

Salt Lake Calibration Test Site Template
for information regarding the prime CEOS WGCV Cal/Val site for the post launch
characterization and calibration of optical sensor

Site Name

Salt Lake (Tuz Gölü)

Location

In the arid central plateau of Turkey, about 65 miles (105 km) northeast of Konya, neighboring also Niğde, Aksaray and Ankara provinces. About 150 km to Ankara, the capital, can be accessed with about 2 hours of driving.

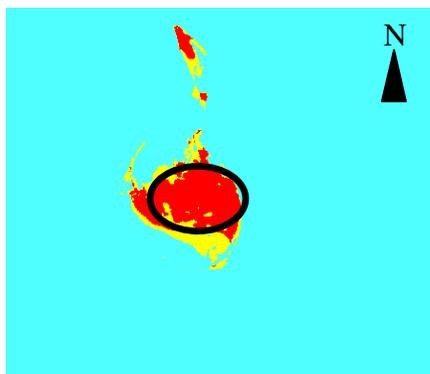
Altitude above sea level (meters)

905m

Centre Latitude/Longitude (Degrees)

38 50⁰ N, 33 20⁰ E

Size/Shape of Usable Area (meters)



Usable area obtained by analyzing the 2004-2006 Modis July/August data.

Red region is 324.026 km² and shows available homogenous area throughout July/August.

Yellow region has an area of 195.092 km² and shows possible usable area July/August.

Figure 1. Shape of usable area

Usable area is in an ellipse shape with 16.96 km minor axis and 27.99 km major axis.

Description of the site

- Lake Tuz is a permanent endorheic lake, which lies in the Tuz gölü basin in Central Anatolia.
- The site is a **salt flat**. The evaporates are mainly halite and gypsum, with minor amounts of polyhalite and coelestine.
- **No vegetation** in the salt flat. But arable fields and salt-steppes surround the lake.
- Salt mines and saltwork pools operating in the lake.

Picture/s including surroundings

Google



Figure 2. Tuz Gölü image from Google

Digital Topographic data screenshots (SRTM/GTOPO30)

