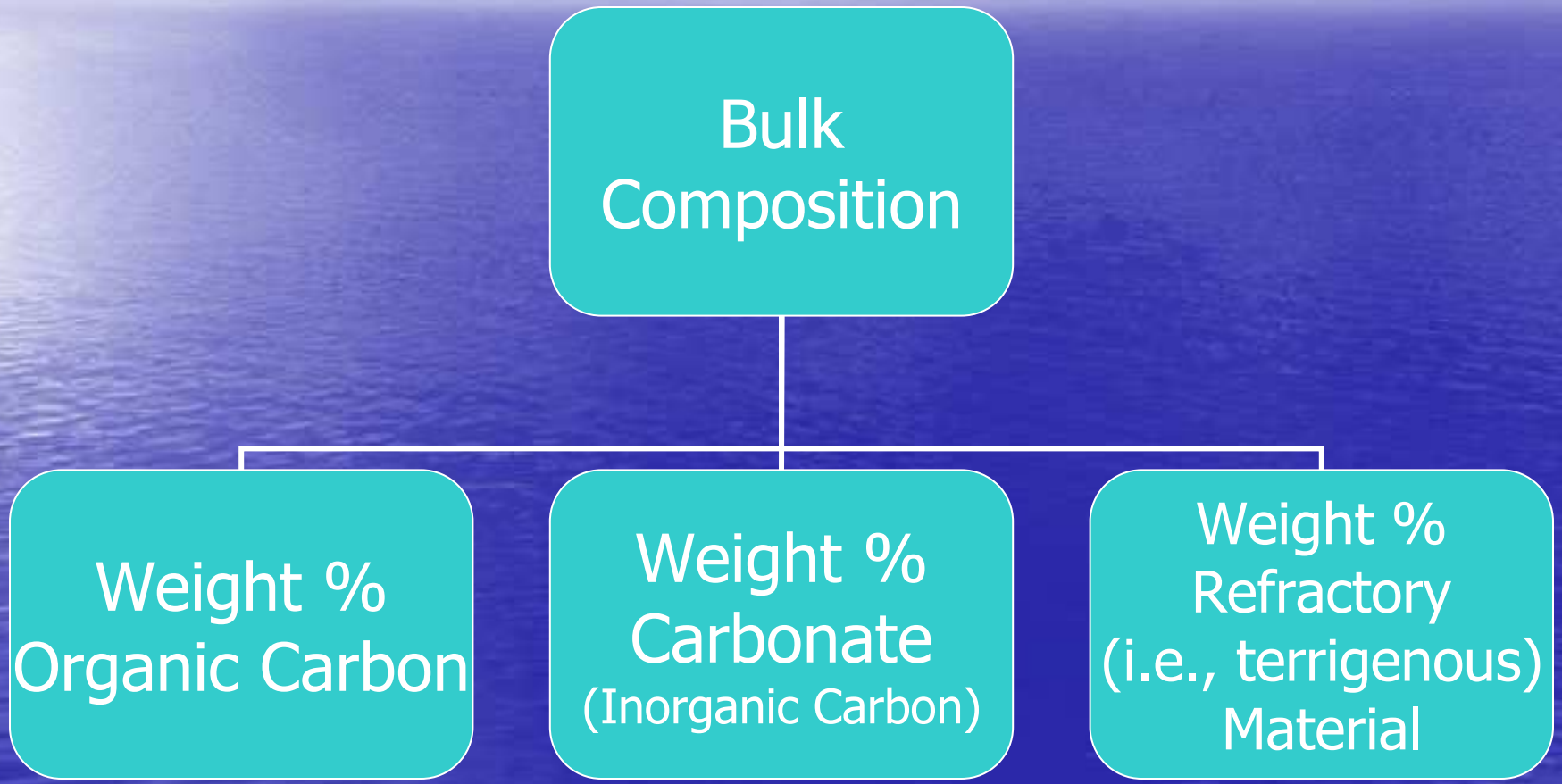
