

We now all have the capability to process digital information from direct MODIS satellite broadcast in near-real time. Today's assignment tasks you to provide the general public with detailed and accurate information on a topic on the cover of almost every newspaper.



Peter Vancoillie, published April-19, 2010 at <http://news.nationalgeographic.com/news/2010/04/photogalleries/>

Stratovolcano Eyjafjallajökull erupted in southern Iceland at 63.63N latitude and 19.62W longitude with an elevation of about 1666m. It last erupted in 1823. The current eruption began March-21, 2010 and closed most European air space by April-16. First reports on a possible eruption surfaced March-3, 2010. The Background details and sources this event.

### TASKS

1. Identify and list potentially useful images during the period March 10-24 (group-1), March 25 through April-6 (group-2), and April 7-20 (group-3).
2. Download, process, and post on the web at least 1 image for each week, that is 2 images for each group. The image shall be on a labeled latitude/longitude grid using your own processing.
3. Are there any differences between band-1 at 645nm and band-2 at 865 nm?

Groups are Claire and Pat, Weihan and Xiangbai, as well as Feili and Zhaoyun. Please focus on an area within ~100-km of the eruption. The following questions shall guide your work:

Are there partly clear images available for this event? Can you detect features in imagery that document impacts on the oceans? Have these features changed prior and during the ongoing event? If so, how? How does the eruption impact the atmosphere at local scales in the imagery? We know what it does at the regional scales, i.e., closing European air traffic.

## Background Project-1: Icelandic Volcano Eruptions 2010

First activity reports occurred on the web the first week in March, e.g., Dr. Erik Klemetti, an Assistant Professor at Denison University, Ohio wrote on March-4, 2010 that

“... Taken together, it looks like Eyjafjallajökull is a prime candidate for the next eruption on Iceland. Eyjafjallajökull (also known as merely Eyjafjöll) is one of a series of volcano systems on the south side of Iceland, near Katla. Amongst the Icelandic volcanoes, it has been relatively quiet, with the last known eruption occurring from 1821 until 1823, with evidence for eruptions in 1612 and 550 AD. The last two eruptions have been VEI 2, with explosive characteristics - and with a volcano under a glacier, we always have the threat of jökulhlaup - glacial outburst flows triggered by the volcanic eruption ...” [http://scienceblogs.com/eruptions/2010/03/increasing\_signs\_of\_activity\_a.php]

while the Institute of Earth Science at the University of Iceland reports

“... An eruption began in South Iceland in late evening of 20 March 2010 at the Eyjafjallajökull volcanic system ... The initial visual report of the eruption was at 23:52 GMT, when a red cloud was observed at the volcano, lightening up the sky above the eruptive site. The eruption was preceded with intense seismicity and high rates of deformation in the weeks before the eruption, in association with magma recharging of the volcano. Immediately prior to the eruption the depth of seismicity had become shallow, but was not significantly enhanced from what it had been in the previous weeks. Deformation was occurring at rates of up to a centimetre a day since March 4 at continuous GPS sites installed within 12 km from the eruptive site.

The eruption broke out with fire fountains and Hawaiian eruptive style on about 500 m long NE-SW oriented eruptive fissure at N63°38.1 W19°26.4 on the northeast shoulder of the volcano at an elevation of about 1000 m. It was observed from air from 4-7 A.M. on March 21. Lava flows short distance from the eruptive site, and minor eruption plume at elevation less than 1 km was deflected by wind to the west. Volcanic explosive index (VEI) is 1 or less. Tephra fall is minor or insignificant. The eruption occurs just outside the ice cap of Eyjafjallajökull, and no ice melting is occurring at present.

Satellite data is being used to study the eruption and associated intrusion. Several MODIS thermal images on 21 March show a temperature anomaly where the eruption is occurring ... “ [http://www2.norvol.hi.is/page/ies\_activity\_Eyjafjallajökull]

And on April-15, 2010 the BBC reported

All flights in and out of the UK and several other European countries have been suspended as ash from a volcanic eruption in Iceland moves south. Up to 4,000 flights are being cancelled with airspace closed in Norway, Sweden, Finland and Denmark among others ...” [http://news.bbc.co.uk/2/hi/uk\_news/8621407.stm]