ÇEV 361
Coğrafi Bilgi Sistemleri ve Uzaktan Algılama

Uzaktan Algılamada Çevre Mühendisliği Uygulamaları

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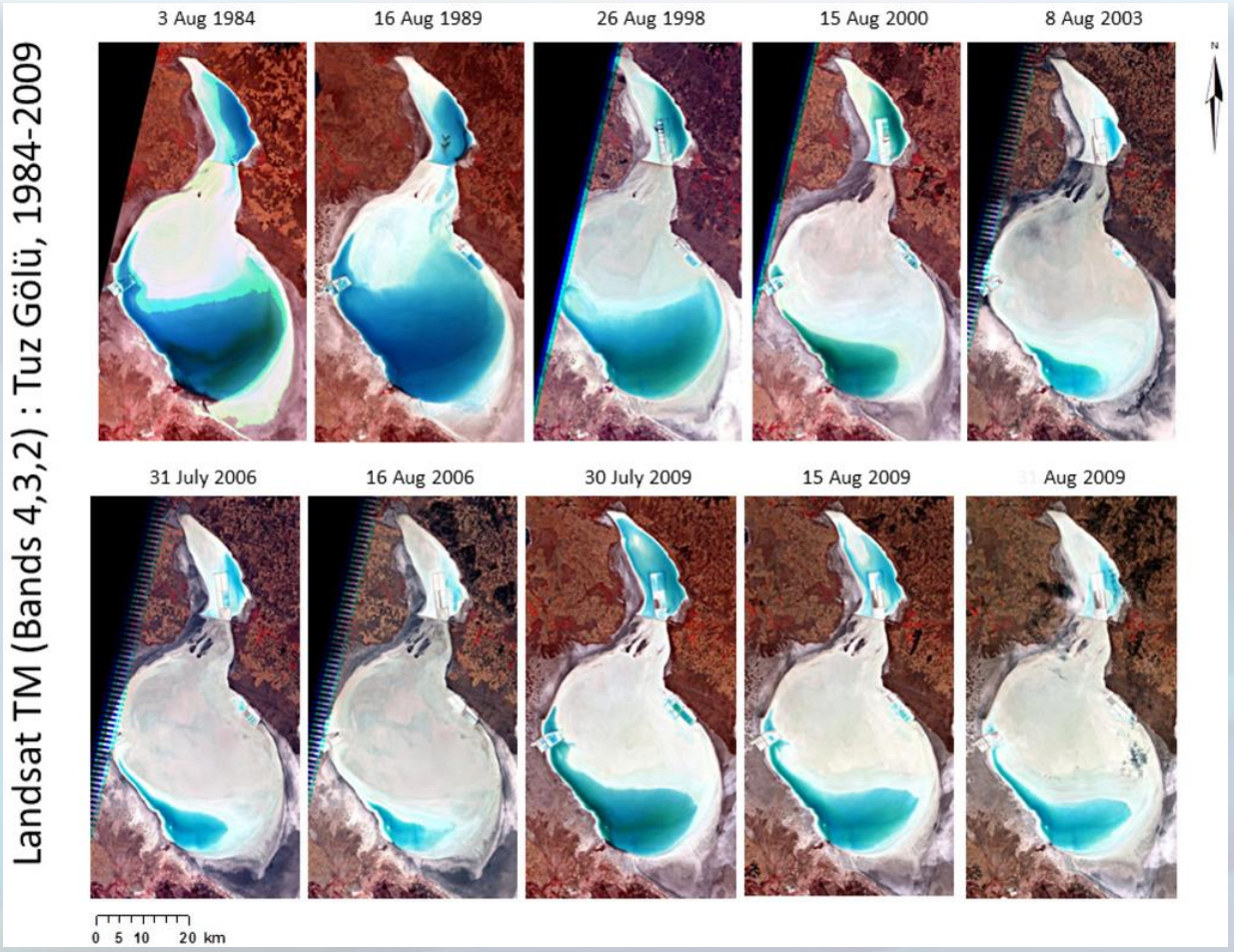
http://www.ozgurzeydan.com/

Örnek Uygulamalar

- Değişiklik belirleme
- Su kalitesi
  - Ötrofikasyon
  - Deniz salyası
  - Deniz suyu sıcaklığı
  - Petrol sızıntıları
- Hava kalitesi
  - Toz taşınımı
  - Atmosferik ozon, NO_2
- Orman yangınları

