Field Collection Guidance

1. **Observations** – these can be recorded in the red field notebook or on the back of the data entry sheet. Record things that are unusual or might impact the local water quality
    a. Stories
        i. Ukumehame – surfer close to shore right in front of sampler and just "hanging out" during sampling process. Gets out of water immediately after we have sampled
        ii. Polanui – a dozen SUPs traveling in shallow water fronting a couple of sites may have stirred up sediment in area
        iii. Papalaua – campers with 2 tents and 2 vehicles in small cramped area 5 to 10 feet from water's edge
    b. Unusual events
        i. Fires
        ii. Different water color
        iii. Trash with liquid component
        iv. Resort ground crews doing maintenance
        v. Swimming pools draining into storm drain
        vi. Bad smells
        vii. Clear erosion problems
    c. Streams running
    d. Heavy rains within 24 hours of sample collection, especially rains that are local in nature
    e. Excessive algae growth or smell
    f. Equipment malfunction or concerns
    g. PICTURES! Please take cell phone pictures when documenting unusual conditions.
2. **Sample Collection**
    a. Always rinse turbidity and sediment sample bottles 3 times before collecting the sample. Fill the sediment bottle only to the neck of the square edge.
    b. Wait until the surf is bringing water in towards you to take the sample in front of you so that you minimally impact the sample you are grabbing.
    c. Rinse the bucket 3 times and fill the bucket only to the line marked on the bucket to reduce the chances of submerging the probes too deep.
    d. Minimize handling the syringe filters to prevent contamination.
    e. Store the nutrient bottles upright in the cooler.
3. **2100Q Turbidity Measurements**
    a. Nephelometer – measures suspended particulates by employing a light beam (source beam) and a light detector set to one side (often 90°) of the source beam. Particle density is then a function of the light reflected into the detector from the particles. Our turbidity meter uses this technology to measure the clarity of the water.
    b. Salt water is corrosive!!! Please be careful with meters to keep salt water off of the meters and take care to not get any water inside the sample cell compartment.
    c. Do not forget to re-suspend any sediment in the turbidity bottle before you begin your measurements. Gently invert the bottle several times to ensure

all the sediment is re-suspended before rinsing the sample cell 3 times with the sample and then using the 4th fill as the test sample.

d. Glass vial needs to be clean, no fingerprints, scratches, dirt on outside of vial.
e. Keep the bottle threads free of water using a Kimwipe. This prevents water (particularly salt water) from getting inside the sample cell compartment.
f. Blot the sample cell dry rather than wiping.
g. Gently invert the sample cell when re-suspending particulate matter so that you do not introduce bubbles into the sample vial.
h. Blank measurements – the important blank measurement is done back in the lab when the vial is cleaned well with tap water and distilled water. This data may be necessary to determine the final turbidity measurement when the water is very clear.
i. When returning to the lab, don't forget to clean the sample cell well with tap water first (rinse inside and outside of sample cell and cap at least 5 or 6 time), and then rinse 3 times with distilled water before refilling the vial. Then the post blank measurement can be done.
j. Secondary standards verification – quality assurance step that provides us with reassurance that the measurements you get in the field are as accurate as possible.

4. HQ40D Measurements (Temperature, pH, Salinity, Dissolved Oxygen)

a. Salt water is corrosive!!! After every sample site, rinse all 3 probes well with tap water and then rinse with distilled water to minimize the amount of time the probes are subjected to seawater. Take care to keep any liquid away from the probe connectors – water is not good for connectors.
b. Use a towel to dry hands before handling the meters and probes. Also be careful of wet sleeves dripping on equipment.
c. There are temperature sensors on each of the three probes. Temperature is an important factor for all three of these probes to get the most accurate results. The temperature sensors take some time to reach their final temperatures. Therefore, **allow all 3 probes to sit in the sample bucket for at least 2 minutes before taking any readings**.
d. When taking readings, make sure the probes are not sitting on the bottom of the bucket. Pick up a probe(s) and gently stir the sample before pressing the read button.
e. The dissolved oxygen measurement is dependent upon temperature, atmospheric pressure, and the salinity of the sample. Always connect the dissolved oxygen and salinity probes to the meter at the same time.
f. The salinity value we read from the probe comes from converting conductivity to salinity units and the conversion takes temperature into account.
g. The pH reading is also dependent upon temperature, so again it is important that the temperature sensor has had sufficient time to settle.
h. Observe the temperature on all of the probes when making measurements. Be sure to make a note if the temperature sensors on the three probes differ more than 0.2 degrees C.
i. If you notice a value on any of the probes that does not make sense, make another measurement. If you don't get the same measurement each time you press the read button, continue taking readings until you get 3 readings that

are the same value. If this continues to be an issue with a particular probe, make a note of it and report an equipment concern to your team lead.

5. **Back to the Lab**
    a. When you are ready to bring the equipment down to the lab, make sure the probes are securely held in place in the HQ40D field case. The pH probe is allowed to be loose in the depression by the field meter. This allows the probe to stay hydrated in the KCl solution. The salinity and dissolved oxygen probes go in the top of the case.
    b. First step is always to put the nutrient samples in the freezer and any sediment samples in the refrigerator.
    c. There is a lab procedure taped to the cabinet that directs what needs to be done in the lab.
    d. When washing up bottles, syringes, and filter holders in the lab – remember to wash the syringes and filter holders first (no turbidity or sediment bottles in with the syringes and filter holders). This is done to ensure that the syringes and filter holders are as clean as possible. These items should be washed in an Alconox solution and rinsed with tap water. Before putting these items on the rack for drying, rinse them in a bath of distilled water. The turbidity and sediment bottles can then be washed in the Alconox solution and rinsed with tap water. They do not need to be rinsed in distilled water. Dry bottle caps and syringe filters on a clean orange microfiber towel.
    e. Look over the data sheet to make sure everything is filled out correctly. Make sure to sign the chain of custody form for the samples collected in the field. Fill in the field notebook with observations and stories.
    f. Do the turbidity post verification checks, including washing the sample cell used during testing and then refilling with distilled water. Test the blank.
    g. Soak the 3 probes in distilled water for 5 minutes and then carefully dry with Kimwipes. Allow the probes to air dry before storing back in the case.