**Homework:**

Prepare a 10 minutes presentation with the following (mostly with photos, figures or graphs)

2. Find out and **discuss**:

a. What were the main questions (or objectives) addressed?

b. How did the authors tackle them? (what did they do?)

c. What aspects could be added/done differently/problems?

**Title:**

**A web-based GIS tool for exploring the world's biodiversity: The Global Biodiversity Information Facility Mapping and Analysis Portal Application (GBIF-MAPA)**

**Keywords:**

Biodiversity mapping, Online Geographic Information Systems, Species richness, Survey gap analysis, Global Biodiversity Information Facility

**Citing:**

Flemons, P., Guralnick, R., Krieger, J., Ranipeta, A. & Neufeld, D. (2007): A web‐based GIS tool for exploring the world's biodiversity: the global biodiversity information facility mapping and analysis portal application (GBIF‐MAPA). *Ecological Informatics*, **2**, 49– 60.

(Flemons et al. 2007)

**Summary:**

**1. Introduction**

“Overall, we are locked into a race. We must hurry to acquire the knowledge on which a wise policy of conservation and development can be based for centuries to come.” E.O. Wilson (1988)

Accumulating global biodiversity data is a key step towards a wise policy of biodiversity conservation. Much of these data exist in natural history and survey collections, but the cost to discover and acquire the data has often been very high.

As of March 2007, the GBIF data portal provides access over the Internet to approximately 120 million species occurrence records from over 1000 separate collections (<http://gbif.net>).

We argue that one way this convergence will occur is through global online distributed biodiversity mapping and analysis applications that streamline the workflow of doing biodiversity science (Guralnick and Neufeld, 2005). Such streamlining will both hasten our ability to generate information and knowledge about biodiversity and avoid costly duplication of survey effort.

We have developed a first generation web-based application called GBIF-MAPA (Mapping and Analysis Portal Application; http://gbifmapa.austmus.gov.au/mapa/) to support survey planning and species richness assessment. The application is a web-based biodiversity workflow tool that provides users the means to semi-automate raw biodiversity data acquisition, geospatial visualization and deployment of core biodiversity analyses based on that data. Building such a global mapping and analysis tool required solving a series of technical challenges; in the rest of this paper we delimit and discuss possible solutions to these challenges and present the particular implementations we employed in developing GBIF-MAPA. We also more fully discuss how the GBIF-MAPA application can be used to acquire biodiversity knowledge in regions of the world known to have tremendous biodiversity but where sampling has been limited. In particular, we provide two case studies showing how GBIF-MAPA functions. One case study examines species richness of rodents in the Ethiopian Highlands, and the other case study shows the use of the survey gap analysis tool for Anura (frogs and toads) on Madagascar.

**2. Technical issues and solutions in developing GBIF-MAPA**

The GBIF-MAPA application was developed to provide an end to end workflow for doing biodiversity-based analyses. This workflow is shown in Fig. 1 and involves a number of separate operations. The first and second steps are to make initial selection of the region and taxa of interest. The third step is to accumulate georeferenced species occurrence results from the GBIF data cache, view results on a map and perform validation steps.

The final step is to submit the species occurrence information, analysis parameters, and (where applicable) environmental information to one of three analysis tools which returns the results to the user. The first tool is a species richness analysis tool (SRA), the second a survey gap analysis tool (SGA) and the last a tool that extracts environmental conditions for selected species occurrences. At each step in the full process, there were critical technical decisions for developing a workable web application.

















