Linaria: an information system to implement GLOCHAMORE project and promote conversion of information into knowledge in Sierra Nevada Biosphere Reserve

BONET GARCÍA, F. J.; PÉREZ-LUQUE, A.J., PÉREZ-PÉREZ, R.

Laboratorio de ecología. Centro Andaluz de Medio Ambiente. University of Granada-Junta de Andalucía. fjbonet@ugr.es

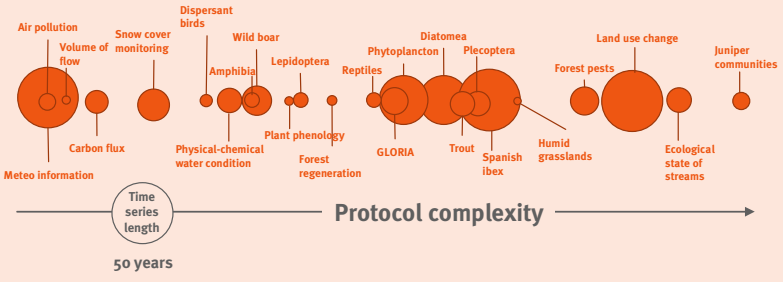
Laboratorio de Ecología del CEAMA

Sierra Nevada Global Change Observatory is a long term monitoring program whose main aims are to assess the effects of global change in this LTER site. The basic objective is to ensure the collection of necessary information to identify as early as possible the impacts of global change, and design management actions that minimize them. The data generated by this set of methodologies must be transformed into useful knowledge for adaptive management of natural resources. The key issues are the ***integration and analysis*** of monitoring data by an information management system, and the ***transfer of current scientific knowledge*** to society and the natural resource managers through effective ***dissemination***.

Sierra Nevada is an isolated high mountain (reaching 3482 m. a. s. l.) located in Southern Spain. It's considered the most important biodiversity hotspot in the Western Mediterranean region. Some descriptive information:

- 2100 vascular plant (25 % and 20 % of Spain and Europe flora)
- 80 vegetal endemic species
- 2000 km²
-Biosphere Reserve (UNESCO)
- Natural and National Park
-61 municipalities
- 90.000 inhabitants

- Information is analyzed and converted in useful knowledge by means of different techniques (niche modeling, spatial analysis, regression, etc.). These algorithms are calculated using a workflow management software whose nucleus is called Kepler (https://kepler-project.org/)
- This useful knowledge is expressed as a set of indicators. We have followed the state-pressure-response paradigm in the design of this indicator system. Results are shown in a web portal where managers and scientist can browse the indicators and download raw data.



- We have created a monitoring program with more than 30 protocols whose methodology have been validated scientifically and collect information for more than 100 environmental variables that are surrogates of ecosystem functions. This figure shows the monitoring protocols. The size shows the length of the temporal series, the colour shows the thematic field, and the position in the x axis shows the complexity of the methodology used.

- Raw data are stored in relational databases that are managed by PostgreSQL. The use of this databases allows us to stablish spatial and alphanumerical relationships between the different data packages. Standarized Query Language (SQL) significantly improves the way information is accessed.

  We are using mobile devices (PDAs, smartphones, etc.) to facilitate the upload of raw data to those normalized databases.

- Metadata are data about data. Using metadata, we are able to document the raw data by means of labeling. Metadata allows to answer some important questions about data: who created them?, How are arranged?, When were collected?, etc.

  This is the URL that we use to harvest the metadata in EML format: http://apps.iecolab.es/linaria/panel/harvestlist?administracion=ceamaneros