SRTM, NASA

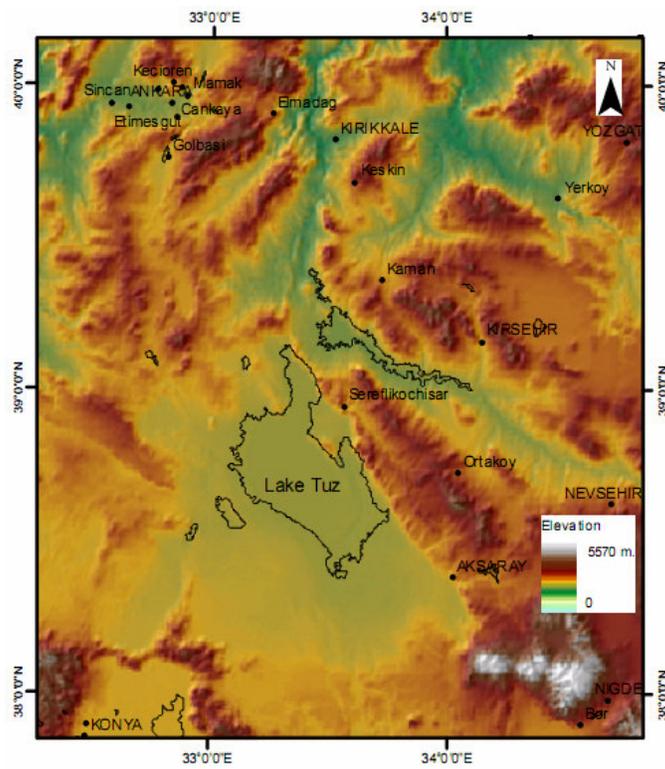


Figure 3. SRTM DEM of the region

Moderate and High resolution data screenshots



Figure 4. SPOT quick look image Spot 5, 28.11.2006, Sirius Catalogue

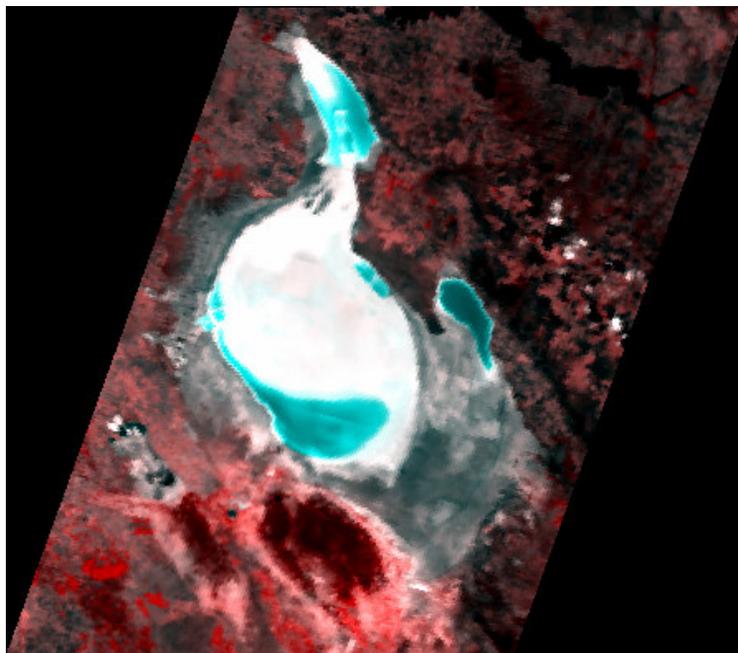


Figure 5. Modis 10.07.2006 RGB: 2, 1, 1; Total area: 950.797 Km²

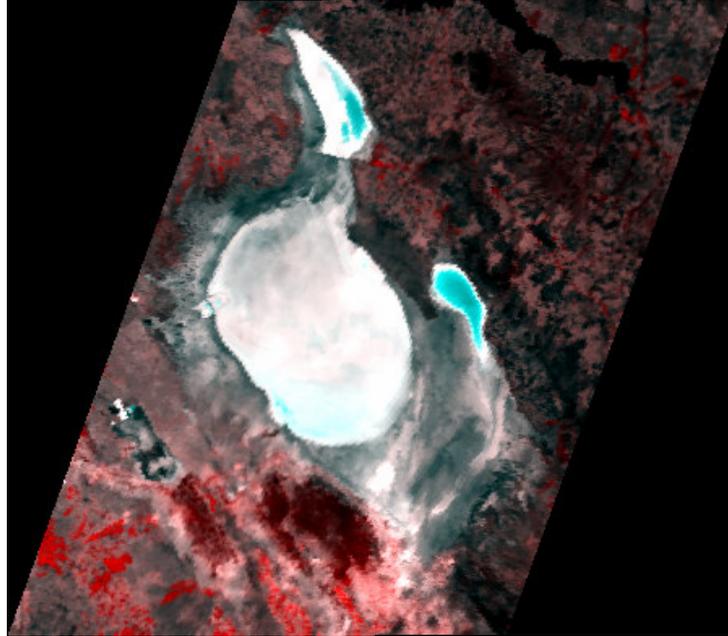


Figure 6. Modis 10.08.2005 RGB: 2, 1, 1; Total area: 856.093 Km²

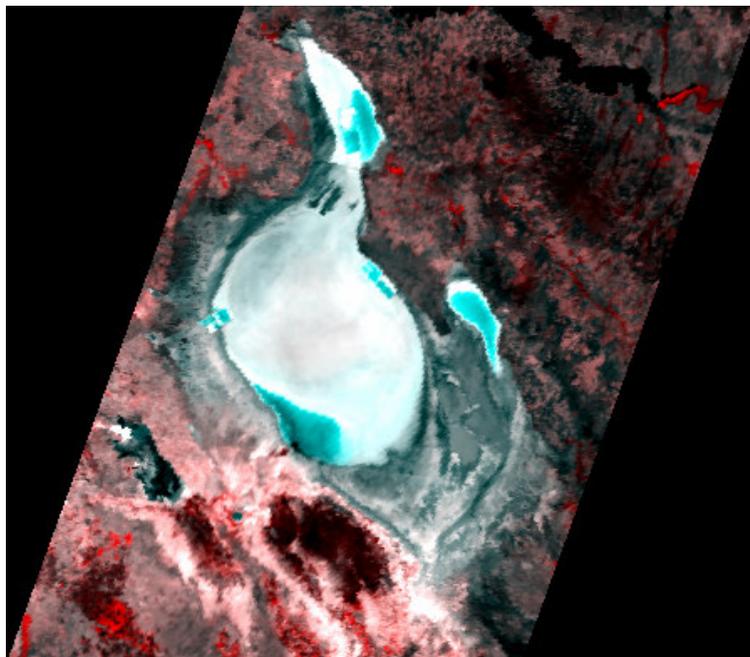


Figure7. Modis 10.07.2004 RGB: 2, 1, 1; Total area: 887.984 Km²



Figure 8. ENVISAT, Meris 03.06.2007



Figure 9. LANDSAT ETM+ 01.08.2001

Current Status of the site

Instrumented:

First instrumentation realized by Turkish State Meteorological Service. In a nationally funded project, further instrumentation is planned. Site will be temporarily instrumented during campaign.

Source of funding for maintenance: The Scientific and Technological Research Council of Turkey

