

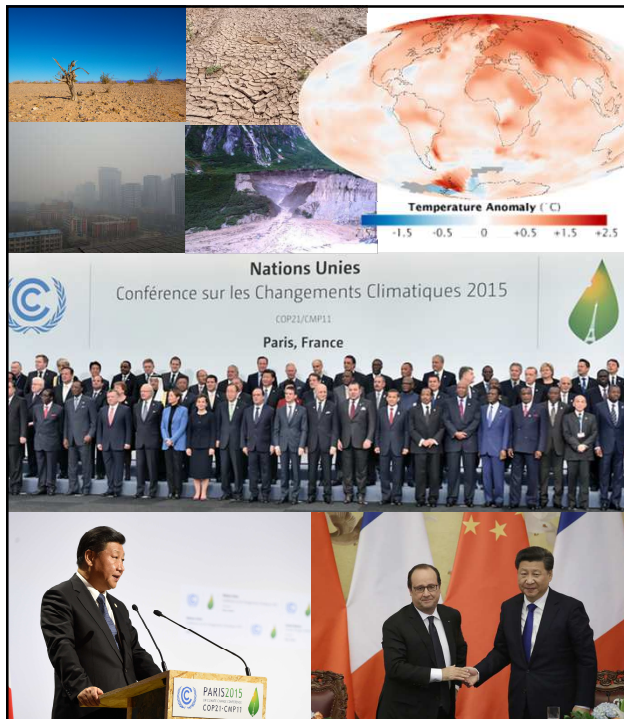


Socio-ecological system : semantic and modelisation

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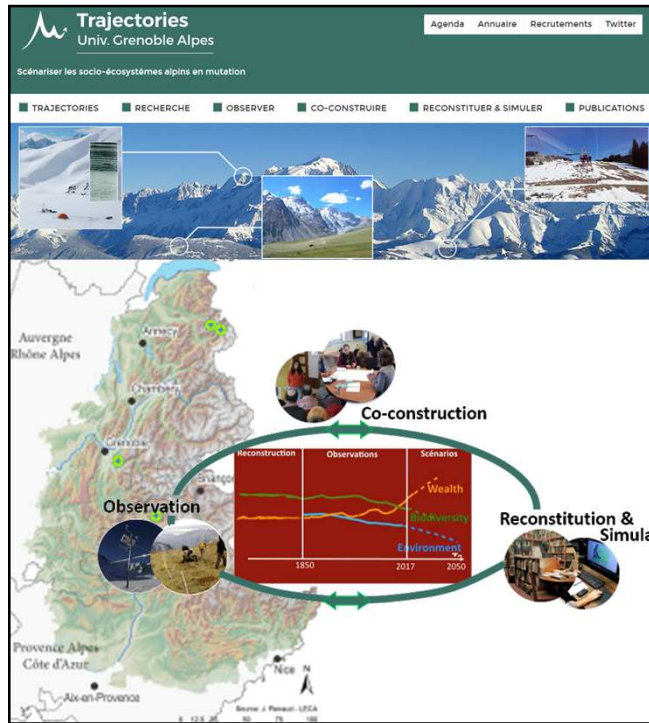
LIG (Laboratoire d'Informatique de Grenoble)
Grenoble Alpes University



Context

- Global Warming and Climate Change
- China and France are very involved in the fight against global warming



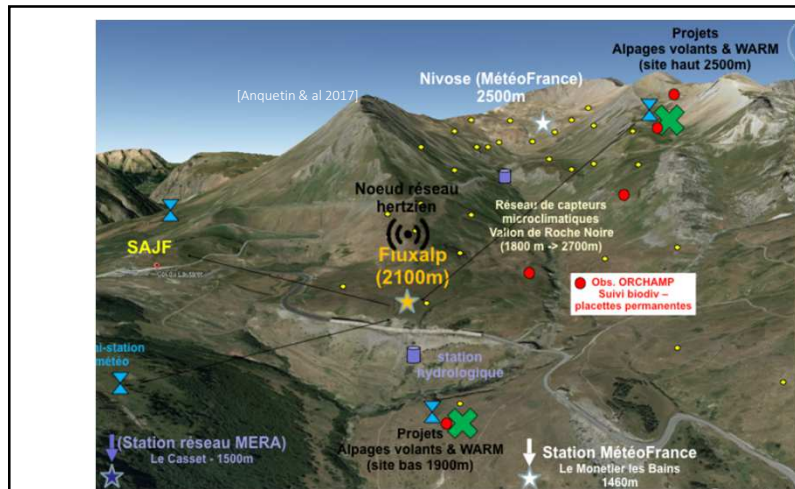


Development of multidisciplinary research programs

Trajectories project at Grenoble Alpes University 

<https://trajectories.univ-grenoble-alpes.fr/>

- 12 research groups : 70 people
- Area of interest
 - 2 alpine valleys (Chamonix Mont-Blanc, Maurienne, Romanche)
 - 2 alpine National Parks (Vanoise, Ecrins)
- Creating fully integrated socio-environmental data acquisition and management system
 - Make interoperable the existing observation platforms
 - Identify relevant observations for dealing with adaptation of territories to climate change
 - Provide novel observation system linking multidisciplinary data



