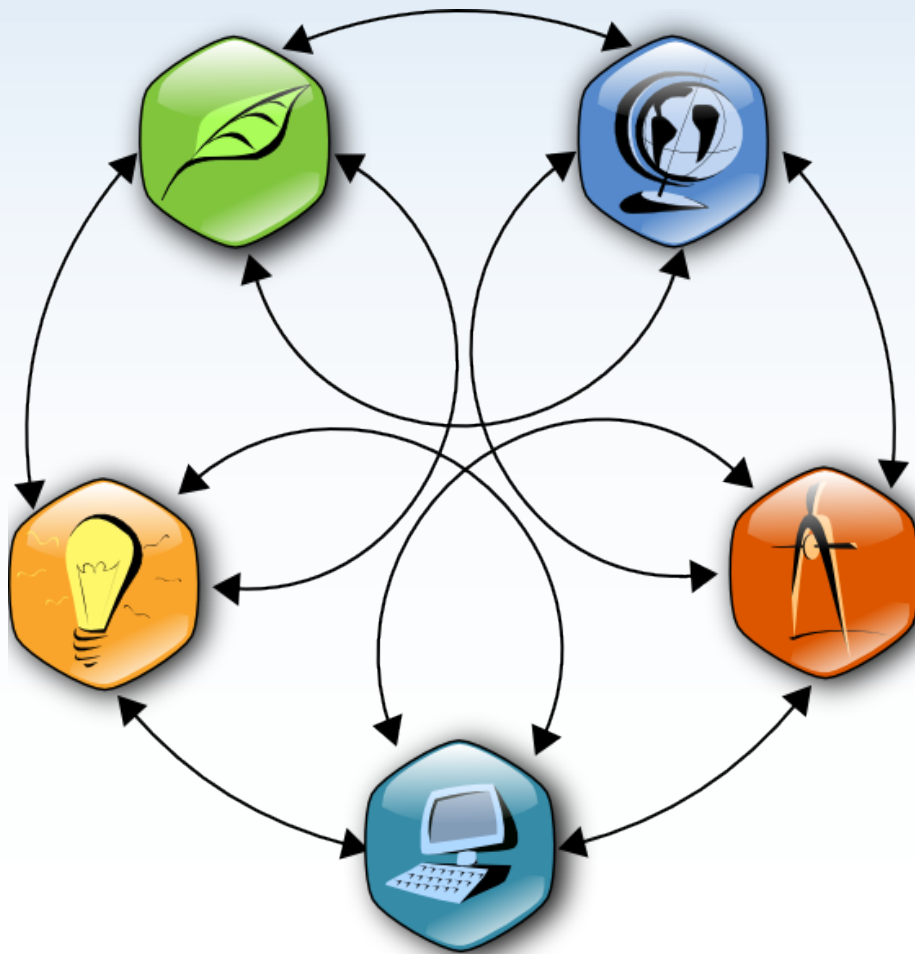
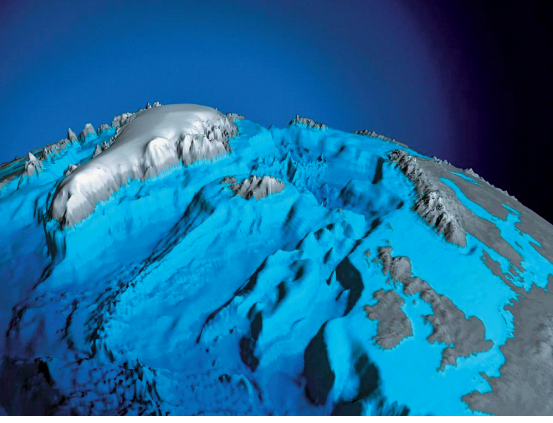


