

# Educator Activity Outline

## Biscayne Explorer: Wildlife Inventory and Nature Study

Activity Number: 5

Title: Testing the Water

Location: North Lawn

Objectives:

*(Students will)*

- know that a successful method to explore the natural world is to observe and record, and then analyze and communicate results.
- know that it is important to keep accurate records and descriptions to provide information and clues to causes of discrepancies in repeated experiments.

Summary:

Students will test 3 water samples for salinity. They will use the *Venice System*, just like real scientists, to determine if the salinity levels are where they should be.

Time Needed: 20 minutes

Materials:

Water sample from site #10 at *Caesar's Creek*

Water sample from site #16 at the mouth of *Mowry Canal*

Water sample from site #36/37 at *Mid-Bay*

Salinity testers (3)

*Venice System Table*

Park map with sampling sites

*Explorer Booklets*

Exploration:

**Read (6 min.):** Biscayne Bay is an estuary. An estuary is a body of water where fresh water from rivers and streams mixes with saltwater from the ocean. Water used to flow naturally into Biscayne Bay from the Florida Everglades or "The River of Grass." When people wanted to farm the land and live on the land, it became necessary to drain the land. A big system of canals was built. This changed the flow of fresh water coming into Biscayne Bay.

The fresh water flow is very irregular now. Sometimes a lot of fresh water is let into the bay, other times only a little. This makes the salt levels, or salinity, of the bay go up and down. Think about having a powdered lemonade drink. The more water you pour into the mix, the more diluted the lemonade. If you pour only a little water, you get very strong lemonade. The plants and animals that live in the bay are trying to deal with these ups and downs but can only survive at certain salinity levels. Park scientists test the water regularly and work to restore the natural balance of fresh and salt water in Biscayne Bay.

Salinity is measured in parts per thousand. Suppose you had 1,000 paper cups and filled 965 of them with water and 35 with salt. If you poured all 1000 cups into a big bucket, the salinity would

be 35 parts per thousand. Instead of writing "35 parts per thousand," scientists write "35 ppt" for short. Ocean water is usually 35 ppt, but water in an estuary can be much lower.

**Do: (3 min.):** Park scientists work to keep or restore Biscayne Bay's water to 5-18 ppt. This salinity level is normal for a body of water far away from its fresh water source and in a closed-in area. Study the park map. Do you see why Biscayne Bay is an enclosed body of water? (The Bay is closed in from the ocean by the Keys.) Do you see the canals on the map as well? The canals bring fresh water into the bay.

Now look at the salinity chart that has been provided for you. Find the name given to the level of salinity Biscayne Bay should be at.

**Read (.5 min.):** We are going to test the salinity levels of water samples from three sites in the bay. The locations the water was collected from are labeled on the park map. Sample A is from Caesar's Creek, sample B is from the mouth of Mowry Canal, and sample C is from the middle of Biscayne Bay.

**Do (10 min.):** Discuss which water sample you expect to have the highest salt content and which you expect to have the lowest. Remember that fresh water is coming from the canals.

Using the salinity tester provided, test each water sample. Fill the salinity tester up to the line. The needle will indicate the salinity level. Write the results on the page provided in your *Explorer Booklet*.

Lastly, discuss the results. Did all three samples have the same salinity? If not, what may be causing the differences in how much salt is in different sections of the Bay? Did your results indicate that Biscayne Bay is at the right salinity level?

**Conclusion (.5 min.):**

By looking at historic and current day salinity levels scientists can plan for the future. We all needed healthy water in the past and we will continue needing healthy water in the future. Park scientists regularly test the salinity of the water in the bay and compare the results to previous tests to understand the water flow and predict how it can impact the organisms of the bay. These organisms rely on water with salinity levels they are adapted to, as do we.