Title: **Simply Simulating!**
Waterwatch simulations for the classroom

Author: Jeanie Clark,
Wimmera Community Waterwatch Lower Catchment Coordinator
Address: Warracknabeal Vic 3393.
Contact via : Wimmera CMA, PO Box 479 Horsham 3402, Ph 03 53 821 544, Fax 03 53 826 076
Email contact via: wca@wcma.vic.gov.au

Conference theme: Education and Engagement

Topic link: Successes within the school community and curriculum

Session:
- a **workshop** for those who involved in education especially in primary schools e.g. coordinators, facilitators, and teachers.
- Participants should come expecting to be involved in simulations, and are invited to bring ideas of their own to share in the discussion time.
- Maximum number of participants 25.

Workshop Aims:
- Share simulations and demonstrations that I have developed for local Wimmera schools
- Share other simulations and demonstrations from participants
- Stimulate participants to look for inexpensive interactive ways to convey concepts or information

Description
Simulations and demonstrations help engage participants in learning- especially if the participants are directly involved in their presentation! They should answer a question and be fun to do!

In this workshop, I will be sharing some simulations and demonstrations, which I have developed over the last 7 years. They were created in response to upper primary school teacher requests for 'in classroom' Waterwatch sessions for specific events or themes: School Science Fairs, World Water Day, Saltwatch, World Environment Day, and National Water Week (if it fits in with 'transport'!) So they cover global water, water cycle, salinity and water life themes. They vary from 5 minutes to half and hour. Since their creation, all have been reused, many successfully with lower or higher levels, and some for other purposes. Some have needed modifications to adapt them for a new need e.g. a transport focus in a food web simulation. At any time, adapting the discussion during or after their presentation may make them suited to different ages or purposes than their original design (see 'leads into' below).

When creating these simulations and demonstrations, there was little money available from budgets for such things. So I needed inexpensive, common materials to work effectively. Working from home, I need materials that are easy to transport and store. Materials reusable from /for other purposes are even better!

Some examples of such simulations and demonstrations are:
- **How much of world water is rain? (global water cycle)**
  - Demonstrates: world water proportions of ice, groundwater, land waters, air waters and sea.
  - Materials: 4 re-use plastic jars (containing <1 cup, 2 tabs, <2 teas and a drop of water, respectively as above) taken from a 10-litre bucket.
  - Basic Procedure: Identify the 5 global water forms; challenge class to think of rank order by amounts; select 5 children to collect jars and rank selves; present correct rank order.
  - Message: very little of the world's water is good rainwater available for our use, so we need to know how to take care of the good water we get.
  - Leads into: properties and uses of each form; water cycle; protecting and conserving water

- **How much salt is a problem? (salinity)**
  - Demonstrates: different salinity tolerance levels for different species
  - Materials: salty water samples already tested or created, selection of locally common fruit and vegetables and flowers responding to high and low salinity tolerances, toy sheep or other farm animals, (optional) Saltwatch poster,

- Basic procedure: issue water samples and 'props' to children; rank samples e.g. in line or on a Saltwatch salinity groups poster; challenge group to think at what level human salinity tolerance reached – place a drinking glass at that sample; challenge with a couple of others; complete props matching salinity samples. Cards with levels of tolerance help the 'props' to find their place.
- Message: salinity tolerances differ, so grow what is appropriate for the water you have
- Leads into: physical signs of effects of too much salt; actions to manage salinity

- **How is life linked in my local water place? (aquatic web of life)**
  - Simulates: a food web, and changes in life in a place due to Spring and plant loss
  - Materials: brown blanket, green strip of material or crepe paper roll, card per child based on local selection of water species (from aquatic macro-invertebrates to a water bird, and showing the creature and what it eats; or, in a simpler form, plant eater, etc).
  - Basic Procedure:
    Rules : left hand holds creature card so name can be seen, right hand placed on shoulder of creature to be eaten, a dead creature hangs its head, and can only be eaten once!
    Issue creature cards (choose teacher to be water bird) to group around the brown blanket. Describe the changes over spring stopping for each change to be enacted: identify 'pond' (brown blanket); warmth and sunlight = plant growth (add green strip in middle of pond); invite herbivores to feed on plants (green strip); invite carnivores to feed on herbivores (creature of choice); invite detritivores to feed on dead plants or creatures (creature of choice); invite water bird to eat (creature or plant of choice). Create a disaster to remove plant life (whip green away); follow effects: all uneaten herbivores head down = dead; detritivores thrive, carnivores survive some time; water bird flies away!
  - Message: all living things are linked in the water, so take care of such water places.
  - Leads into: importance of plants; Spring and plants; ways to care for such places; creature details

Creek Web of Life Simulation

To modify the web of life simulation for a 'transport' theme, children wore shaped crepe paper 'bug' costumes and used 'bug' body movements.

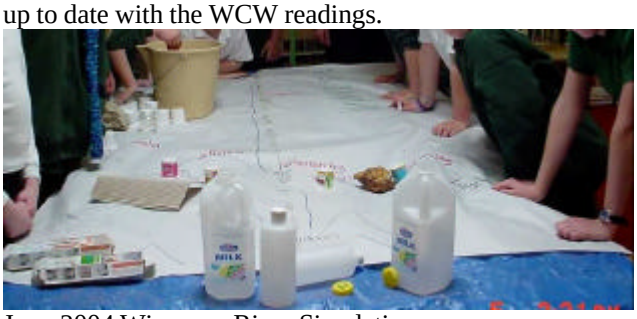
Photos Courtesy of Warracknabeal Primary School, Y1/2, 2003.

Some others:

- Rain fall on land and sea
- Waterwise quiz
- Salt properties in water
- Origins of salt
- The salty water cycle story
- The Salty Wimmera River simulation
- Simulations from the participants

The Salty Wimmera River Simulation

The Wimmera River typically has a complicated salinity graph, instead of continually rising.
I developed this salinity simulation in 2000 to show how and why the Wimmera River's salinity goes up and down in response to inputs from rain and different sources of salt. It has been modified for reuse several times to keep it up to date with the WCW readings.



June 2004 Wimmera River Simulation,
photo courtesy of Mrs V. Huff, Y4-6 Jeparit P. S.

Salty Wimmera River Simulation Materials

- Catchment map from chalk (outside) or textas on a large sheet of paper (inside) big enough for the class to stand around.
- river = 10 l bucket
- rain = 1 or 2 l bottles (e.g. ex –milk) of water
- rocky layers that seep in salt = 2 types of rocks
- plains = corrugated cardboard
- salt measured in ¼ tsp. lots in small (e.g. ex- yoghurt) containers of salt. (In 2004, I used ¼ tsp. = 2500 EC's for a total of 5l of water.)
- big mixing spoon or stick!
- EC scans calibrated at 2 levels

Salty Wimmera River Simulation Procedure

Draw a large catchment map showing key sites for which salinity is known at a particular time.
Tell the story of the river's salinity.
At each site, a child moves in to the bucket (river) on the map to add inputs of rain or salt, from bedrock or aquifers. A child stirs the bucket after each addition, then salinity is measured to see its effect on the 'river'.
At the end, these readings should be close to the real changes in salinity for the river, at a specified time. They can be matched against it to see how real changes are explained.
At Jeparit PS in 2004, this simulation led to other sessions on regional geological history, salinity effects and local actions. These were combined into the "Salty Tale for Bedtime" play presented to the WCMA Kids Conference.