Open access (to other teams): The site is open to access with TUBITAK UZAY researchers' attendance.

Surface Measurements

Meteorological instrumentation (list):

The instrumentation to be installed to the site includes:

- Wireless Vantage Pro2 Plus Weather Station including rain collector, anemometer, and temperature, humidity, solar radiation and UV sensors.
- Pyranometer

Historical record of site from (year): Meteorological data is available since 1987. Data was obtained from different meteorological stations. These stations are shown at figure 10. During field campaign, we will also use portable meteorological station for more accurate analysis.

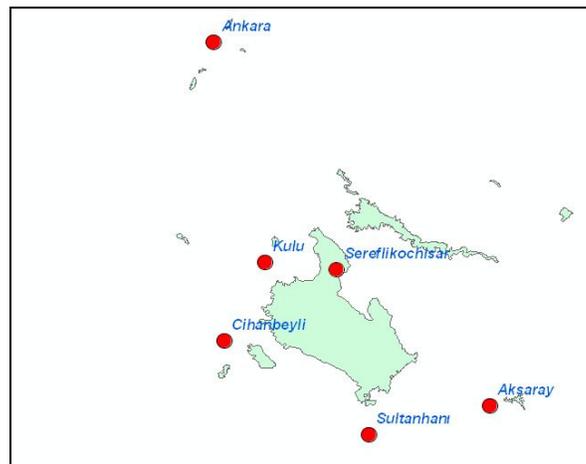


Figure 10. Meteorological stations around Tuz Gölü
(Scale: 1:900.000)

Average number of clear skies: Following graphics show the monthly average rainfall and insolation measured by Cihanbeyli and Kulu meteorological stations from 2004 to 2006 (averaged).

