

Station #3: Ocean Surface Conditions

Location: Along the jetty to the left of the entrance stairs (Please be respectful and do not stand in front of other visitors)

To See:

Look out over the ocean. Do you feel any wind? How hard is it blowing?

To Do:

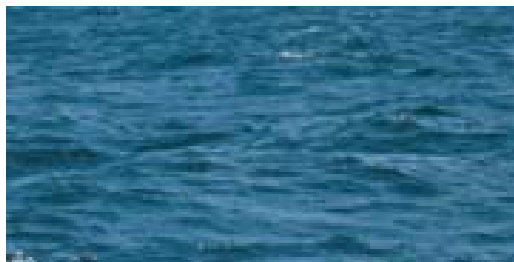
Point in the direction the wind is blowing from. Describe how the surface of the ocean looks? What causes the waves and water to move? Can you identify the type of waves?

Count the number of waves that break on the beach in one minute.

To Know:

The normal waves that we see at the beach are caused by wind blowing across the water surface. Different size waves form depending on where the wind is blowing and for how long and how strong. The wind that you can feel can cause ripples and wind chop, but the wind that formed the swell and breaking waves can be caused by winds blowing 1,000's of miles away.

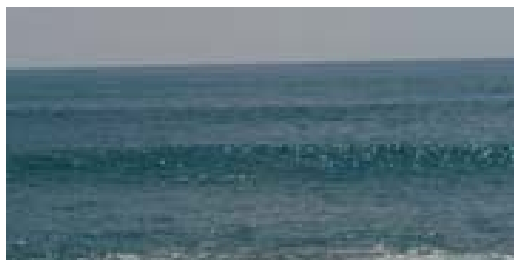
Ocean Surface Conditions



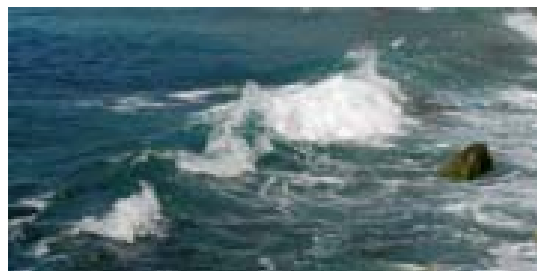
Wind chop - 'messy' looking water with no pattern caused by local wind.



Whitecaps – waves that break in the open water not the shore.



Swell - the regular wave motion formed by the natural separation of different waves as they travel from their source.



Breaking wave – a wave whose base can no longer support its top, causing it to collapse. This happens as the bottom of the waves 'feels' the bottom and slows

Station #2A: Sense the Ocean

Location: Remain in the jetty area but move to the left of the stairs and benches. Please be respectful and do not stand in front of other visitors.

To See:

Face the ocean. Look, listen, smell, and feel the ocean environment around you.

To Do:

Describe the ocean with as many senses as you can. How does it make you feel?

Station #2B: Tidepools

Location: Remain in the same location. We are not going into the Refuge on this tour.

To See:

What do you see along the shoreline? If you were an intertidal animal is this a good day for you? Are you still underwater? Are there people walking on you?

To Do:

What is high and low tide? Look out along the shore line. Do you think it is high tide or low tide? Now look at the Tidepool ID Sheet. Were you correct in your answer?

Are the tidepool animals more at risk from people during high or low tide? Count the number of people you see in the refuge. What is the human impact today: light, medium, or heavy?

To Know:

The Dana Point Marine Life Refuge encompasses an intertidal zone, commonly called the tidepools. The intertidal area is the area that is covered and uncovered by the changing tide levels each day. These tides are mainly caused by the gravitational pull of the moon. Tidepools occur when there are rocks at the shoreline. Rocks provide a place for animals to attach and shelter from the waves. To see the tidepool animals you must come at a low tide when the rocks are uncovered.

