

# Salinity's Impacts on Marine Life – Tutorial Script

How are marine organisms affected by ocean salinity? To answer that question, let's explore our own relationship with salt and salty waters.

When we put salt crystals on our tongues, the crystals dissolve. What does that mean?

The "SALT" in the ocean is really just a lot of dissolved ions surrounded by clinging water molecules, and that's what we taste when we put salt on food – we're not actually tasting the solid salt, but the dissolved ions of sodium and chloride in our saliva.

So why does the ocean salt taste so much like the salt we put in our mouths? Because the number one dissolved ion in the oceans is chloride. And the number two is sodium -- just like salt!

But also in the oceans there's more than just dissolved sodium and chloride. There's also dissolved sulfate – And magnesium – And calcium – And potassium, and more... many more kinds of dissolved ions.

So water's saltiness doesn't taste exactly the same as table salt. In fact, seawater from all over the world tastes very similar, but there ARE differences depending upon what other ions are also dissolved in the water. While the major ions are the same and found in the same proportion, trace ions can vary and create a unique fingerprint or taste for each ocean location.

Are all ocean waters everywhere in the world equally salty? They're pretty close! But where rates of evaporation are much higher than rates of rain, surface seawater can get up to 10% saltier. And where rain is high or where rivers enter the ocean, surface seawater can get much fresher.

In estuaries like San Francisco Bay, freshwater mixes with seawater, and we can find all levels of saltiness from average seawater to totally fresh.

Can we drink saltwater to quench our thirst? Absolutely not! When seawater enters our bodies, the fresher water in our cells rushes out of those cells to dilute the salty water that we just drank. That process is called OSMOSIS, and we can't stop it from happening inside our body's cells. When we feel thirsty, it's because our bodies NEED more water. And drinking saltwater would just cause our bodies to lose even more of the fresh water they want to replenish.

Do our skin cells lose water in the ocean when we swim in the ocean? Absolutely! While we swim, the water in our skin cells moves outward through osmosis into the ocean in an attempt to dilute the salty fluid outside the cell. Of course the salty fluid outside the cell is the ocean, so diluting it is an impossible job.

If fish didn't have processes they use to regulate osmotic water loss, they would dehydrate and die! Instead they drink lots of water – pull the salt out of it with specialized cells in their gills – and then urinate very rarely, releasing most of the excess salt when they do. So fish pee is super super salty!

Next time you're swimming in the ocean, be sure to bring plenty of fresh water to top up your reserves.

Pause now.

[End credits]

**Seawater Chemistry Series:**

Part I: Salty Seas

Part II: Measuring Salinity

Part III: Carbonated Oceans

Part IV: Salinity's Impact on Marine Life

**Salinity Impacts on Marine Life**

Geoscience Video Tutorial

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