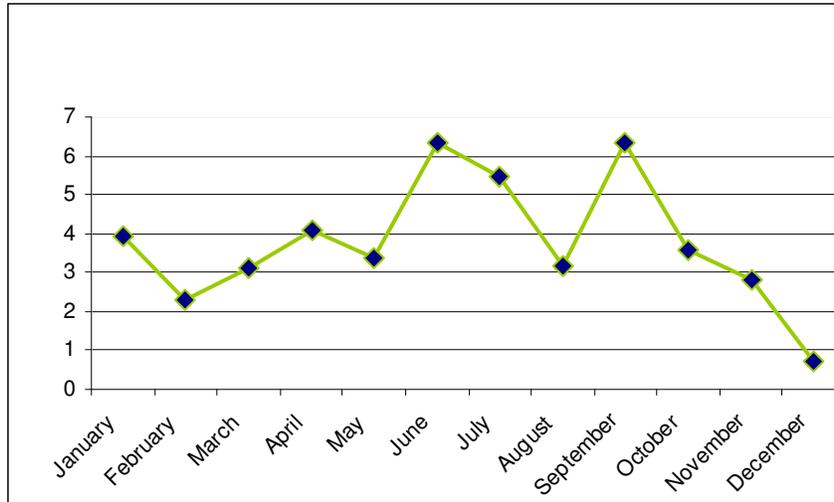


Figure 11. Average Monthly Rainfall (mm) from 2004 to 2006

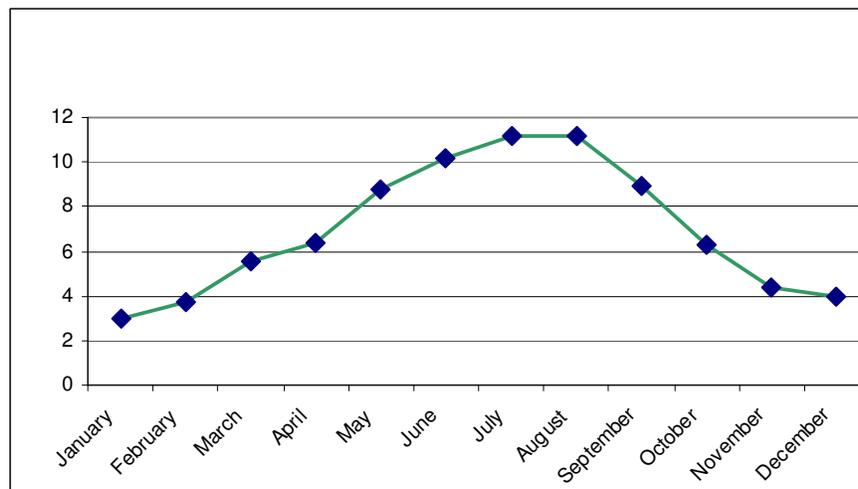


Figure 12. Average Monthly Insolation Time (in 24 hours) from 2004 to 2006

Seasonal variation: According to the meteorological data of Turkish State Meteorological Service from 2000 to 2006, seasonal variation is medium in one year period but it is low in July and August.

Surface Characteristics - Surface Measurements

Since the field doesn't have appropriate historic data and field measurements, some questions are left unanswered. In 2007 a preliminary field study and in 2008 a detailed field study will be implemented and necessary data will be provided.

Surface reflectance – variability across site (uniformity) (%)

MODIS data is used for the spatial analysis in ENVI software environment. Getis Ord Gi Index and Local Moran's I index results are as follows:

According to the Getis-Ord Gi Index:

In remote sensing context, if the target pixel and its surrounding have similar high values G statistics give high value. If the target pixel and its surrounding have similar low values G statistics give low value.

