

Teaching materials about

# Reflection in focus- Earth observation by radar satellites

Grades 7 - 9

material für students

## Aufgaben

### Preparatory task 1

Open the specified learning unit "Reflection in focus - Earth observation by radar satellites" (<https://fis.rub.de/lerneinheit/reflection-from-satellite>). Then click on "Show map". A map will then open. You can then display the satellite image by clicking on "Palamas Sentinel-1"; you can use the eye symbol to show and hide the satellite image. We are now on the Greek mainland. With the pipette you have the possibility to read out individual pixel values and thus to see if pixels have the same, lower or higher values.

### Task 2

Watch the educational video carefully and make notes on the different reflective properties.

- a) Then determine the surfaces with purely specular reflective properties.
- b) Now explain which surface these surfaces could be.

### Task 3

In Table 1 you can see photos showing three different surfaces. Think about what the pixel of a radar image that covers this surface looks like.

- a) Color it in the grayscale you have considered.
- b) Justify your assumption.

surface	pixel	reason
		
		



**table 1: Different surfaces. Building - forest - water surface.**

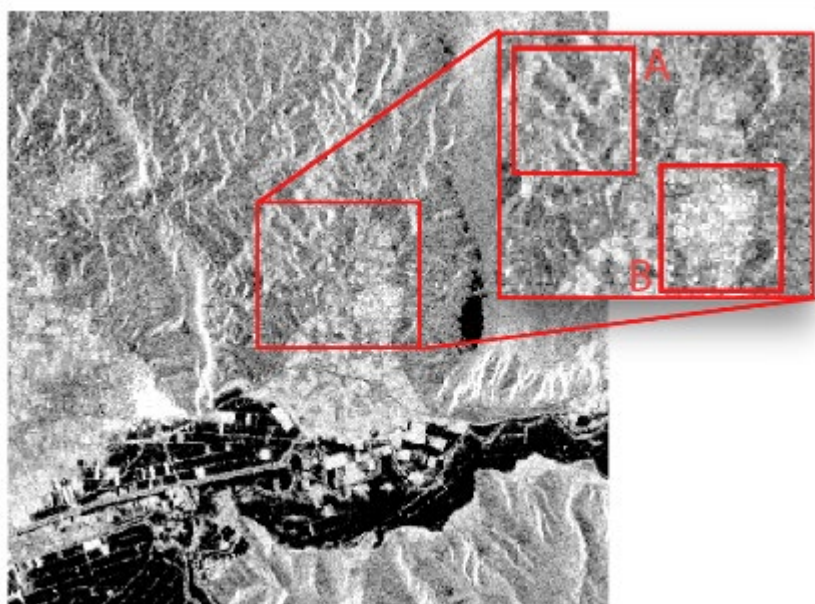
#### Task 4

Find the section of the radar image shown in Figure 1 on your screen.

The marked conspicuously bright areas A and B in the section of the radar image have different causes.

Think about what these could be and justify your assumptions.

Tip: Hide the satellite image so that you can recognize indications of the conditions with the help of the map



**figure 1: Detail of radar image (Sentinel-1).**

#### Task 5

Radar satellites serve as a great support for earth observation in many areas of life.

- a) First, work individually to come up with ideas: For which other areas of life can radar satellites serve as support and what precise information about observing the Earth could they provide? Start by thinking independently. You can then research further information on the Internet.
- b) Now sit down with your working group and exchange ideas with the others. Bring your ideas together and save them in the form of a mind map. You can also refer back to your results from tasks 1-4.