



[Return to Monitoring Estuaries](#)

Salinity

[temperature](#) | [depth](#) | [salinity](#) | [dissolved oxygen](#) | [turbidity](#) | [pH](#) | [nutrients](#) | [chlorophyll](#)

Under laboratory conditions, pure water contains only oxygen and hydrogen atoms, but in the real world, many substances are often dissolved in water, like salt. Salinity is the concentration of salt in water, usually measured in parts per thousand (ppt). The salinity of seawater in the open ocean is remarkably constant at about 35 ppt. Salinity in an estuary varies according to one's location in the estuary, the daily tides, and the volume of fresh water flowing into the estuary.

In estuaries, salinity levels are generally highest near the mouth of a river where the ocean water enters, and lowest upstream where freshwater flows in. Actual salinities vary throughout the tidal cycle, however. Salinity levels in estuaries typically decline in the spring when snowmelt and rain increase the freshwater flow from streams and groundwater. Salinity levels usually rise during the summer when higher temperatures increase levels of evaporation in the estuary.

Estuarine organisms have different tolerances and responses to salinity changes. Many bottom-dwelling animals, like oysters and crabs, can tolerate some change in salinity, but salinities outside an acceptable range will negatively affect their growth and reproduction, and ultimately, their survival.

Salinity also affects chemical conditions within the estuary, particularly levels of dissolved oxygen in the water. The amount of oxygen that can dissolve in water, or solubility, decreases as salinity increases. The solubility of oxygen in seawater is about 20 percent less than it is in fresh water at the same temperature.



In estuaries, salinity levels are generally highest near the mouth of a river where the ocean water enters, and lowest upstream where fresh water flows in. **Click on image** for more details and a larger image.

[\(top\)](#)

NOAA Sites

National Oceanic and Atmospheric Administration
National Environmental Satellite, Data & Information Service
National Marine Fisheries Service
National Weather Service
NOAA Research
NOAA Library
NOAA Watch
NOAA Careers
NOAA Staff Directory

NOS Program Offices

Center for Operational Oceanographic Products and Services
National Centers for Coastal Ocean Science
NOAA Coastal Services Center
National Geodetic Survey
Office of Coast Survey
Office of National Marine Sanctuaries
Office of Ocean and Coastal Resource Management
Office of Response and Restoration

NOS Headquarters

For NOS Employees
Equal Employment Opportunity and Diversity Programs
Integrated Ocean Observing System Program
Management and Budget Office

Site Links

Site Map
Acknowledgments
Information Quality
Freedom of Information Act
Privacy Policy



Revised March 25, 2008 | Questions, Comments? [Contact Us](#) | [Report Error](#) | [Disclaimer](#) | [About the Site](#) | [User Survey](#)
Web Site Owner: [National Ocean Service](#) | [National Oceanic and Atmospheric Administration](#) | [Department of Commerce](#) | [USA.gov](#)

http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar10c_salinity.html