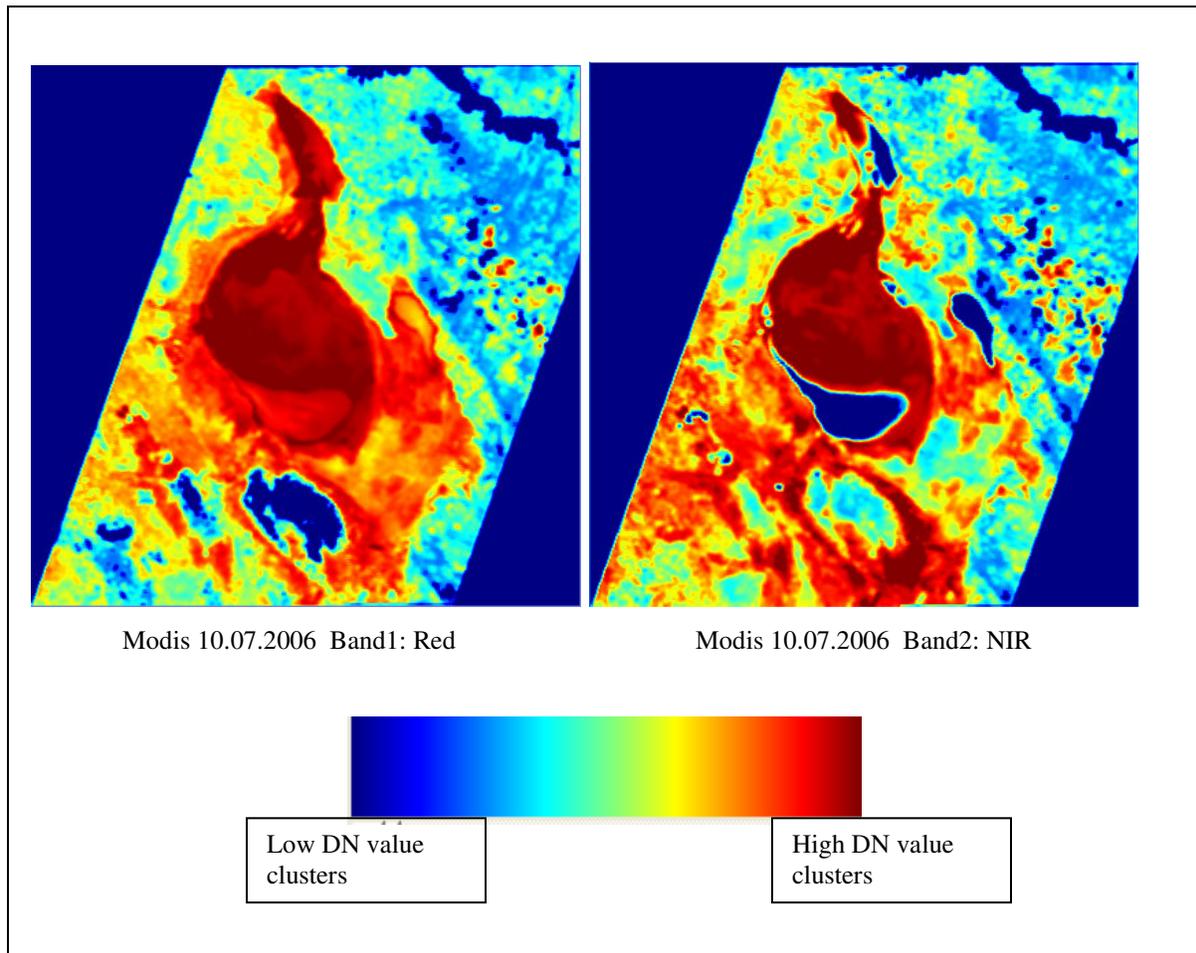
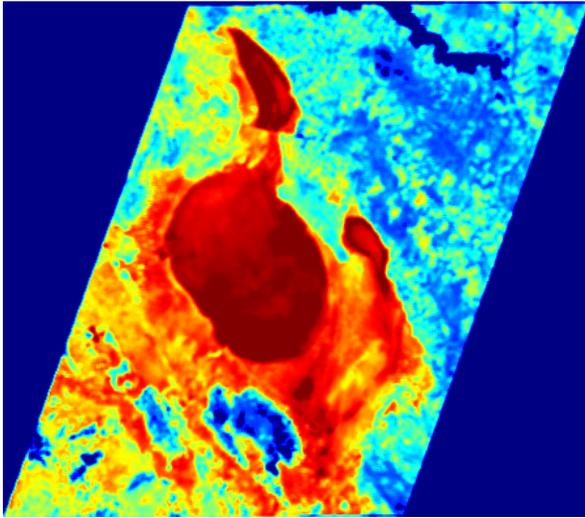
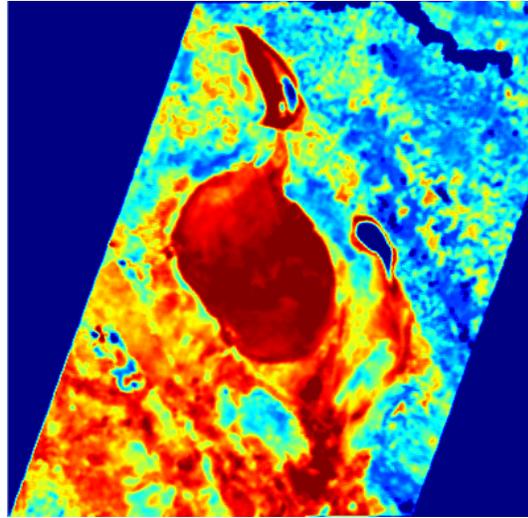