FIS

Remote Sensing In Schools





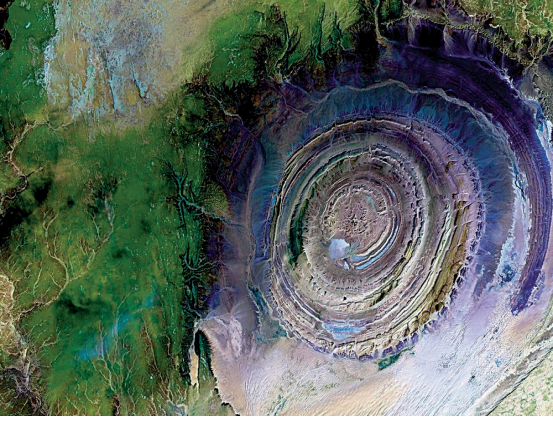
REMOTE SENSING IN SCHOOL LESSONS

FIS is a German acronym for “Remote Sensing in Schools”. The project aims at a more intensive use of remote sensing in school lessons. We consider this important because not only is remote sensing of growing relevance in the modern information society, but it also offers a range of possibilities to get pupils interested in natural sciences or engineering by employing fascinating satellite images and modern technology.

The project is carried out by the Geographic Institute of Bonn University (Germany) together with partners from secondary schools. FIS is funded by the German Aerospace Centre (DLR) and the German Federal Ministry for Economics and Technology (BMWi).

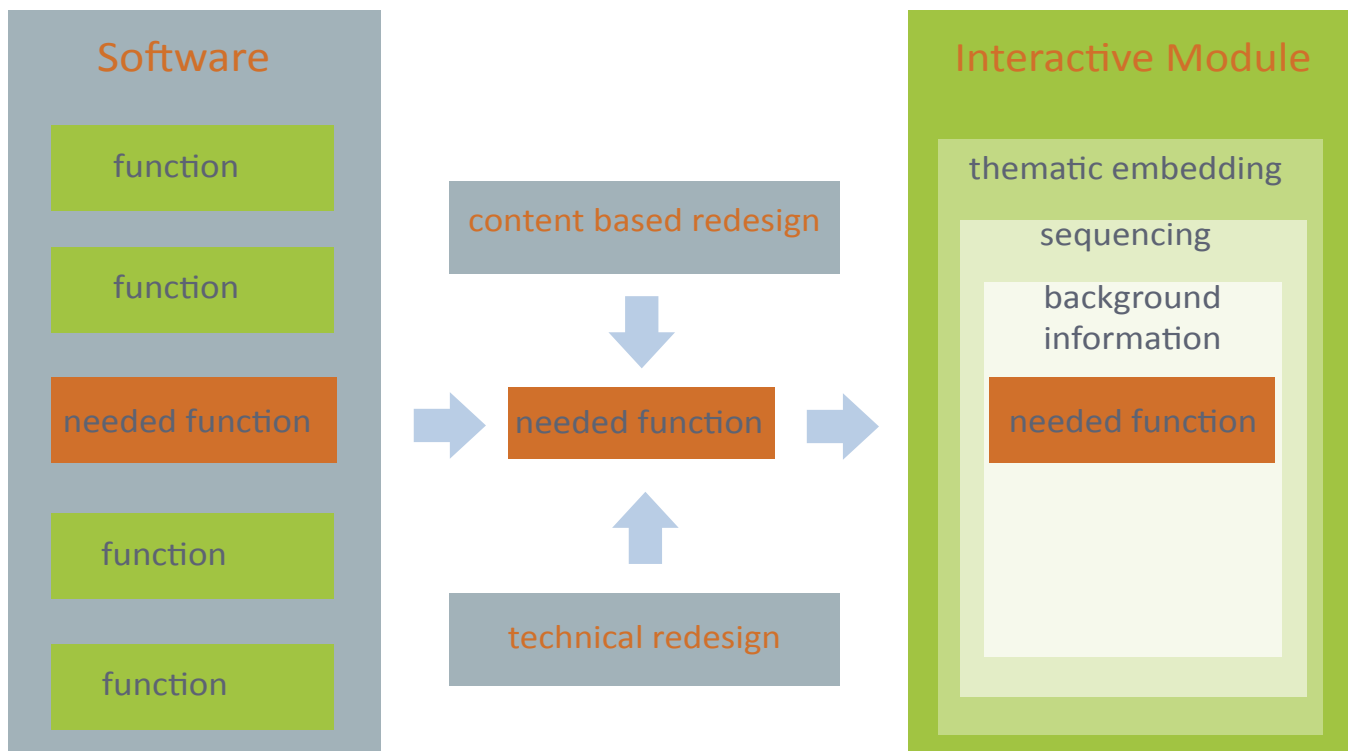
Existing results show that many teachers are interested in remote sensing and, at same time, motivated to integrate it into their teaching. Despite the good intention, in the end, the implementation often fails due to the complexity and poor set-up of the information provided. Therefore, the FIS-Project developed a new didactical concept, which bases upon the principles of *intermediality*, *interactivity* and *interdisciplinarity*.

