LANDSAT TM ΣΥΝΔΥΑΣΜΟΣ ΚΑΝΑΛΙΩΝ

Land Cover Type	Spectral Band Combination
Water	Band 1, 4 & 7 / Band 1, 2 & 3
Urban	Band 1,4 & 7
Farmland	Band 1, 2 & 3
Forest	Band 1, 4 & 7
Salt Scald	Band 1, 2 & 3
Remnant Vegetation	Band 1, 4 & 7
Irrigated Vegetation	Band 1, 4 & 7

SENTINEL-2 ΣΥΝΔΥΑΣΜΟΣ ΚΑΝΑΛΙΩΝ

Band combinations for Sentinel-2. They can be found in SNAP menu, the RGB composite is as follows:

Natural Colors: 4 3 2
False color Infrared: 8 4 3
False color Urban: 12 11 4
Agriculture: 11 8 2
Atmospheric penetration: 12 11 8a
Healthy vegetation: 8 11 2
Land/Water: 8 11 4
Natural Colors with Atmospheric Removal: 12 8 3
Shortwave Infrared: 12 8 4
Vegetation Analysis: 11 8 4

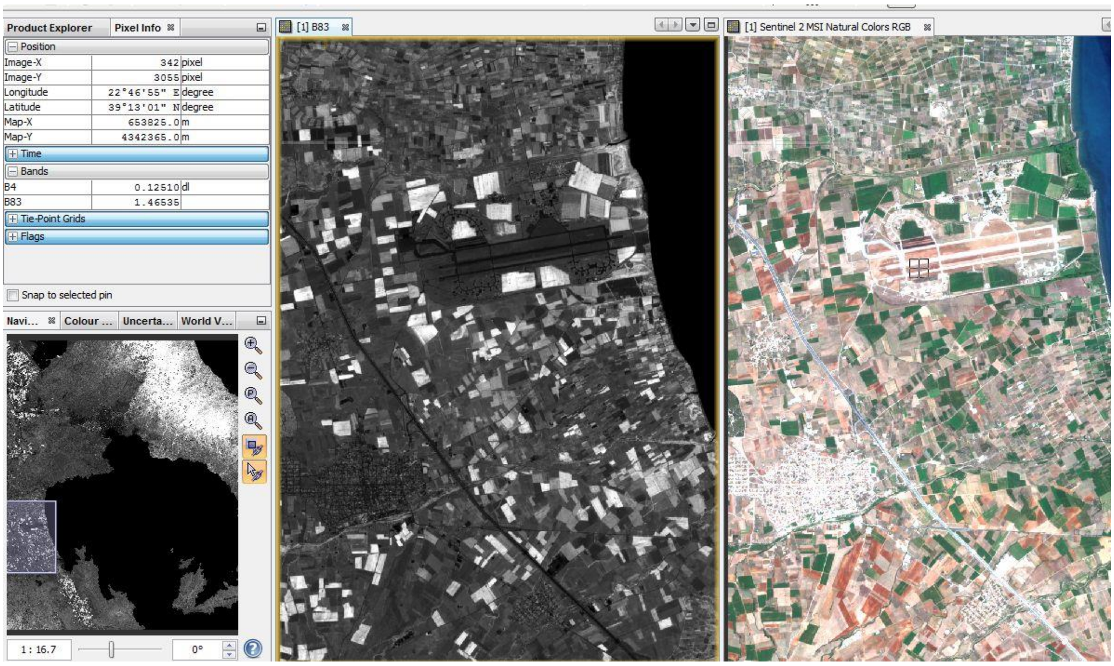
SENTINEL-2: ΠΡΑΞΕΙΣ ΚΑΝΑΛΙΩΝ

ΛΙΣΤΑ ΜΕ ΔΕΙΚΤΕΣ: https://www.indexdatabase.de/db/i.php?offset=2

- **Band 8/Band 3 Ratio For Senescing Vegetation**

This process eliminates highly reflective senescing vegetation using filtering tests on band 8/band 3 reflectance ratio. This test is based on the fact that senescing vegetation is highly reflective in NIR and more highly reflective in the green than green vegetation due to chlorophyll loss. The band 8/band 3 reflectance ratio is higher for vegetation than for cloud or other scene features.

- ✓ Υπολογίστε τον Δείκτη με Band Maths
- ✓ Δημιουργείστε RGB color composite και συγκρίνεται με τον δείκτη.
- ✓ Δημιουργία Μάσκας
- ✓ Στατιστικά στοιχεία



- **ΔΕΙΚΤΗΣ NDVI**

$$\text{Normalized Difference Vegetation Index (NDVI)} = \frac{NIR - VIR}{NIR + VIR}$$

Equation 2: NDVI Ratio

The NDVI ratio can be determined from the contribution of visible wavelength and near-infra-red wavelengths. Strong and well-nourished vegetation will absorb most of the visible wavelengths that it receives and will reflect back a large proportion of the near-infra-red light, whereas poor condition vegetation or thin areas, will reflect more visible wavelength light and less near-infra-red light.