Figure 13. Getis-Ord Gi Index of 10.07.2006 MODIS data



Modis 10.08.2005 Band1: Red

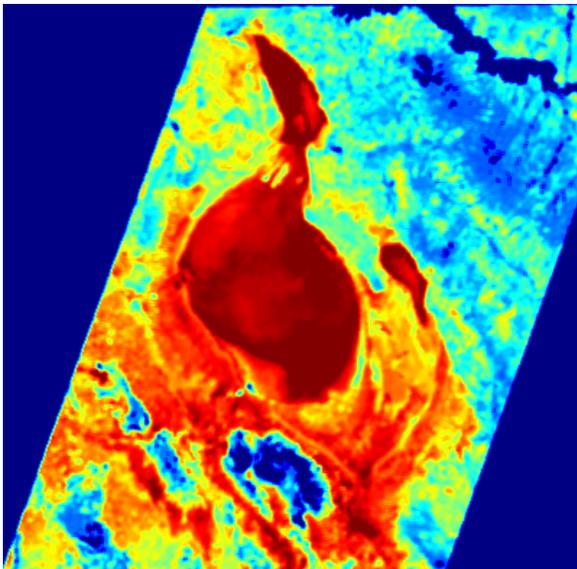


Modis 10.08.2005 Band2: NIR

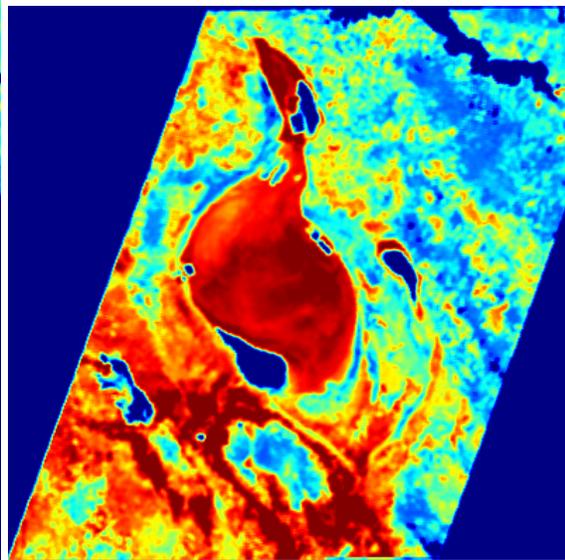


Low DN value
clusters

High DN value
clusters



Modis 10.07.2004 Band1: Red



Modis 10.07.2004 Band2: NIR

Figure 14. Getis-Ord Gi Index of 10.08.2005 and 10.07.2004 MODIS data

According to the Local Moran's I index:

It identifies pixel clustering. Positive values indicate a cluster of similar values, while negative values imply no clustering.