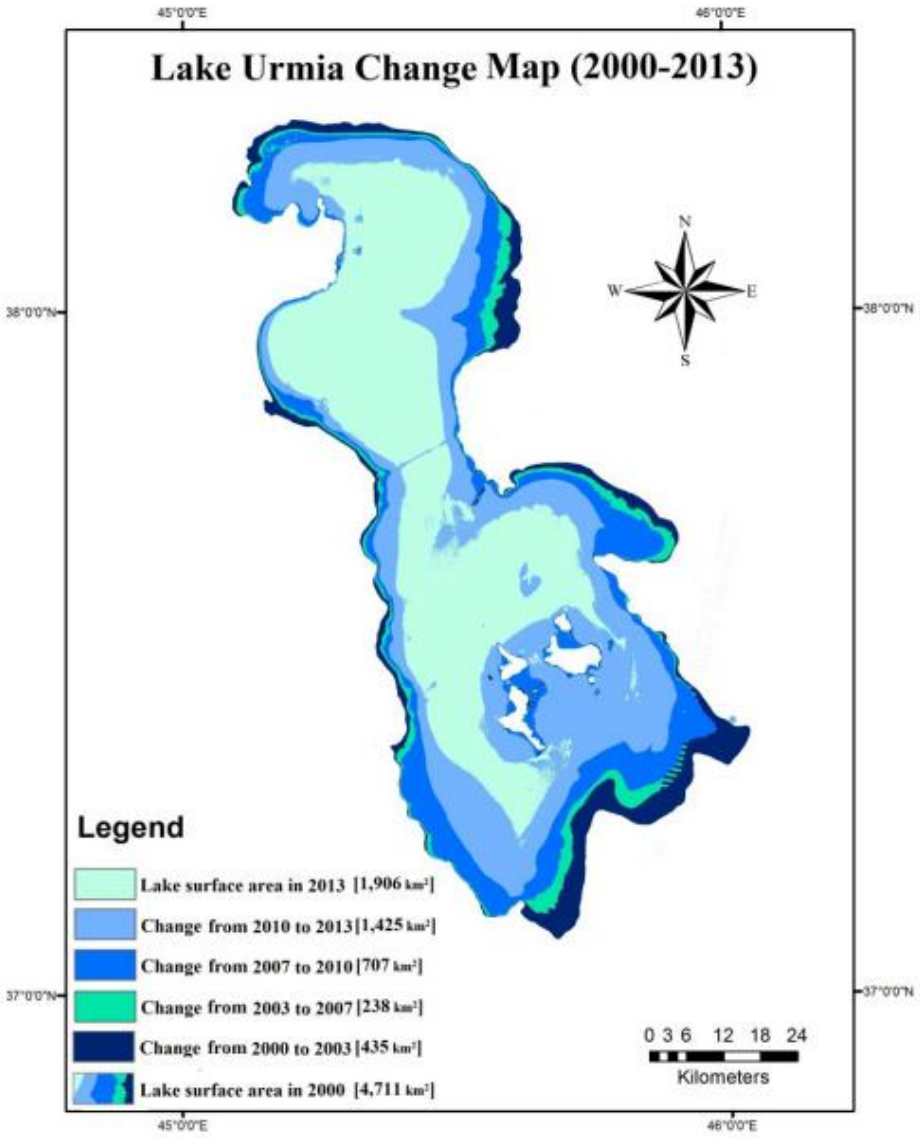
Değişiklik Belirleme



Landsat TM colour composite images (Red, Green, Blue = TM 4, 3, 2) showing Tuz Gölü for the months of July and August from 1984 to 2009. The blue patches represent shallow water

Odongo, V.O.; Hamm, N.A.S.; Milton, E.J. Spatio-Temporal Assessment of Tuz Gölü, Turkey as a Potential Radiometric Vicarious Calibration Site. *Remote Sens.* **2014**, *6*, 2494-2513.

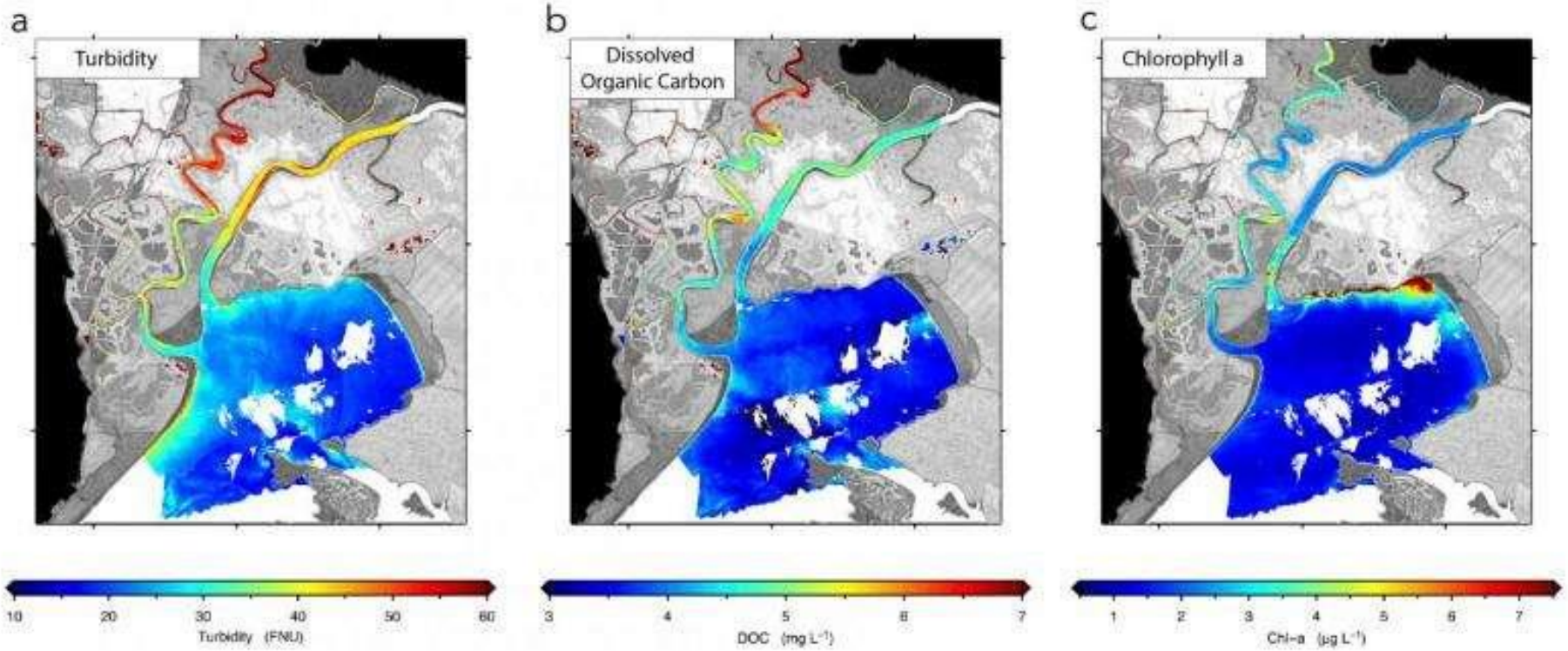
Figure 3. Lake Urmia surface area changes map in the period 2000–2013.