The intertidal habitat is a harsh environment. While the plants and animals are adapted to the natural challenges, they are not adapted to the human impact they are now exposed to now. Researchers have come up with a system to rate the human impact in the intertidal area. Below is the human impact scale.

Number of people

0 – 20
20 – 40
Over 50

Impact scale

light
medium
heavy



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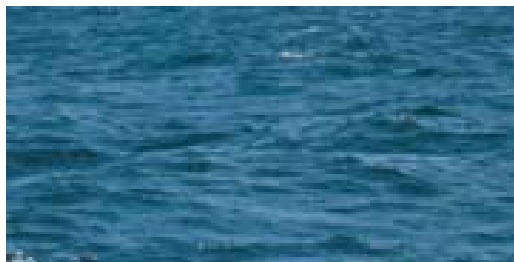
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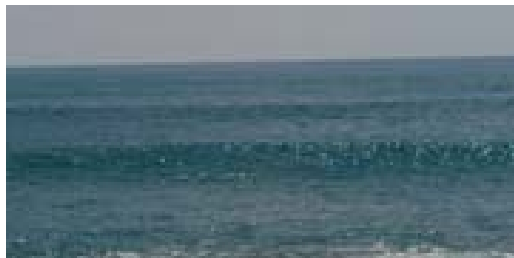
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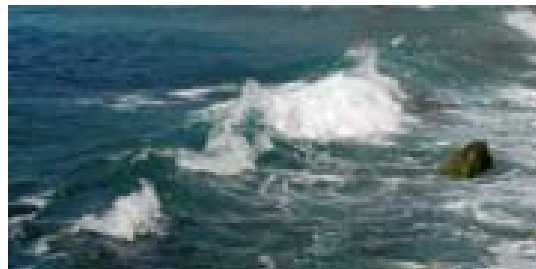
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Station #4: Jetty

Location: Walk down to the corner of the harbor at the picnic tables.

To See:

Look around at the harbor. What do you see? What do you think this long pile of rocks is? What does it do? Does the water surface inside the harbor look like the ocean you just saw? Why or why not?

**To Do:**

Use the Harbor Surface Conditions guide to identify the surface conditions.

To Know:

The West Jetty is a long pile of rocks also called a breakwater. Breakwaters are structures constructed on coasts as a coastal defense or to protect an anchorage from the effects of waves, weather, and longshore drift. It is what protects the moored boats and makes it a protected harbor. A harbor will have calmer water conditions than the open ocean.

Harbor Surface Conditions

Glassy – no wind or waves disturbs the surface so it looks like glass.



Ripples - Ripples appear on smooth water when the wind blows, but will die if the wind stops.



Boat wake – Boats displace the water leaving a V shaped wave behind them that travels out away from the

Station #5: Harbor Intertidal Animals

Location: Walk along the harbor rail away from the jetty and stop anywhere.

To See:

Look over the rail to the rocks below. What do you see? Are there any fish swimming around? Are any animals out of water or underwater on the rocks? What are the animals doing?

To Do:

Using the "Harbor Intertidal Animals ID" card identify the animals you see. While walking along the rail to the next station, count the crabs you see. How many did you count? How many crabs do you think live in the harbor?

To Know:

Many intertidal animals do not live in the intertidal area inside the harbor. The harbor water is warmer than the ocean. Because many animals need the waves crashing on them to bring them food, they cannot live in the harbor.

Here are four animals you should be able to see. The limpet is a type of snail (mollusk) that grazes on the small algae growing on the rocks. The barnacles are glued to the rocks and cannot move. At high tide they will use their feathery feet to sweep food particles into their mouth. Shore crabs are scavengers and will eat available dead organisms or small algae growing on the rocks. They often hide in the crevices between rocks. The opaleye perch lives in shallow water when young and moves off shore when it grows larger. They can grow to 2 feet in length.

Harbor Intertidal Animal ID

← Limpet



Shore Crab →



← Barnacle



Opaleye Perch →

