

Physics

- What are the expected dilution rates of the added alkalinity?
- What is the site turbulence, and how will this impact alkalinity additions (e.g., keeping particles in suspension)?
- What is the natural light penetration, and what impacts could increases in turbidity have on this?
- What is the residence time of water in the surface ocean or mixed layer, and how does this relate to the estimated air-sea equilibration time?
- What is driving air-sea gas exchange?
- Will changes in turbidity impact the albedo of the experimental site?
- What is the potential for the lateral export and exchange of alkalinity and other materials?
- Is there the potential for physical disturbance (e.g., impacts of alkalinity additions on physical water mass parameters such as density or the physical impacts of adding undissolved minerals to the benthos)?
- Where will the alkalinity signal be most observable (e.g., pore water vs. water column)?

Chemistry

- What are the natural carbonate chemistry conditions?
- What modes of variability (e.g., daily, seasonal, interannual) impact seawater chemistry?
- How will variations in seawater chemistry impact signal to noise?
- How will seawater chemistry impact mineral dissolution rates?
- Is there potential to disturb the natural concentrations of macro- or micronutrients or toxic metals through dissolution by-products?
- How do anthropogenic sources of alkalinity interact with (and potentially modify) natural sources and sinks of alkalinity?

Biology

- What organisms (benthic and pelagic) are present in the study area, and what are their relative sensitivities to fluctuations in seawater carbonate chemistry (if known)?
- Are there culturally or commercially important species present?
- Are there endangered or rare species present? Is the site a nursery and/or nesting ground? Are there keystone species and/or important primary producers present? These considerations will likely be part of the permitting process.
- Are there times of the day or seasons with elevated species or ecosystem sensitivities?
- What are the trophic dynamics in the environment, and how might the food web be impacted (e.g., shifts in predator–prey relationships)? What are the cascading implications for the ecosystem as a whole? Might effects be transferred beyond the study site via migratory species?
- Could particulates (e.g., ground rock) cause physical damage prior to dissolution?