Rokni, K.; Ahmad, A.; Selamat, A.; Hazini, S. Water Feature Extraction and Change Detection Using Multitemporal Landsat Imagery. *Remote Sens.* **2014**, *6*, 4173-4189.

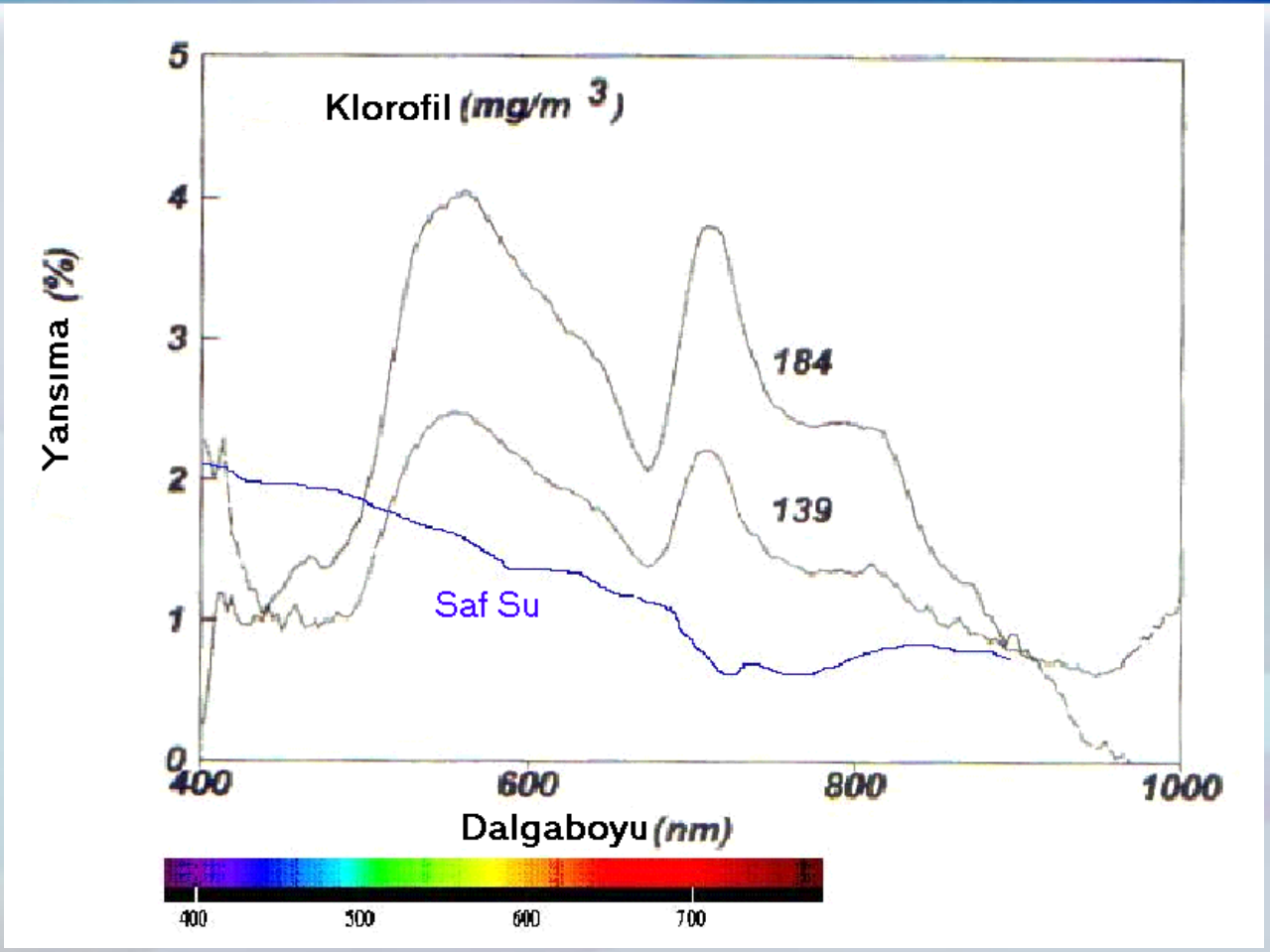
PRISM

Portable Remote Imaging Spectrometer



https://prism.jpl.nasa.gov/index.html
https://phys.org/news/2016-02-nasa-airborne-quality-sensor.html

Sudaki Klorofil Konsantrasyonuna Bağlı Olarak Yansıma Özelliklerinin Değişmesi



Schalles, J.F., Schiebe, F.R., Starks P.J., Troeger W.W., 1997, “Estimation of algal and suspended sediment loads (singly and combined) using hyperspectral sensors and integrated mesocosm experiments”, Proceedings of the 4th International Conference on remote Sensing for Marine and Coastal Environments, 1, pp. 247-248