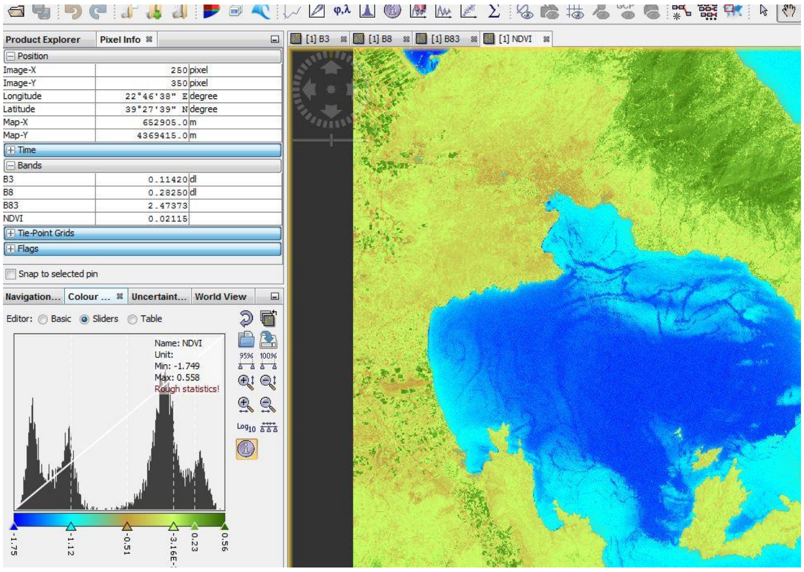
The NDVI ratio for SENTINEL-2 is outlined in Equation 2a:

$$\text{Normalized Difference Vegetation Index (NDVI)} = \frac{\text{Band 8} - \text{Band 4}}{\text{Band 8} + \text{Band 4}}$$

✓ Υπολογίστε τον Δείκτη με Band Maths.

✓ Δημιουργείστε μια χρωματική παλέτα.

- ✓ Εισάγετε την παλέτα “Meris_veg_index”.
- ✓ Δημιουργία Μάσκας.
- ✓ Στατιστικά στοιχεία



LANDSAT TM ΠΡΑΞΕΙΣ ΚΑΝΑΛΙΩΝ

TM3/TM4: This ratio has defined barren lands and urban area uniquely. But it could not define water body, forests and croplands.

TM4/TM3: This ratio distinguished vegetation, water and croplands. It has enhanced forests, barren lands. Because forests or vegetation exhibits higher reflectance in near IR region (0.76 -0.90u m) and strong absorption in red region (0.63-0.69u m) region. This ratio uniquely defines the distribution of vegetation. The lighter the tone, the greater the amount of vegetation present.

TM5/TM7: This ratio separated land and water uniquely. Since soils exhibit strong absorption in the band 7 (2.08 -2.35u m) and high reflectance in band 5 (1.55 - 1.75u m), soil has been enhanced in this ratio. Land has appeared as lighter tone and water appeared as dark tone.

TM2/TM3: this ratio has distinguished croplands, barren lands sharply. But it hasn’t separated croplands, forests and water body. Both forests and water body has appeared as lighter tone and barren land appeared has dark tone. It did not enhance urban area. Chlorophyll has strong reflectance in the band 2 (0.52 -0.60u m) region and strong absorption in the band 3(0.63 -0.69u m) region, vegetation has appeared as higher tone.

TM3/TM2: This ratio has separated forests and croplands. Because band 3 (0.63-0.69m m) is the red chlorophyll absorption band of healthy green vegetation and band 2 (0.52-0.69m m) is the reflectance band from leaf surfaces. This ratio can be useful to discriminate broad classes of vegetation. Croplands have appeared as lighter (brighter) tone and forests appeared as dark tone.

TM4/TM5: It enhances the water body, vegetation and presence of moisture content in the croplands. Water body has appeared as dark tone and vegetation as lighter tone. Because water is a strong absorber in near IR region (band4) and higher reflectance in band 5 region. It can be useful for discriminating water bodies from land.

TM5/TM4: It has separated water body from forest, barren lands and vegetation. In this ratio water has appeared as dark tone and forest, barren lands, bare croplands all have exhibited brighter tone.

TM5/TM7: It has separated water body from lands (soils). It has also enhanced presence of moisture in croplands. All water bodies appeared as dark tone. Both band 5 and band 7 are sensitive to moisture content variation in soils and vegetation. This ratio is useful for crop-drought studies and plant vigor investigations.

TM3/TM5: This ratio enhances barren lands, highways, street patterns within the urban areas and urban built-up or cemented areas. It could not enhance the clear water but it enhanced turbid water. This ratio is useful for observing differences in water turbidity. Barren lands, highways, urban and built-up areas have appeared as lighter tone and forests, water body and croplands appeared as dark tone.

TM7/TM2: This ratio has separated forests and croplands. But it could not separated forests from water body; both features have appeared as dark tone. It enhances highways, urban and built-up areas and croplands and all of them have appeared as lighter tone.

Soil Adjusted Vegetation Index (SAVI)

Υπολογίστε τον Δείκτη βλάστησης SAVI :
SAVI is calculated as a ratio between the R and NIR
values with a soil brightness correction factor (L) defined as 0.5 to accommodate most land cover types.
((NIR - R) / (NIR + R + L)) * (1 + L)

<u>In Landsat 4- 7,</u>

SAVI= ((Band 4 – Band 3) / (Band 4 + Band 3 +0.5))* (1.5).

<u>In Landsat 8</u>,

SAVI= ((Band 5–Band 4) / (Band 5+ Band 4 + 0.5))* (1.5)