Measuring salinity

Salinity is a measure of the amount of salt dissolved in water. Salinity can be measured with a refractometer.

A refractometer uses the angle of refraction, how much light bends as it crosses the boundary from one medium (air) to another (water). This is described by Snell's law:

\[
\frac{\sin \theta_1}{n_1} = \frac{\sin \theta_2}{n_2}
\]

where:

- \( n \) is the refractive index of the medium
- \( \theta \) is the angle of refraction

The refractive index of water changes depending on its salinity. Light coming through the water into the refractometer is bent more or less depending on the salinity of the water, and strikes a surface with a blue section and a white section. A mirror in the refractometer reflects this surface onto the lens with the scale bars, where you look. How much blue you see depends on how much salt is in the water.

How much salt is in the water?

How does salinity change along the river? How does the river compare to the ocean?