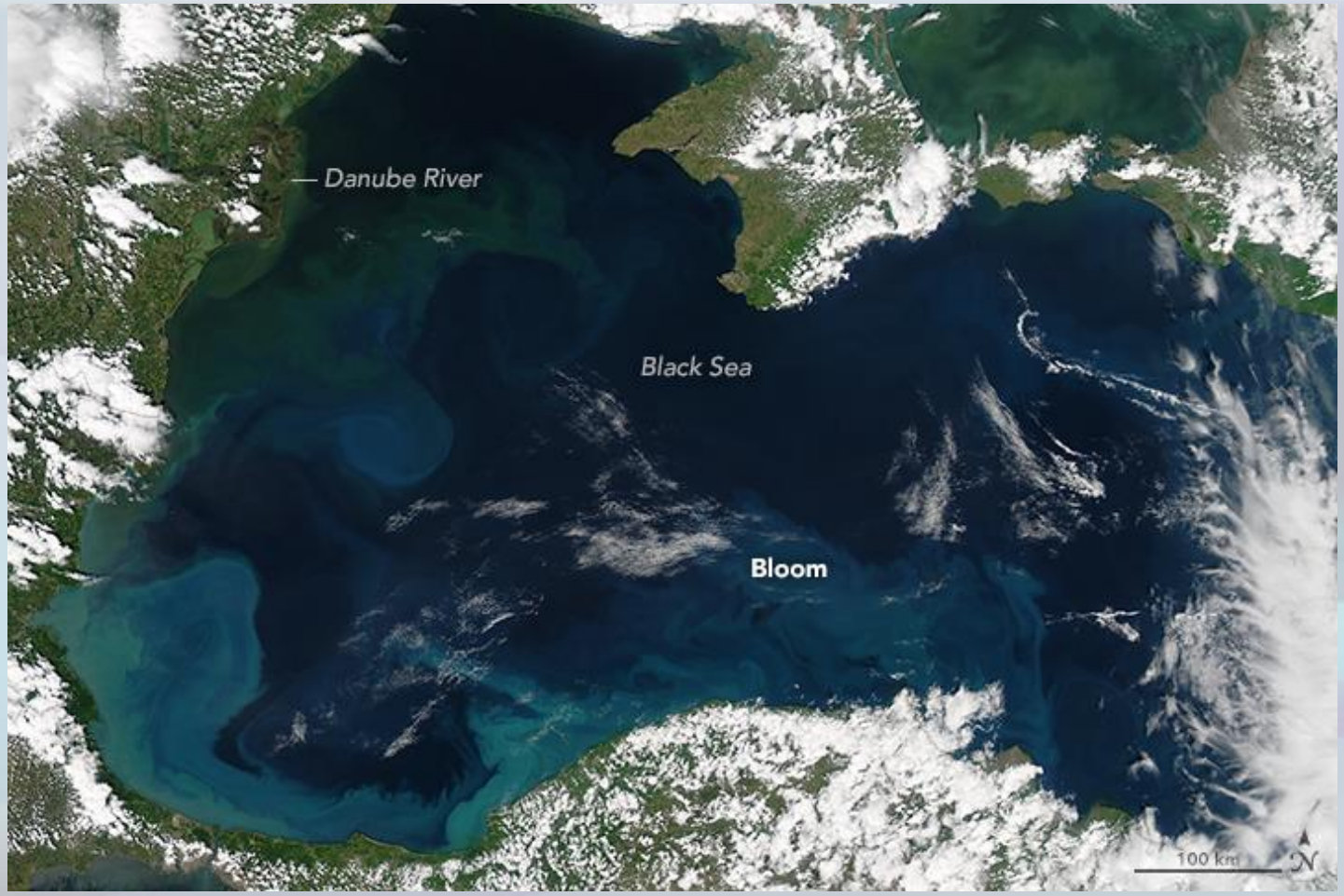
Landsat TM görüntüleri ve Klorofil-a

Table 3. Correlation coefficients for various models

Model No.	Variables	R	Std. Error of the Estimate
1	Chlorophyll-a and Log(B2/B3) (Log(Green/Red))	0.112	1.07467
2	Chlorophyll-a and B2/B3 (Green/Red)	0.156	1.06835
3	Chlorophyll-a and B3 (Red)	0.734	0.73443
4	Chlorophyll-a and B2 (Green)	0.864	0.54441