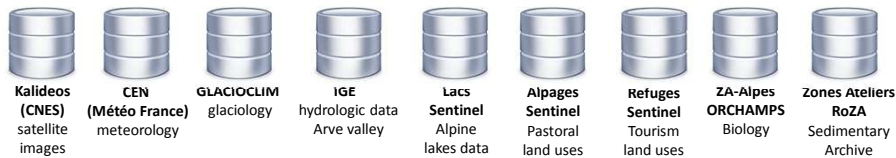
Context of multidisciplinary research programs

Scientific Domains

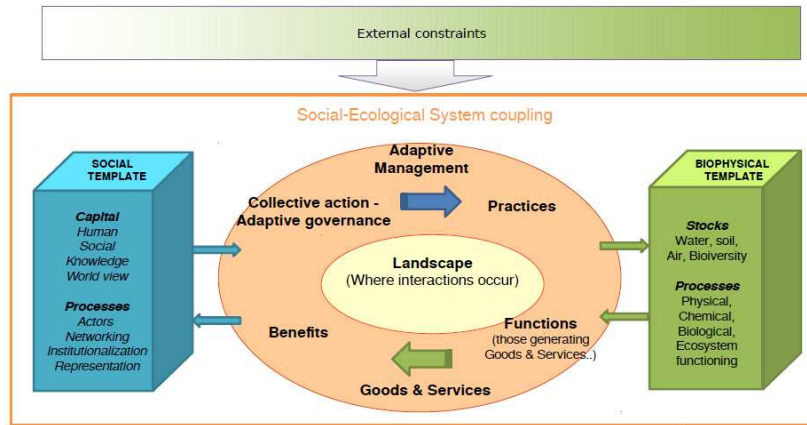
- Climatology
 - climate & microclimate
- Hydrology
- Biology
 - biodiversity
- Meteorology
 - atmospheric
 - precipitation
- Glaciology
 - snow
 - Ice
- Sedimentary Archive

Many Data Bases

[Anquetin & al 2017]

