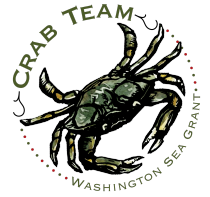


Advanced Tide Timing (201 and 301)

Find your Benchmark: A choose-your-own-adventure activity!

The key to precision planning for your site is determining the **benchmark**, the tidal elevation that describes when the traps are accessible or not. Answer the following questions to identify what reference point you should use for your benchmark, and see the next section for information on how to determine the tidal elevation of these reference points (they are color coded to help you find them).

1. Does the spot where you place traps retain any water on a typical negative low tide?
 - a. **No** - The site is most likely characterized as an **open beach, tidal flat, or a channel without a sill**. The best approach to time trapping is to **determine the elevation of the ground** where to place traps. This is the "benchmark". Plan to set traps just as the tide is returning to that height, and retrieve them just as the tide is dropping below that level.
 - b. **Yes** - Go to Question 2
2. What features best describe the spot where you set traps?
 - a. An enclosed **lagoon** that has an open mouth where the water runs in and out relatively freely. - Go to question 3
 - b. An enclosed **lagoon** with a narrow (4' or less in diameter) culvert as the only connection to open water. - Go to question 4
 - c. A **channel** that retains *only salt water* deep enough to fully submerge all traps easily - Your site behaves similarly to a lagoon with a wide opening - Go to question 3
 - d. A **channel** that retains saltwater only in discontinuous puddles and pools which may or may not be deep enough to fully submerge traps - This site behaves similar to a site without a sill. Puddles and pools are good to target to reduce impacts on bycatch, but are not sufficient to protect organisms on low tides. Treat this site as if it were a channel without a sill. - Go to answer 1a
 - e. A **stream channel** that always has **freshwater running** in it, and becomes entirely fresh on the average low tide (all the salt water gets washed out) - While traps might remain wet, marine animals trapped during high tide might experience significant stress from being subjected to fully fresh water on low tides. Therefore, it's best to treat these sites like an open beach or channel without a sill. That is, the benchmark is still the elevation of the ground on which the traps sit, and traps should be set just before the rising tide covers that bench mark and retrieved as soon as the ebbing tide drops low enough to allow you to reach them.
3. Does the lagoon **continue to drain after the tide** level drops below the sill?
 - a. **No** - Treat the **elevation of the sill** as the site's "benchmark". Plan to set traps just as the tide is returning to that height, and retrieve them just as the tide is dropping below that level.
 - b. **Yes** - The safest approach is to set traps based on **what "minimum low water" looks like** at the site: the lowest the site ever fully drains to. Use the sill of the lagoon as a benchmark for setting traps, because the lagoon will be emptiest just before the tide tops over the sill. This might slightly delay the time at which traps become accessible for retrieval until after the ebbing tide is lower the elevation of the sill.
4. Is there a **significant time delay** on water exchange through the culvert? This depends on how big the lagoon is relative to the culvert diameter so it will differ, even with culverts of the same size.



- a. **No** - Treat this culverted lagoon as if it were a wide mouth lagoon - [Go to Question 3](#)
- b. **Yes** - The elevation of the culvert (at the bottom) can be your benchmark. Plan to set your traps just before the rising tide reaches the benchmark and water flows through the culvert into the lagoon. However, retrieval time is likely delayed as the lagoon will drain more slowly than the tide drops. Start with the time the ebbing tide drops below the benchmark height for the culvert then add a **site-specific time delay**

How Do I Determine:

- The tidal elevation of something at my site? e.g., Sill, traps, culvert, benchmark

A low-budget (and time tested!) way to determine the tidal elevation of anything is to watch the site as the tide comes in, and note the predicted tide height on a tide chart at the time that water first reaches that spot. This works slightly better on the incoming/rising tide than the ebbing/falling tide, and calm, flat days are better than windy, wavy ones. Note that there might be offsets relative to the local tide station (a site might be slightly ahead or behind) and they might be different for rising and falling tides. Nevertheless, this should be relatively consistent if the same tide station is used for planning.

- What minimum low water is at my site? How do I tell if there is bottom draining?

The best way to get to know a site is to see it at its most exposed - when the water reaches the lowest point of the year. This reveals the footprint of the retained water even under the most extreme situations. The water will always be lowest right before a site starts to "re-fill", so visit the site before a returning tide crests the tidal elevation of the sill. The *longer* the low tide, the better chance the site has truly drained as much as it ever will.

- Whether there is a time delay in filling/draining?

This involves tracking the flow into/out of the site/lagoon relative to the height of the water outside the site. If the water level is noticeably higher outside than inside a lagoon, and if the water is flowing in as rapidly as the opening will allow, it's likely the exchange is restricted enough that a time delay will influence timing. In this case, it is useful to learn how long it takes after the water starts flowing in or out, until the level changes to the height needed for trapping. One "low tech" way to figure out the lag time is to sit and watch the tide come in, or go tide go out, and see how long after the lagoon starts draining (after the predicted tide height drops lower than the top of the culvert) the traps become accessible. Showing up with a picnic and a frisbee early on an ebbing tide can be very instructive! Note that after *longer* high tides, the lagoon might be fuller, it has had longer for water to flow in, so it might take longer to drain back down.

- How fresh the water or streamflow is fresh?

First, note that for liability reasons, we cannot recommend taste-testing your site (not that certain Crab Team staff aren't skilled in this "art"). Some indicators of whether the flowing water is fully fresh at a site include:

- Flow speed: if the flow is stream-like, water that consistently flows fast, regardless of how long it's been since the tide has dropped is more likely fresh;
- Color: Colorless water doesn't give you much information, but water that has a brown color (but you can still see through, clear) is very characteristic of stream flow with high tannins from a terrestrial source - freshwater;
- Barnacles: If barnacles are at your site, but you stop seeing them below and even cutoff height, that could be a sign the water at low tide is too fresh for them to survive.