5	Total Suspended Solids and B3/(B1+B2+B3)	0.244	5.4979
6	Total Suspended Solids and B3	0.147	5.6073
7	Turbidity and B3/(B1+B2+B3)	0.461	10.7484
8	Turbidity and B3	0.247	11.7382
9	Ln(Turbidity) and B3	0.171	-

Arun Kulkarni / Procedia Computer Science 6 (2011) 475–480

Uzaktan Algılama - Ötrofikasyon



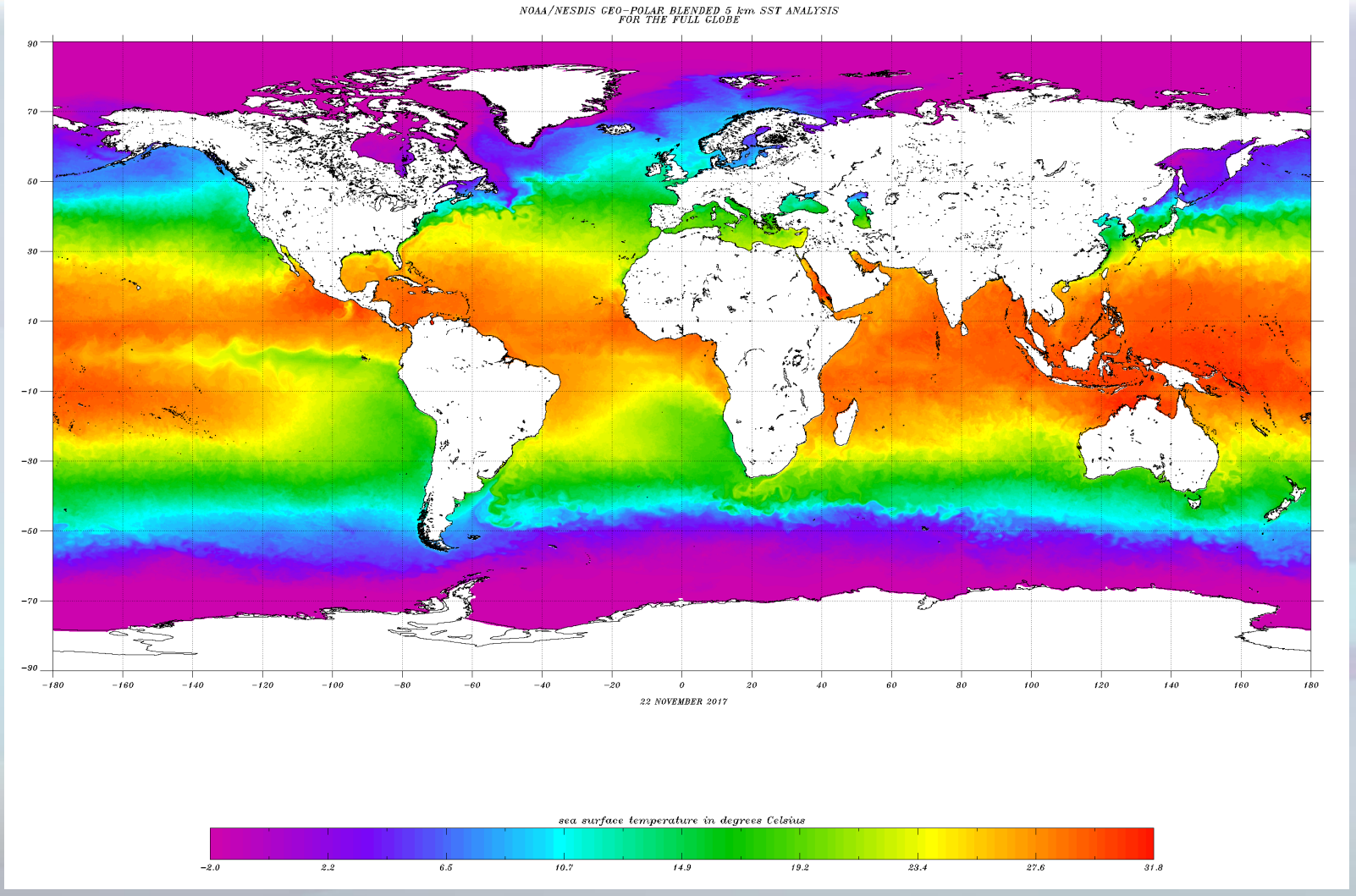
https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=88017