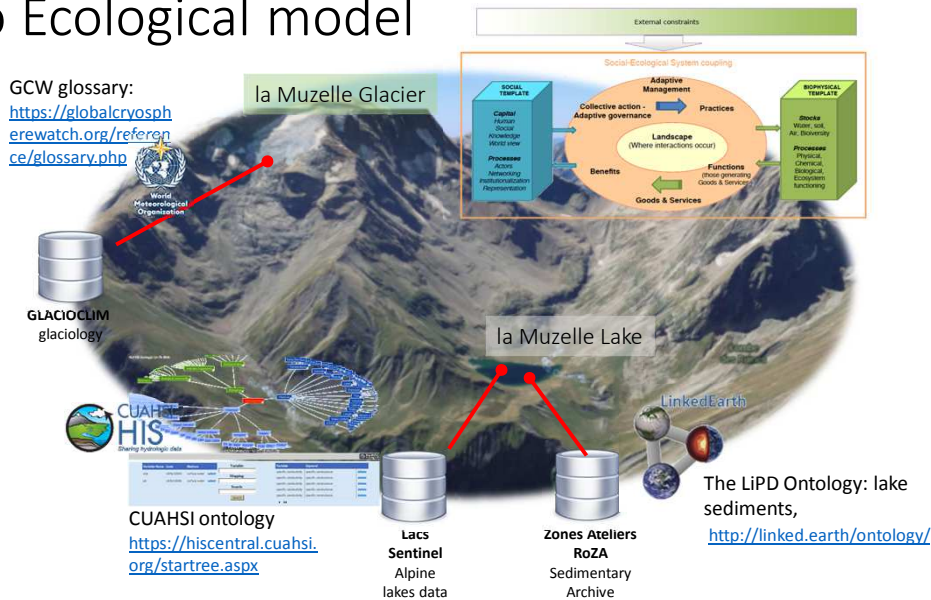


Socio-Ecological System

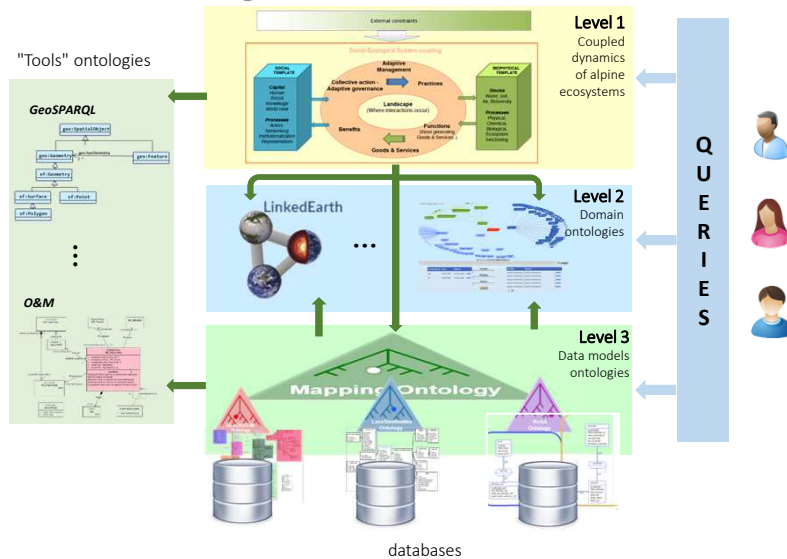


Source: Gardner et al. A social and ecological assessment of tropical land uses at multiple scales: the Sustainable Amazon Network. 2013. Phil. Trans. R. Soc. B. DOI: 10.1098/rstb.2012.0166

Socio Ecological model



Links with ontologies and models



Mutual benefits and interactivities

- Common objectives :
 - sharing, processing, analysis and visualization of data linked to global warming
- Grenoble group's expertise :
 - semantic interoperability of the data, models and processes, which are available in a web of data platform
- LIESMARS group's expertise :
 - know-how in geospatial services to support geoprocessing modelling and environmental monitoring based on GeoJModelBuilder platform



Trajectories platform (LIG)

The diagram illustrates the Trajectories platform (LIG) architecture. It starts with a "User request" that is processed by a "Query Engine". This engine interacts with "Domain 1 Ontology" (Service 1) and "Domain 2 Ontology" (Service n). The ontologies contain data from various sources (Source 1, 2, j, k, n, p, Descriptions). The Query Engine generates a "Query plan" which is then executed through various "wrappers" (wrapper 1, 2, j, k, n, p). These wrappers connect to different data sources: files, databases (D.B.), doc. XML, and No SQL D.B. The final output is presented in a "LOD Cloud". Logos for LIG, Trajectories, Université Grenoble Alpes, and OWL2/RDF are shown.

GeoJModelBuilder (LIESMARS)

The screenshot shows the GeoJModelBuilder (LIESMARS) software interface. It features a top-level window for defining a process flow with nodes like "GeoTurbidity", "GeoSlope", "GeoLandUse", "GeoVegetation", "GeoSoil", "GeoWater", "GeoAir", "GeoClimate", "GeoHealth", "GeoEconomic", "GeoSocial", "GeoCultural", "GeoHistorical", "GeoPolitical", "GeoReligious", "GeoLinguistic", "GeoArchaeological", "GeoAnthropological", "GeoBiological", "GeoChemical", "GeoPhysical", "GeoAstronomical", "GeoCosmological", "GeoMeteorological", "GeoOceanographic", "GeoClimatological", "GeoHydrological", "GeoSedimentological", "GeoGeological", "GeoPetrological", "GeoMineralogical", "GeoCosmochemical", "GeoGeochemical", "GeoBiogeochemical", "GeoEcological", "GeoPalaeontological", "GeoArchaeobotanical", "GeoArchaeozoological", "GeoArchaeological", "GeoArchaeological", "GeoArchaeological", "GeoArchaeological", "GeoArchaeological". Below this is a 3D visualization of a terrain model with various layers, and a bottom window showing a globe with a circular overlay. Logos for LIESMARS and Université Grenoble Alpes are visible.

The central image contains logos for Trajectories (Université Grenoble Alpes), LIG, LIESMARS (with Chinese text 北大基因 and BGI), and Université Grenoble Alpes. Below the logos is a large black stylized infinity symbol. At the bottom, there are symbols representing international collaboration: the French and Chinese flags, a globe, a rolled-up document, and a graduation cap.

Expected contributions

- Long-term partnership
- Multidisciplinary consortium between our two countries
- Franco-Chinese environmental data analysis and processing network