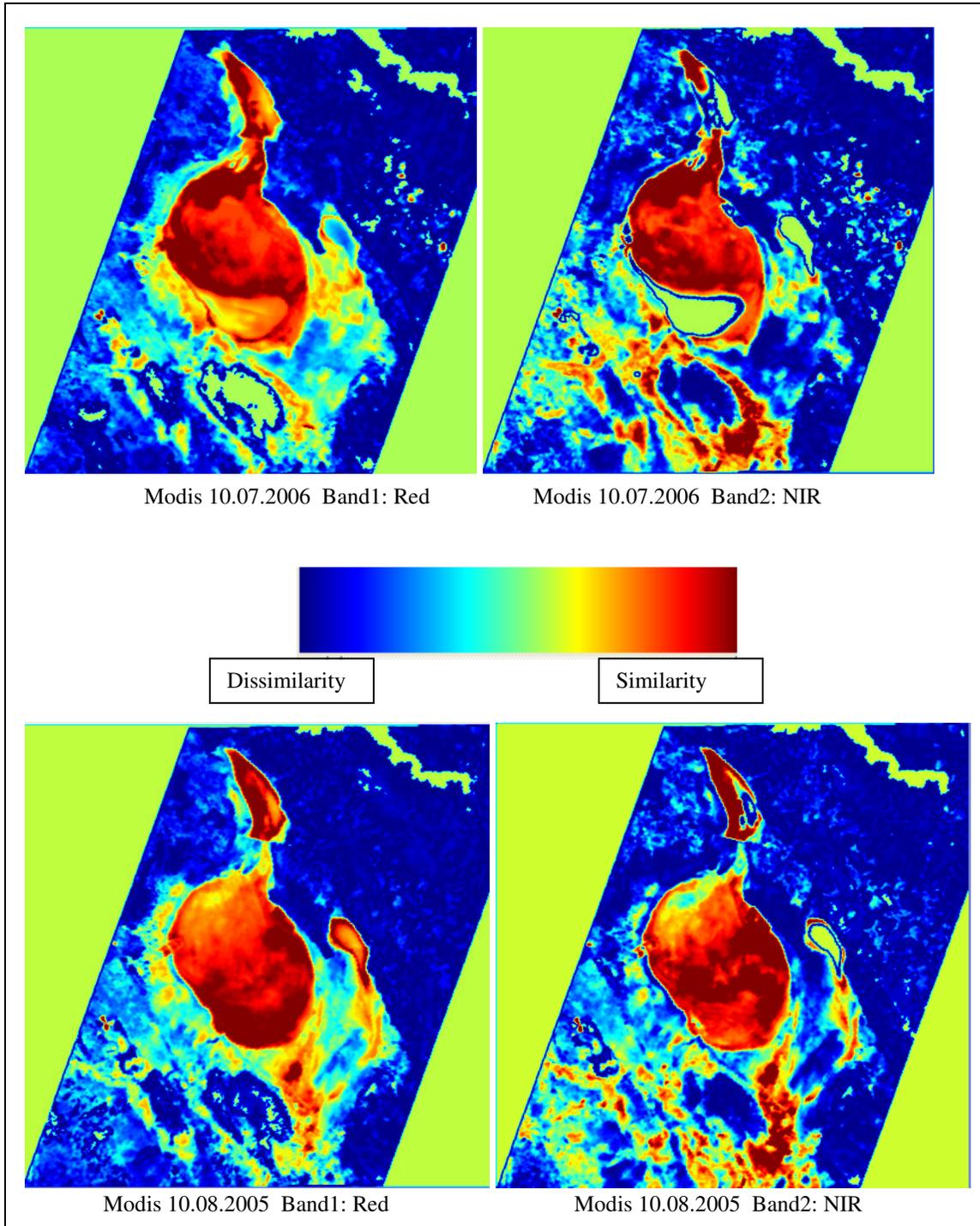


Figure 15. Local Moran's I Index of 10.07.2006 and 10.08.2005 MODIS data

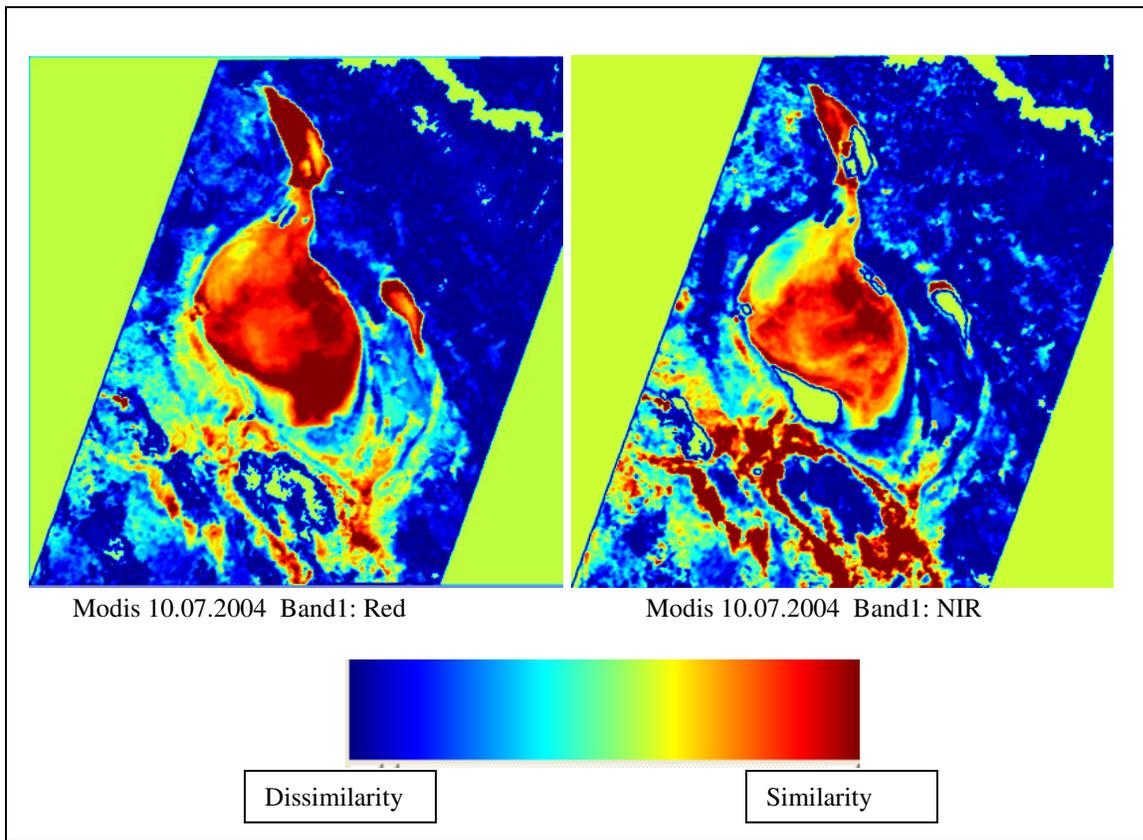


Figure 16. Local Moran's I Index of 10.07.2004 MODIS data

Long term surface slope:

The lake surface is flat with no slope.

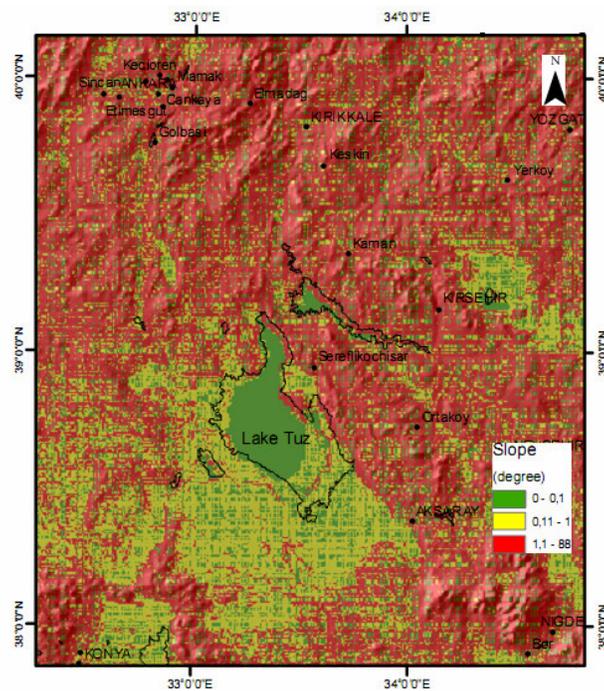


Figure 17. Surface slope map of Salt Lake

Site useage

The site has not been used yet.

Auxiliary data

Landsat WRS2 Path/Row

WRS_PATH = 177 / WRS_ROW = 033

o NW Corner Latitude/Longitude (Degrees)
+39.8600129 / +31.9861233

o NE Corner Latitude/Longitude (Degrees)
+39.5519391 / +34.0914035

o SW Corner Latitude/Longitude (Degrees)
+38.2463235 / +31.5152018

o SE Corner Latitude/Longitude (Degrees)
+37.9476184 / +33.5748457