
ZATimeline: Visualizing SES trajectory data on a timeline

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Résumé

Spatio-temporal data of biodiversity, population or climate as well as socio-cultural milestones... are among the data collected by the French Long Term Socio-Ecological Research (LTSER) network, namely Réseau des Zones Ateliers (RZA), to capture biophysical and sociological processes occurring in the socio-ecosystems (SESs) under study.

Several conceptual frameworks were proposed to analyze external drivers and practices that impact and modify SES components such as stocks, processes, ecosystemic services or disservices. Among them, timelines are particular representation. As quoted in Sheps (wikipedia), the capital use of the Charts is an excellent mechanical help to the knowledge of history, impressing the imagination indelibly with a just image of the rise, progress, extent, duration, and contemporary state of all the considerable empires that have ever existed in the world.

Timelines are precious tools to:

- + report on data availability for the different proxies and their individual trend,
- + report on external events, or unusual facts,
- + facilitate the analysis of complex inter-relationships,
- + identify/justify data shortage,
- + invite researchers to fill the gaps.

The variety of data tells us about the scientific focus and expertise of the timeline producers. Voids in the chart could indicate a lack of interdisciplinarity.

Drawing remains painful. Very few software are proposed. Among them, Office Timeline pro builds on PowerPoint and formatted Excel spreadsheets. However, information that can be represented remains limited, notably in terms of interactions.

The ZATimeline software is a contribution to the analysis of SES trajectories based on data spreadsheets storing key elements of the SES history and time series availability. Data

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format is key point. ZATimeline builds on Excel/Libreoffice spreadsheets to facilitate data management. Then, a dedicated, free of use, Matlab interface builds charts from these formatted spreadsheets. Format définition and representation are an ongoing work to be carried out within the ATHN2 group.

"Easter island/Rapa Nui" SES is chosen as a case study. Firstly, data were collected in scientific reports for the period ranging from the Polynesian colonization to the European colonization (1200 - 1888) to figure out and analyze the so-called "collapse" hypothesis of "Easter Island". Secondly, data were collected in Spanish sources to document the historical period ranging from the Chilean annexation to date (1888 – 2020) in order to outline the environmental impacts of sheeps and tourists on "Isla de Pascua". Third, researches were conducted using "Rapa Nui" as a keyword to observe the contemporary phase and their re-appropriation of land and culture.

ZATimeline operated on Easter Island/Isla de Pascua/Rapa Nui clearly figures Human-Nature interactions and notably tipping points in Easter Island governance, cultural and cultural practices, populations (human, flora, fauna), climate and their interrelations. This software is currently used in 6 research projects carried out by 4 ZA.

Mots-Clés: Trajectoire, ZATimeline, Données, Logiciels