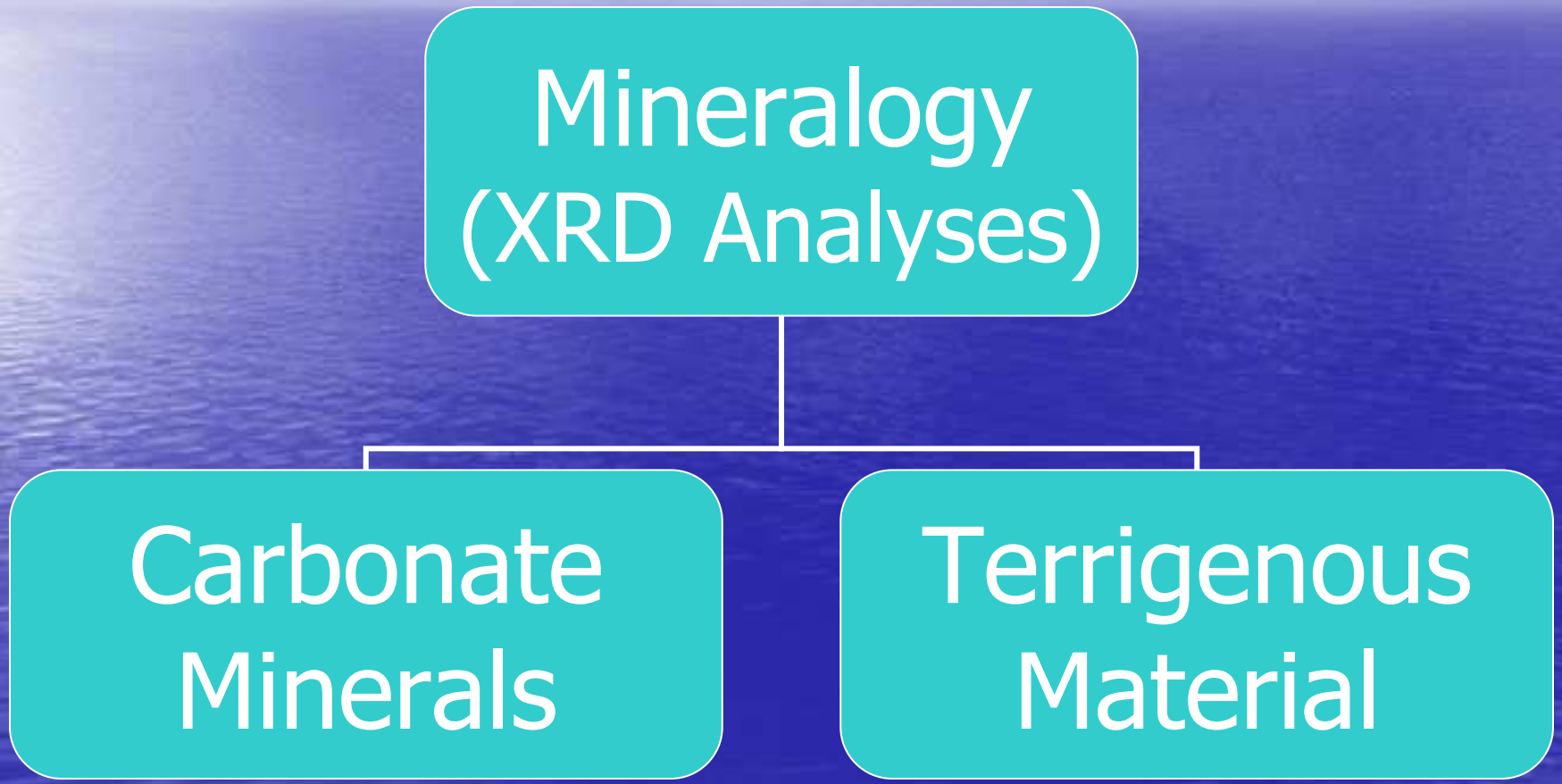


