

## CONDUCTIVITY FACT SHEET

**Definition:** The measure of the ability of water to spread an electrical current. Conductivity is dictated by temperature and inorganic dissolved solids, composed of both anions and cations.

### Background:

- Warm water results in increased conductivity levels, therefore conductivity is measured at a standard of 25° C
- Geology of a watershed has a huge impact on conductivity levels
  - Clay soils and groundwater tend to increase conductivity
  - Granite bedrock usually results in low conductivity readings
- Inorganic compounds, such as chloride, nitrate, sodium, and phosphate, are great conductors, and are responsible for conductivity in a watershed
- Organic compounds, such as oil and alcohol, are poor conductors, however still possess the ability to slightly lower conductivity
- Most sewage systems release inorganic compounds, thereby raising conductivity
- Rainfall lowers conductivity (dilution), opposed to droughts which raise conductivity (concentration)
- Each watershed has a typical range of conductivity measurements
- Measured in microSiemens per centimeter( $\mu\text{S}/\text{cm}$ )

### Environmental Impacts:

- Excessive levels of conductivity can wipe out many aquatic plants
- At the same time, all aquatic organisms require at least some ions to survive
- Ranges of different watersheds can be compared to determine relative water quality
- Rapidly increasing levels of conductivity is an indication of pollution

### Water Quality:

- Diverse, and therefore healthy fisheries typically have conductivity readings inside the interval of 150-500  $\mu\text{S}/\text{cm}$
- Recordings outside this range could be an indication of an unhealthy watershed
- Industrial waters have recordings upward of 10,000  $\mu\text{S}/\text{cm}$ !
- Distilled water is 0-2  $\mu\text{S}/\text{cm}$
- Drinking water ranges from 50-1,500  $\mu\text{S}/\text{cm}$

### Sources:

<https://www.gvsu.edu/wri/education/instructor-s-manual-conductivity-11.htm>  
<http://water.epa.gov/type/rsl/monitoring/vms59.cfm>  
<http://www.uvm.edu/~empact/water/conductivity.php>