Deniz Salyası (Müsilaj)

Sentinel2 görüntüsü

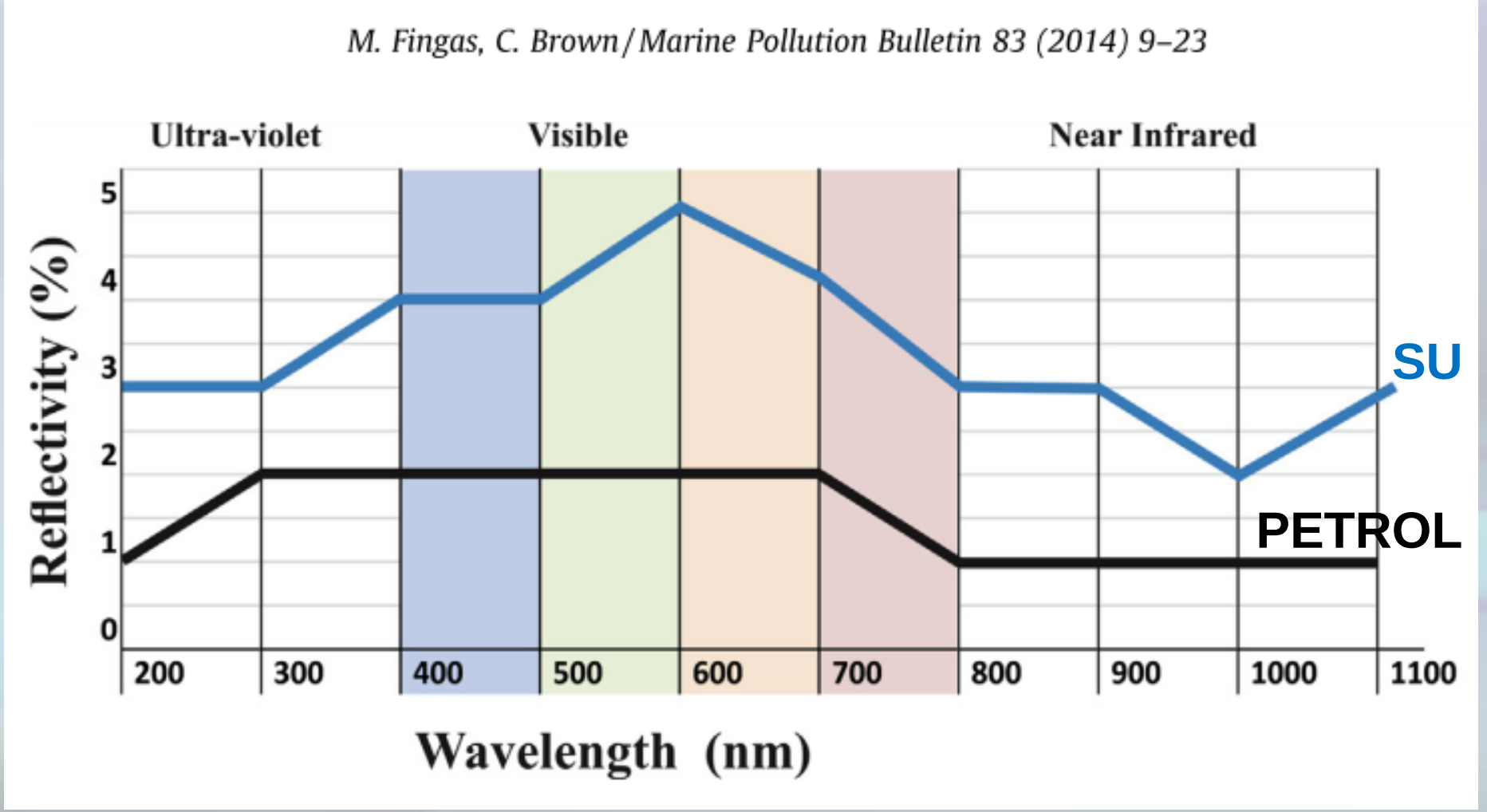
https://mobile.twitter.com/copernicuseu/status/1400699610914557956?ref_src=twsrc%5Etfw

Deniz Yüzey Sıcaklığı



http://www.ospo.noaa.gov/Products/ocean/sst/contour/index.html

Petrol Sızıntıları



Petrol Sızıntıları

Fig. 5. An infrared image of the Gulf spill in 2010. The black objects near the middle and lower portions of the oil are oil. The black objects near the top are islands and shoreline. The oil slick is patchy as the sheen does not show up. This image is from the infrared sensor ASTER on the Terra satellite (NASA).

