

## WATER QUALITY

1. **DESCRIPTION:** The event will focus on evaluating aquatic environments.

**A TEAM OF UP TO:** 2                      **EYE PROTECTION:** #4                      **APPROXIMATE TIME:** 50 Minutes

2. **EVENT PARAMETERS:** Each team may bring **only** one 8.5” x 11” two-sided page of notes that contains information in any form from any source, **one student built salinometer/hydrometer for testing** and up to 2 non-programmable, non-graphing calculators. Each participant must bring Z87 chemical splash goggles.
3. **THE COMPETITION:** This event will be composed of three sections of approximately equal point value. This may include analysis, interpretation or use of charts, graphs and sample data. Supervisors are expected to utilize freshwater “lakes, ponds, or rivers” and **estuary** scenarios and have students analyze and evaluate comparative macroinvertebrates, and water quality data. In subsequent years this event will cover estuarine and ocean ecology. Process skills may include equipment use, collecting and interpreting data, measuring, calculating, classifying, and making inferences.
- a. This section will use multiple choice, matching, fill-in-the-blank and/or short answers in areas such as: aquatic ecology, water cycle, nutrient cycling, aquatic chemistry and its implications for life, potable water treatment, waste water treatment, aquatic food chains and webs, community interactions, population dynamics, watershed resource management issues, sedimentation pollution and harmful species.
  - b. Macro-flora and fauna Section will include the identification (common name only) of immature and adult macroinvertebrates and aquatic nuisance organisms, their importance as indicators of water and wetland quality. In addition Division C will also be expected to know the general ecology, life cycles, and feeding habits of all listed organisms.

Class 1-pollution sensitive	Class 2-moderately sen.	Class 3-moderately tolerant	Class 4-pollution tol.	Class 5 Air Breath.
Mayfly	Aquatic Sowbug	Water Mite	Air Breathing Snail	Whirligig Beetle
Caddisfly	Damselfly	Midge	Deer/Horse Fly	Water Strider
Stonefly	Dragonfly	Blackfly	Tubifex	Mosquito
Dobsonfly	Scuds	Flatworm	Blood Midge	Giant Water Bug
Gilled Snails	Crane Fly	Leeches		Back Swimmer
Water Penny				Water Boatman
Riffle Beetle				Predacious Diving Beetle
Water Scorpion				

Aquatic Nuisance Plants: Purple Loosestrife, Eurasian Water Milfoil and Water Hyacinth

Aquatic Nuisance Animals: Zebra Mussel; Spiny Water Flea, Asian Tiger Mosquito and Carp

- c. Water Monitoring and Analysis Section - Students are expected to understand and interpret data related to testing procedures and purposes for collecting data related to salinity, pH, phosphates, turbidity dissolved oxygen, temperature, nitrates, fecal coliform, total solids and biochemical oxygen demand and their relationship to one another. Actual testing will be limited to salinity. Teams must build, calibrate, bring and demonstrate a salinometer/hydrometer capable of measuring **saltwater (most likely NaCl) concentrations between 1-10% (mass/volume). All types of salinometers are permitted but may not use commercially made meters or their parts. Teams should be able to estimate percent to the nearest tenth. Full credit will most likely be given ±1 at Regionals and ±0.5 at State/Nationals. Points for salinity testing should be approximately 5% of the total score.**
4. **SCORING:** Questions will be assigned point values. Students will be ranked from highest to lowest score. Ties will be broken by pre-determined tiebreaker questions.

**Recommended Resources:** All reference and training resources including the in-depth **Water Quality CD** and the **Bio/Earth CDs** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>