Sharing and Analyzing Remote Sensing Observation Data for Linked Science

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Motivation

Research Problems:

- How to interconnect scientific assets?
  - How to describe scientific data and how to interconnect them with methods?
  - How to make research more transparent and reproducible?

- How to share remote sensing observation data?
  - How to analyze this Linked Spatio-Temporal Data and plot it on maps in novel ways to make a breakthrough?
  - How to aggregate, link and share data from ecological, social and economical dimensions?
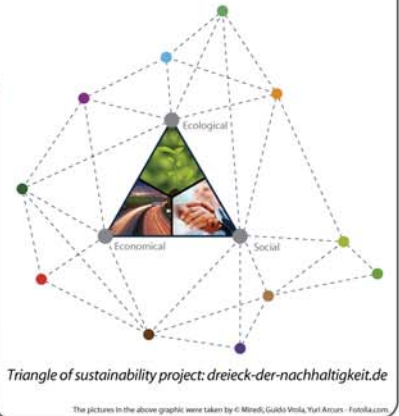
Linked Science Approach

Opening and Linking Science

- In order to make research settings transparent and reproducible there is a need for publishing both data and methods underlying research.
- Opening up and interconnecting scientific assets is a contribution towards Linked Science.
- In Linked Science publications, scientific data, methods, tools and other scientific assets are interconnected and shared online.

Data sources:
- Research database
- Buildings database
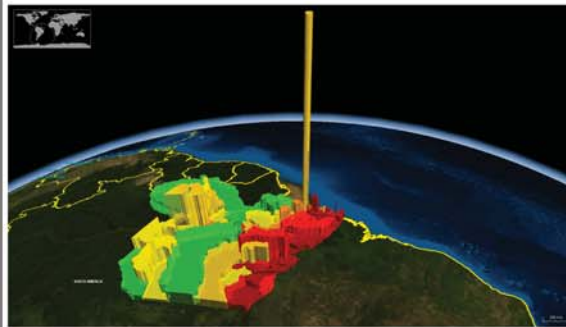- Course listings
- Library collection
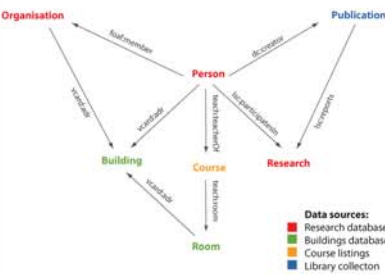
Integration of Economical, Ecological and Social Dimensions with Technical Sensor Observations

- We show how large amounts of remote sensing observation data about the Brazilian Amazon Rainforest can be published as Linked Spatio-Temporal Data.
- Remote sensing satelite data has been linked with ecological, social, and economical dimensions by using spatio-temporal reference as an integration enabler.
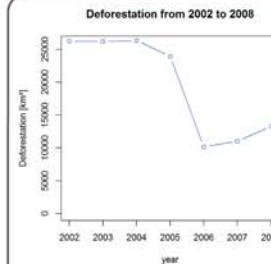

Triangle of sustainability project: dreieck-der-nachhaltigkeit.de

The pictures in the above graphic were taken by © Miredi, Guido Vrola, Yuri Arcurs - Fotolia.com

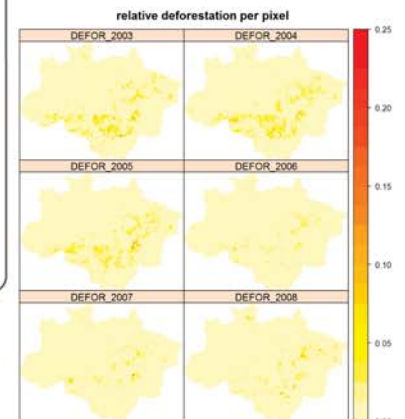### Communicating Linked Spatio-Temporal Data

Population of states visualized as the height of pillars together with colors indicating the deforestation rates.

- Linked Brazilian Amazon Rainforest Data allows for novel communication of science.
- Supports understanding of the linkage between very heterogeneous phenomena and to observe change in deforestation.

Showing what Linked Science means in practice:

LinkedScience.org

- Linked Science is an approach to interconnect scientific assets to enable transparent, reproducible and transdisciplinary research.
- *LinkedScience.org* is a community driven-effort to show what this means in practice.

Access and Analysis of Data

relative deforestation per pixel

Deforestation from 2002 to 2008

- Linked Spatio-Temporal Data can be easily accessed and analyzed.
- The statistical programming language and computing environment R connects to Linked Data with the openly available SPARQL package.