Rocky Intertidal Station
Conservation

Antropogenic Stresses vs. Natural Stresses

~ Antropogenic Stresses are those stresses imposed on the Rocky Intertidal due to human activities.
- Acute Stresses are disturbances that occur in a discrete area and are usually a large event (Ex: Oil Spill)
- Chronic Stresses are disturbances that operate at a low level over a long period of time (Ex: Collecting and gathering organisms)

~ Natural Stresses are those that are imposed on the Rocky Intertidal naturally by the environment
- This stresses include variation in wave action, exposure to air, topography, salinity, and temperature.
- These stresses have complicated interactions that are always affecting organisms at the species, population, and community level. This often makes it hard to detect the effects of human activities.

Humans Activities That Harm the Rocky Intertidal

1. Oil Spills (Acute Stress)
   - Different species have varying tolerances for oil spills. Barnacles and newly settles spat usually have a high tolerance for oil spills. Grazing mollusks have a very low tolerance.
   - In the past, the clean up efforts preceding an oil spill have done more damage to the intertidal than the actual oil spill. The dispersants used have been toxic to the marine organisms living in the clean up area.
   - It can take 10-15 years for the key species to recover.
2. Toxic Algal Blooms (Acute Stress)
   - Traditionally this stress was considered a natural stress. Algal blooms naturally occur around the world at different times of year based on nutrients present in the water.
   - More recently the frequency of algal blooms has increased due to eutrophication (release of excess nutrients like nitrogen). The nutrients come from fertilizers and sewage brought to the ocean by rivers and streams.
   - These blooms can lead to dead zones. These are areas in which the level of oxygen in the water is reduced below the level needed to sustain life.
3. Heavy Metals (Chronic Stress)
   - Many metals in small amounts are used metabolically by organisms, but in larger quantities can be toxic.
   - Heavy metals enter the intertidal environment through sewage, industrial discharge, dumping, and urban run-off.
   - Higher concentrations of heavy metals can affect individuals by affecting

larval development and later growth as an adult. They can also affect the reproduction in adults.

4. Collecting and Gathering (Chronic Stress)
   - Humans have gathered intertidal organisms to use as a food source, as fish bait, and as animal feed. They have also been collected as beautiful souvenirs. In all cultures and through all ages pretty things have been collects for personal adornment, interior decoration, and as a form of wealth.
   - Intertidal organisms are especially susceptible to gathering because many of them are sessile (non-motile) or have very little movement during low tide (confined to tide pools).
   - Not only does the collecting and gathering directly affect the species being taken, but it also indirectly affects the other organism in the community. It disrupts predator prey relationships, symbiotic relationships, and many more.
5. Plastic/Trash (Chronic Stress)
   - Plastic was introduced in the 1920's. It was regarded as an ideal material because of its versatility and durability. Some plastics are derived from natural substances, but most are synthesized from petroleum.
   - Many of the problems created by plastic simply stems from people not throwing away their trash. Plastic manufacturing also creates problems. During manufacturing of plastics, large amounts of toxic chemicals are released into the environment.
   - In the intertidal plastics can harm marine organisms. They can easily be mistaken for food. Animals often eat plastic that looks like natural food. Plastic bags and pieces of plastic sheets may be mistaken for jellyfish or squid floating in the water. Fragments of broken plastic, Styrofoam, and plastic resin pellets may look like fish eggs or other small aquatic animals. Plastic debris may cause illness or death from choking, intestinal blockage, ulcers, malnutrition, starvation, or a buildup of toxic chemicals in the animal's body.
6. Trampling and Habitat Degradation (Chronic Stress)
   - Habitat degradation occurs when people collect organism from shore or when they trample over organisms to gain access to the ocean waters.
   - Trampling can decrease the number of sessile organism as they get torn away from the places they are attached. This creates bare areas where opportunistic organism can come in and take their place. This upsets the balance of the entire community.