Especially the preparation and implementation of digital learning materials takes the center stage of FIS. These interactive materials consist of tools for image analysis embedded in tasks, background information and explanatory animations. They aim at an independent disclosing and solving of problems.

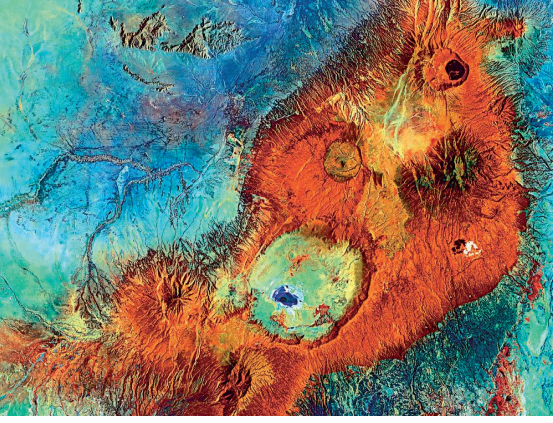


REMOTE SENSING AND DIGITAL LEARNING

Today, none of the existing remote sensing software solutions allows a straightforward use of digital satellite images in schools. To be nonetheless able to work with this kind of material, interactive lessons are created and evaluated in the course of FIS. Those learning modules allow the implementation of functionalities, which are derived from remote sensing software, but are redesigned to reduce the complexity for the specific use in the lesson.



Using digital interactive learning modules we can integrate a wide range of remote sensing techniques in regular lessons in a sustainable manner. Working directives and background information form a structure in which the needed image analysis function is embedded. This way the modules can be used *without* instruction in a lesson that is based mainly on self reliant learning and is lead only to a low extend by the teacher.



NATURAL SCIENTIFIC KNOWLEDGE TRANSFER

Cross-linked thinking is one of the underlying principles of the learning applications produced in the project. Consequently the subject matter will be discussed in different classes. The basic principles of remote sensing are covered in the natural sciences like math, physics or computer science, while in the more applied sciences, like geography or biology, satellite data is analyzed to answer a certain research question.



Physics

- sensor technology
- optics
- radiance characteristics
- ...



Math

- statistics
- projections
- transformations
- ...



Geography

- global change
- urbanization
- ecological disasters
- ...



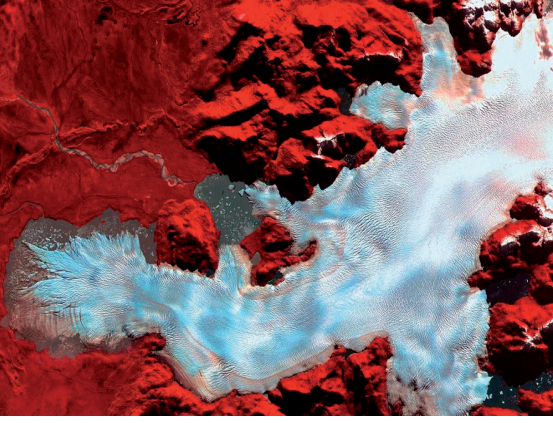
Informatics

- databases
- data types
- import/ export of data
- ...



