

SSI Conservancy Stewards in Training Program

Session 1

WATER AS A SYSTEM

(classroom session)

Theme: Systems are composed of smaller component systems and are themselves part of a bigger system

Objectives:

- ✧ Introduce systems, water system, water quality and its measurement.
- ✧ Demonstrate construction of field journal.
- ✧ Practice field protocols for measuring physical and chemical parameters (pH, temperature, turbidity, salinity and dissolved oxygen) of water environment.

Duration: 90 min

Set-up: water samples outside classroom, sampling equipment set up for group use, laptop and projector set-up in classroom

ACTIVITY	TIME	EQUIPMENT
<p>Introduction: Introduce volunteers, program and next 4 sessions.</p> <p>Introduce Session 1 – systems, context to Ganges Harbour water system, water quality, field journals.</p>	5 min	
<p>Opening Activity - Start with the Crisis – Readings</p> <p>For example – have students read excerpts from Alanna Mitchell’s book <i>Sea Sick</i>, or excerpts from an article on same (see Resource Binder) – ask for connection between the readings and the students’ own personal lives –then offer some info (through inquiry), such as: >80% of the oxygen we breath is provided by phytoplankton in the ocean; ~75% of planet is covered by water; >98% of all water on Earth is in the oceans – so we can call it Planet Ocean – & we are all interconnected with life in the ocean</p> <p>We’ll be using Ganges Harbour as a local study area to place these issues into context – some of the things we might want to understand are water quality characteristics (and if they are changing over time) as this has an influence on life in the water</p> <p>Earth is whole – all the planet’s physical features and living organisms are interconnected – Earth functions as a whole system.</p> <p>What is a system? What are some examples of a system? What are their features?</p>	20 min	<p>Laptop computer</p> <p>Projector</p> <p>Connection to internet</p> <p>Tide table</p> <p>Clipboards - 4</p> <p>Data sheets - 4</p> <p>Field Protocols - 4</p> <p>Buckets 4+4</p> <p>Thermometer - 4</p> <p>D.O. kit – 4</p> <p>Umbrellas</p>

ACTIVITY	TIME	EQUIPMENT
<p>(A system is an entity that is made up of different parts that join together to form an interconnected whole completely different from any one part), e.g. our body – different parts, many processes, all interconnected, self-organizing.</p> <p>Some characteristics of a system:</p> <ul style="list-style-type: none"> ✧ Each part of a system can itself be described as a system ✧ A system can be very different from its parts (i.e. H, O₂ and H₂O) ✧ The system is part of a bigger system <p>Using either 1) Google Earth or Earthwind, project Earth – to view Earth as a system – water cycle is a system of the Earth system – focus in on Pacific Ocean (how does Pacific Ocean influence life on the coast? How is your life connected to the ocean?) Or 2) use satellite images of ocean temperatures or phytoplankton blooms and have students in groups consider these images in terms of the interconnection of systems.</p> <p>Focus in to Strait of Georgia – Ganges Harbour – describe system parts – inputs? Creeks? Estuary? Greater waters? – as a system, what bigger system is Ganges Harbour a part?</p> <p>Activity:</p> <p>1) field journals. Students led in making field journals. Sampling sites assigned to each group. Review of journal pages.</p> <p>2) water quality tests Introduction and demonstration of water quality tests.</p> <p>We'll be looking at plankton and macroinvertebrates in the Biolab. Water quality and characteristics affect life in the water, whether it is marine or freshwater. For example, the occurrence of plankton is in part influenced by salinity, temperature and turbidity. High temperature and turbidity in creeks can affect bottom dwelling macroinvertebrates breathing with gills.</p>	<p>15 min</p>	<p>Safety glasses</p> <p>Latex gloves</p> <p>Waste bottle - 4</p> <p>Turbidity tube - 2</p> <p>Secchi disk - 2</p> <p>pH paper - 4</p> <p>Graduated cylinder - 4</p>