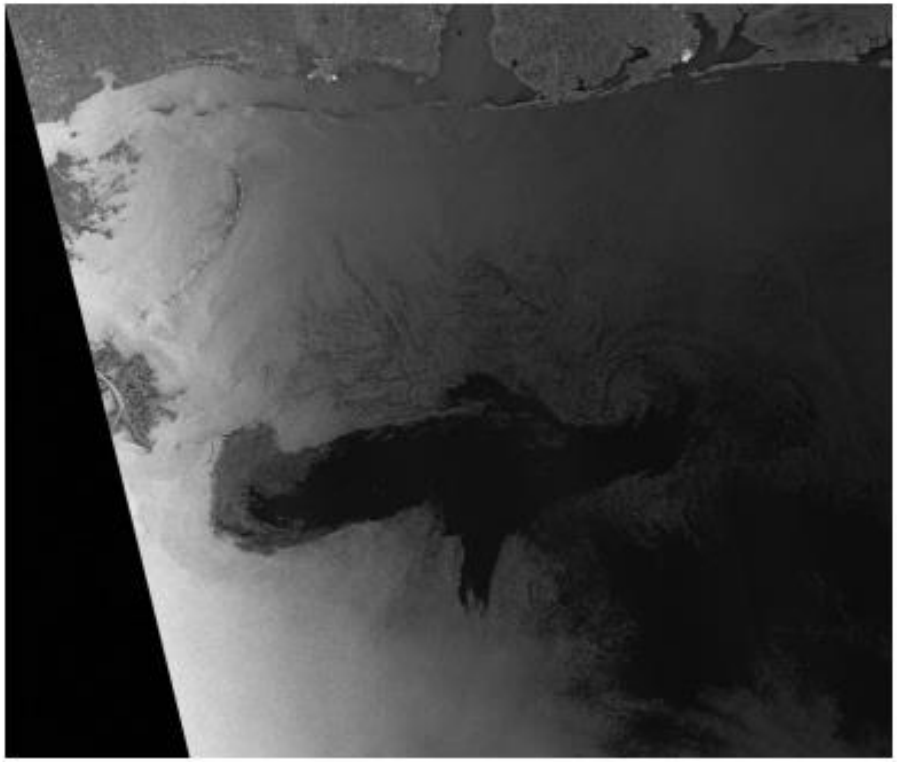
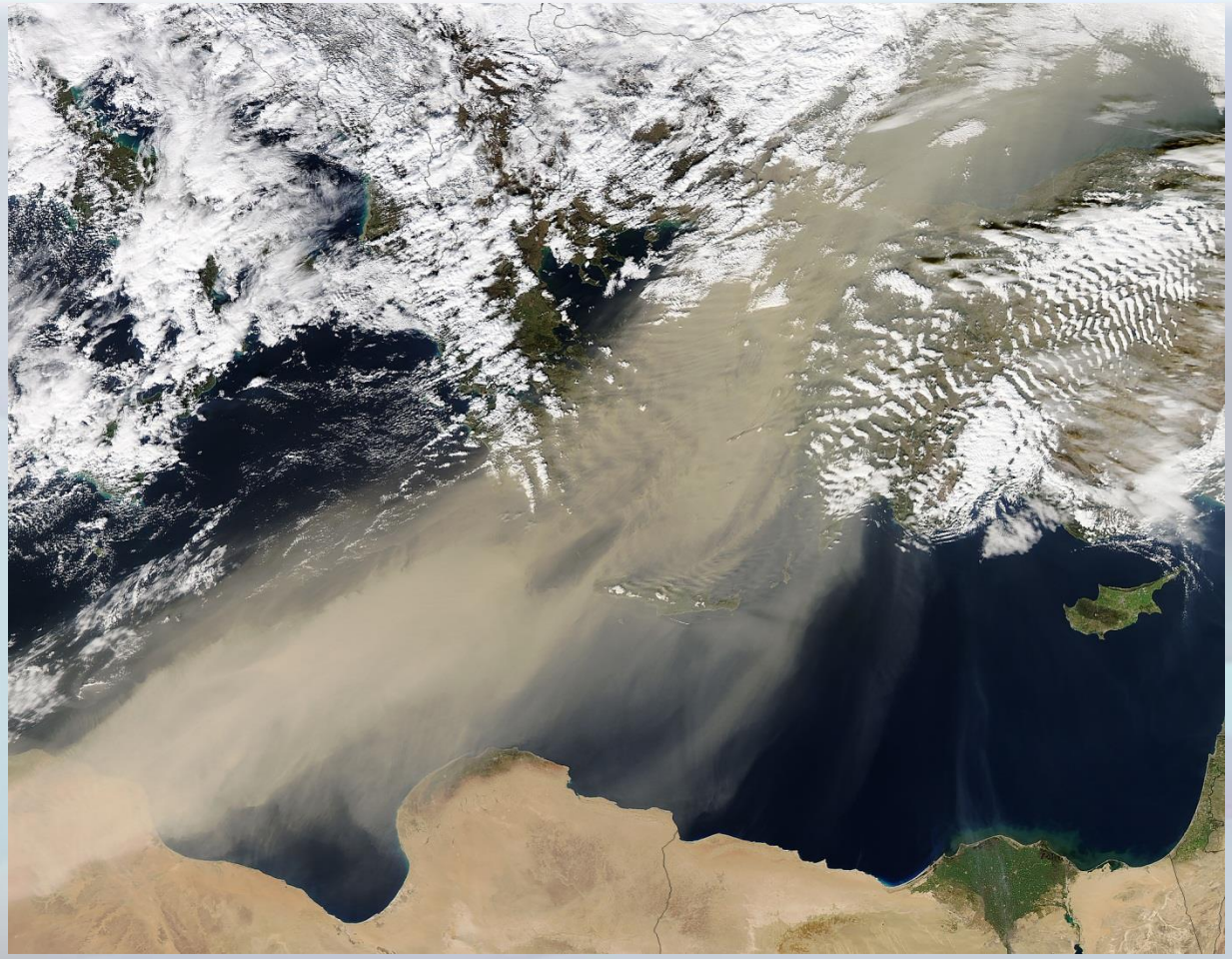