Approach and Methodology



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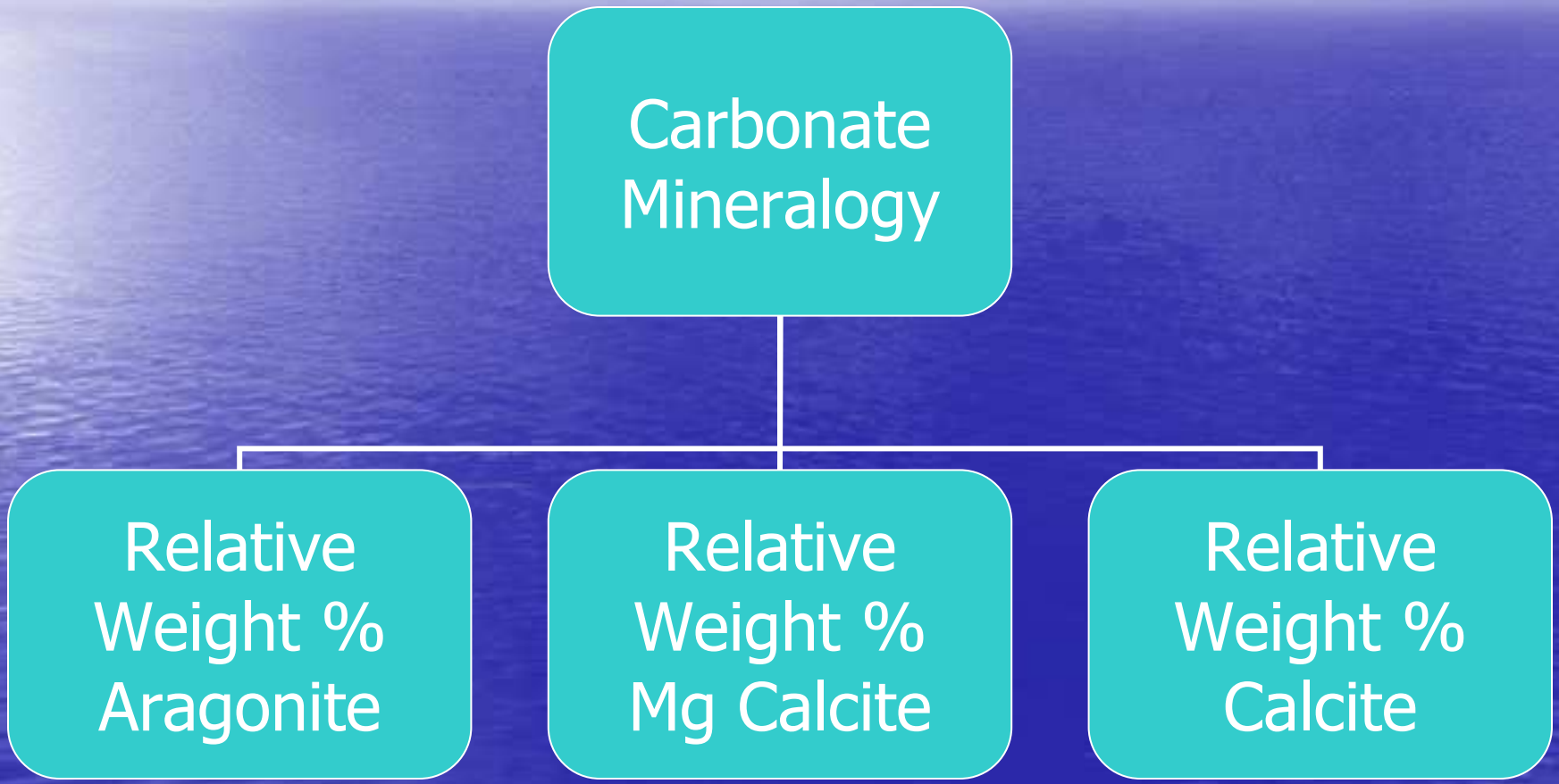