Biology

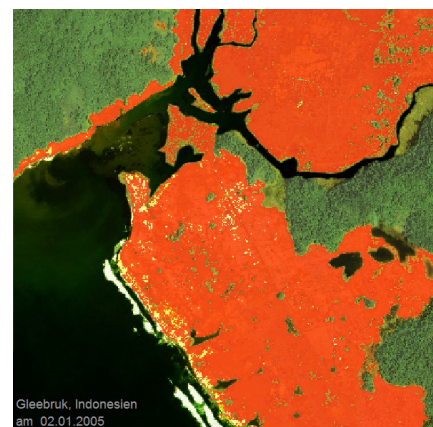
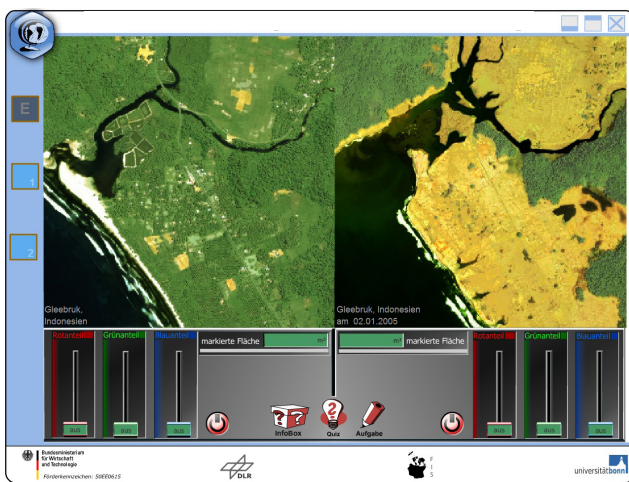
- biodiversity
- ecosystems
- landscape change
- ...



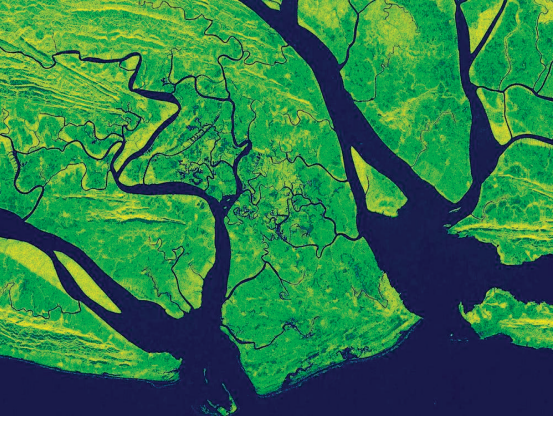
TEACHING MATERIALS ONLINE

The digital learning materials developed in the FIS-Project are compatible with Windows as well as other OS via the Flash plug-in and can be started without the need of installation. They are downloadable in English language at the web site of the FIS-Project ([direct link](#) or www.geographie.uni-bonn.de/fis). In the future they will be integrated in the forthcoming learning portal.

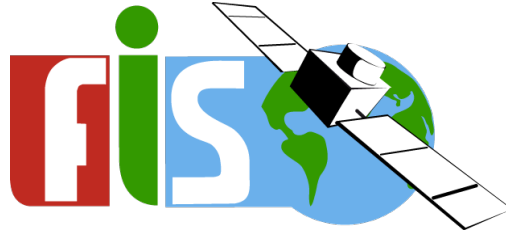
An example for our digital learning materials is the teaching unit “Tsunami” as a part of the subject field “endangerment of habitats” in grade 7. After they got background information, the students are asked to visually compare two overlying satellite images taken before and after the tsunami 2004 in South-East Asia with the help of an interactive controller. The pupils are invited to put themselves in the position of a resident and consider possible consequences of the destructions.



Besides, there is information provided in an info box clearly explaining the procedure of change detection in a short film. In the last part of the module, after the students have understood the principles of change detection, they compare another before and after image using a tool to select different ranges of color values and thereby extracting information about the extend of the destruction directly from the digital image data.



REMOTE SENSING IN SCHOOL LESSONS



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