A Citizen Scientist Crustacean Watch Project: "Buruquena y camarones en nuestros ríos"

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Introduction

The relationship between land use and biodiversity in tropical streams is a matter of concern for the citizens of the Rio Grande de Manatí watershed. Citizens have perceived that the abundance of several crustaceans' species had decline. They associate this decline with changes in the use of the land (Focal Group). This change is not new, but has been observed in other ecosystems (Trexel and Goss, 2008) and resulted in a loss of aquatic biodiversity (Harding et al. 1998) and changes in nitrogen loading (Turner and Rabalais, 2003). In the tropics, there is a need to study the effects of land use changes in the streams and rivers (Smith et al., 2003).

In this project, citizens will gain experience in monitoring crustacean's species in the Rio Grande de Manatí and its tributaries. As crustaceans are an important aspect of the culinary and social culture of Puerto Rican families, monitoring will provide an alternative view of crustacean diversity and ecology. This will be accomplished by establishing monitoring stations in three different areas of the watershed. Citizens of the municipalities of Ciales, Florida, and Manatí will be encouraged to participate in the monthly monitoring and will also be invited to participate in train the leader workshops. The workshops will be design to motivate citizens to create monitoring groups within their communities to continue the surveys, to analyze data, and to report results using web based tools which will augment the dissemination of their findings. Teachers and students could benefit of this data by using it to learn about statistics and scientific writing.

This experience will provide tools for citizens to insert themselves in the decision making process as they will be educated and will gain control of the natural resources, they will be in a better position to communicate with the government (Irvin and Stansbury, 2004).

Project Description

The objective of this study is to provide citizens with sound crustacean monitor tools to assess the status of species in the streams and estuaries of the Rio Grande de Manatí watershed. Citizens will gain knowledge of the procedures and methods used by the scientific community so that they will be better equip for the decision making processes.

The leader workshops will be conducted by the investigator and it's assistant. At the workshop the citizen scientists will receive instructions and took kit necessary to conduct the survey. The tool kit will include, protocol, sampling gear (plankton nets, shrimp and crab tramp, water quality kit, vials to conserve samples, notebooks). After each survey, every group will organize the data to be entered in the in a web page that will be already created by a contractor. The contractor will train the citizen scientist on how to use the web page. The web page will provide tools for reports, basic statistical analysis, and graphs.

Materials

- camera
- stakes (2)
- martillo
- 100 m metric tape (2)
- Buckets for water samples (3)
- Buckets for crustacean holding (5)
- Multiprobe system (DO, ph, Temp., salinity, TDS)
- Nitrogen and phosphorous kit
- Depth measurer (1)
- Calculator (1)
- Flow meter (1)
- Gee minnow traps (10)
- Drift net (2)
- Kick net (2)
- Basket net (2)
- Water proof paper
- Ethanol
- Pencils
- Pens
- Markers
- Paper
- Computer
- Infocus
- Portable whiteboard easel
- Stereoscope
- Compound microscope

Work Plan

Monthly monitoring will be done in three different areas of the Rio Grande Manatí watershed. At each site the "Protocolo para la evaluación de cuencias hidrográficas"

and crustacean sampling will be performed. Crustacean sampling will be performed by different methods such as gee minnow traps and nets.

Two workshops about how to conduct the river survey, crustacean identification and the use of the web page to enter the data will be offered to the core volunteers.

The results and analysis of the data will be available through the internet which is an available tool for dissemination (Silvertown, 2009). The results of the project could be presented at any local or international conference.

Volunteers

The volunteers will perform the following duties:

1. Water chemistry analysis of the rives
2. Depth and water velocity measurements
3. Visual evaluation of the river
4. Sampling of crustaceans
5. Data entry and analysis

Work Schedule

The project will start in April, 2013 with a workshop where core volunteers will be guided through the steps to monitor the river and to identify crustaceans. After that, monthly monitoring events will occur for the duration of the project.

References

Irvin, R.A. and Stansbury, J. 2004. Citizen Participation in Decision Making: Is it Worth the Effort? Public Administration Review. 64(1): 55 – 65

Silvertown, J. 2009. A new dawn for citizen science. Trends in Ecology and Evolution. 24(9): 467-471.

Smith, G.C., Covich, A. and Brasher, A. 2003. An ecological perspective on the biodiversity of Tropical Island streams. BioScience 53(11): 1048-1051.

Trexel, J. Goss, C. 2009. Aquatic fauna as indicators for Everglades's restoration: Applying dynamic targets in assessment. Ecological Indicators 98:S108-S119

Turner, R.E. and Rabalais, R.N. 2003. Linking landscape and water quality in the Mississippi River basin for 200 years. BioScience 53(6):563-572.