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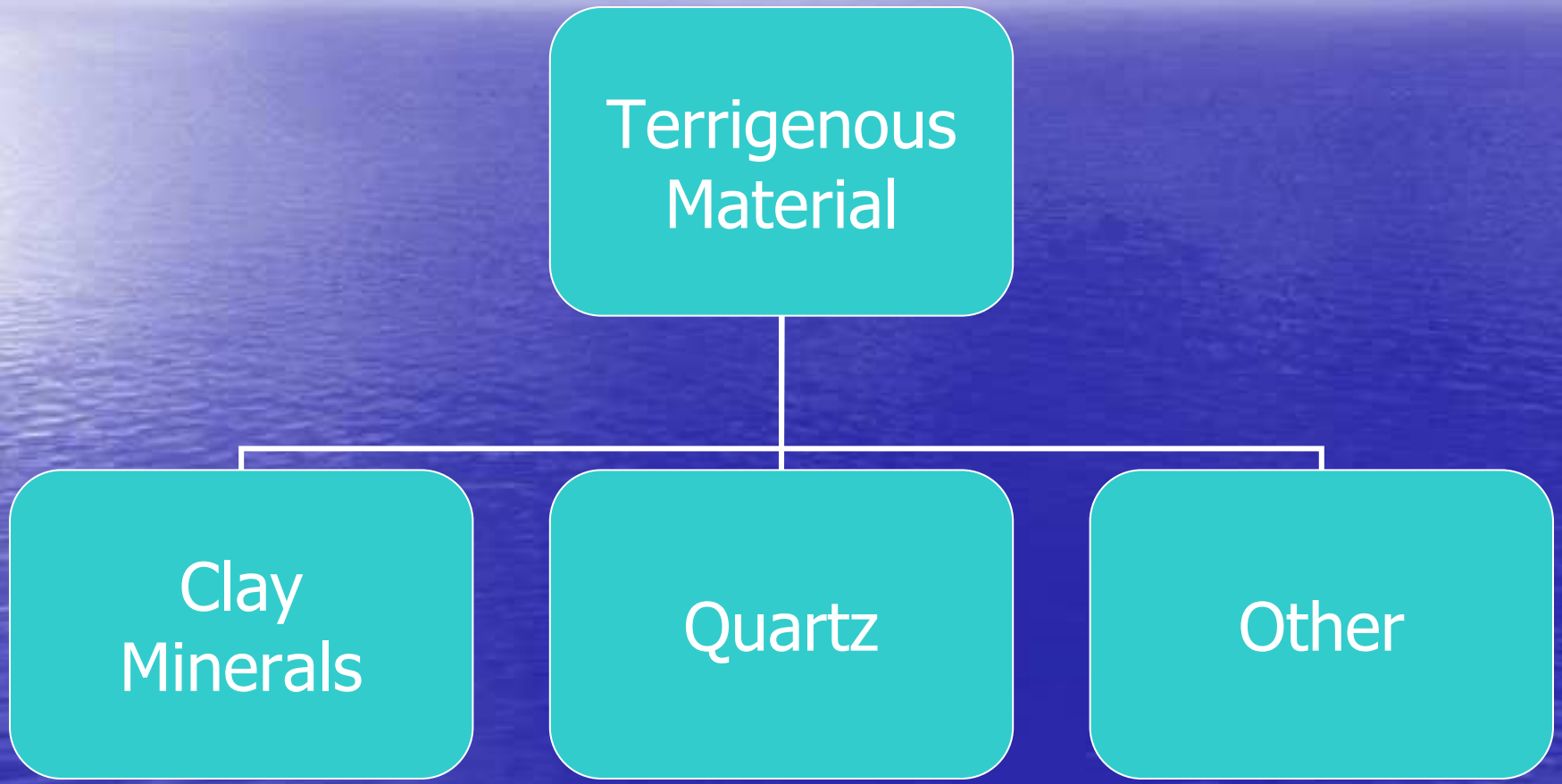
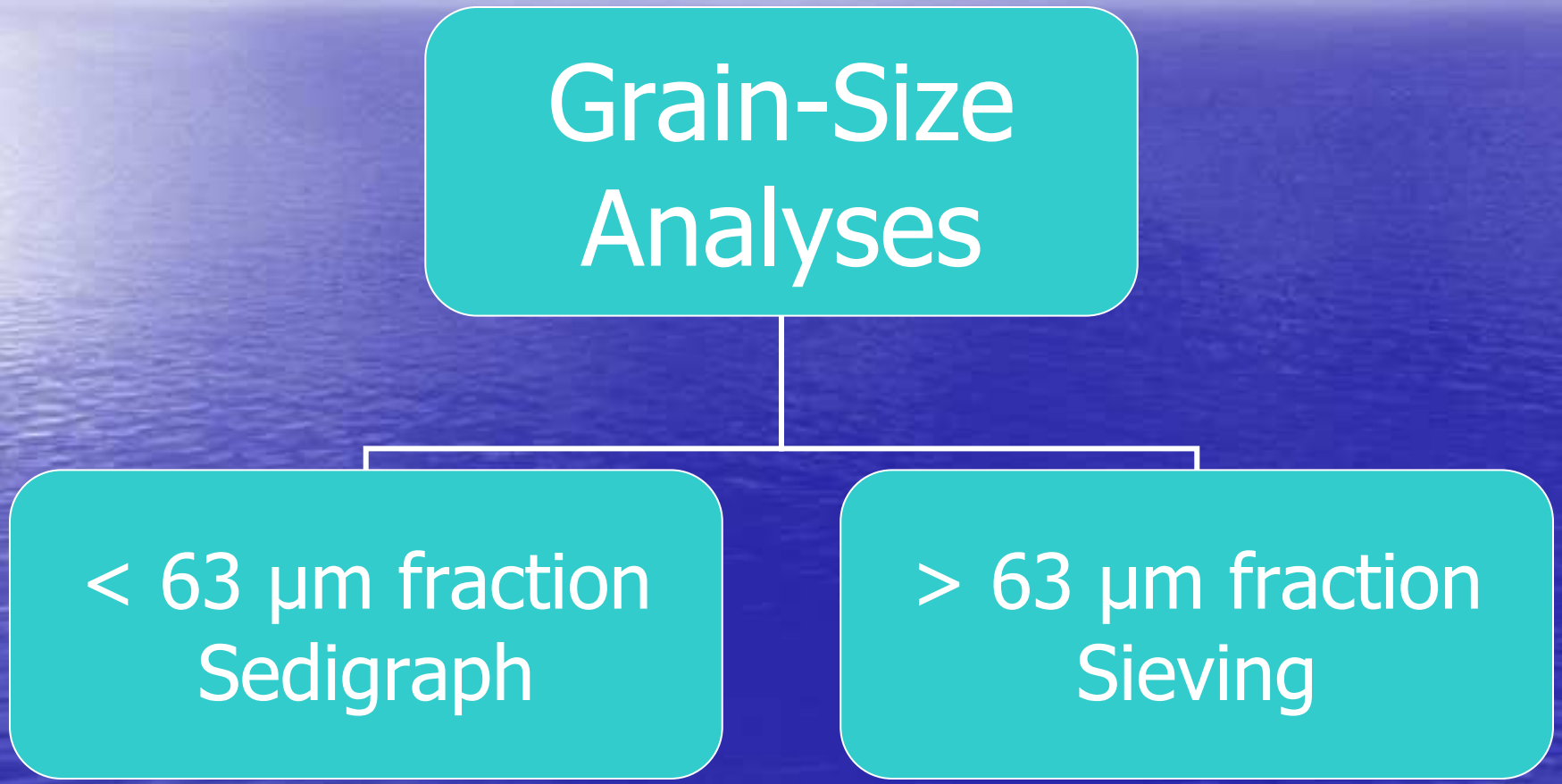


Approach and Methodology

- Trace element analyses on terrigenous sediment?
  - Will depend on amount of sample available
  - Concentrations of trace elements
- Elevated concentrations of heavy metals would indicate pollutants reaching reef environments.
- Techniques?
  - X-ray Fluorescence
  - SEM
  - ICP-MS

Approach and Methodology



Expected Results

- Sediments will be composed mostly of calcium carbonate
  - With much lesser amounts of organic and terrigenous material largely restricted to the fine (< 63 μm) fraction
- Composition and character of the refractory portion of the fine fraction will be critical in determining the ultimate source of the terrigenous material and the influence of terrestrial runoff on offshore reefs

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