Fig. 8. The Deepwater Horizon as imaged by Radarsat (EOSANP).

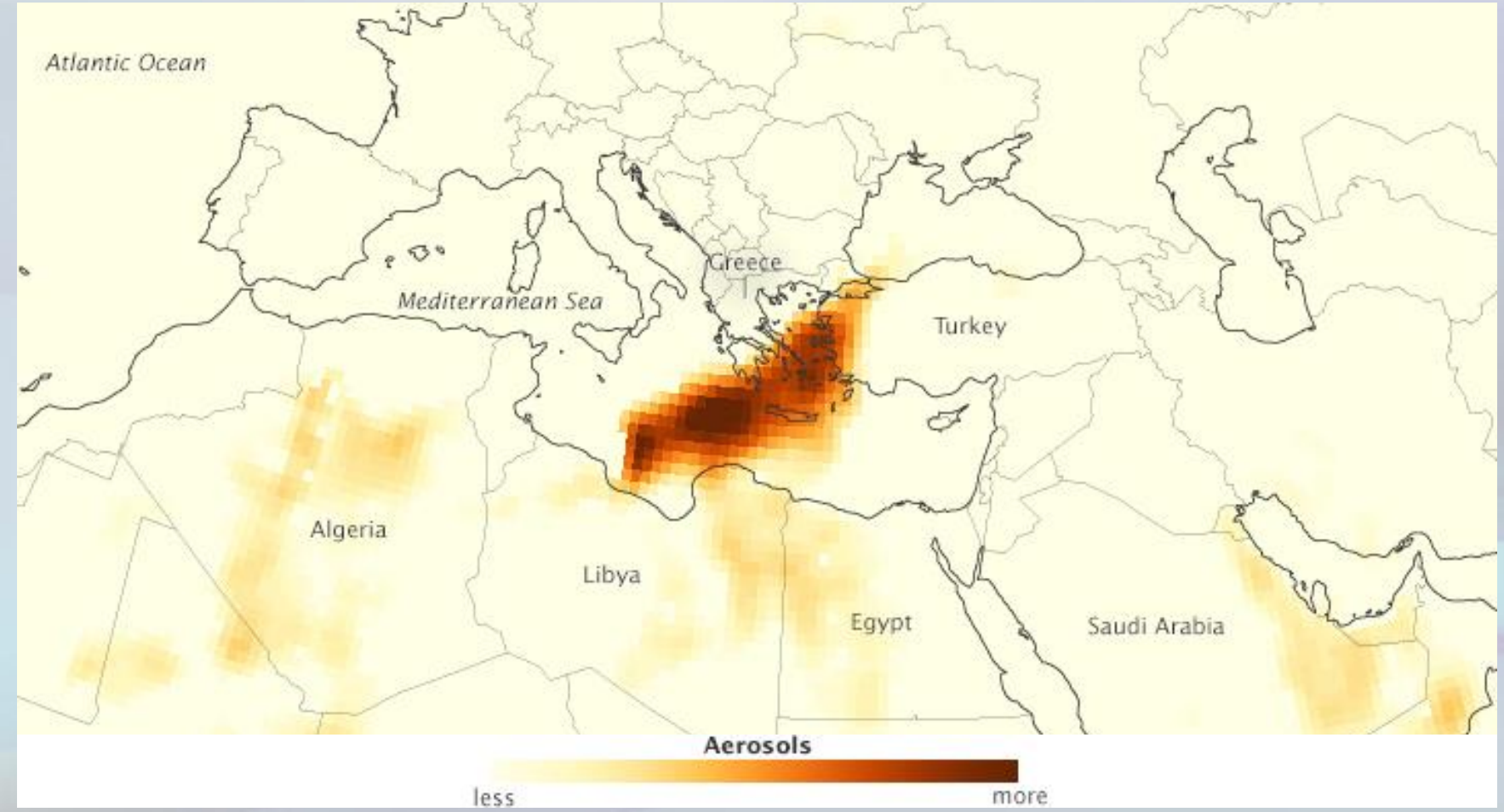
M. Fingas, C. Brown / Marine Pollution Bulletin 83 (2014) 9–23

Toz Taşınımı



https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=85218

Toz Taşınımı



https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=85218

Partikül Madde

Atmospheric Pollution Research 10 (2019) 1565–1576

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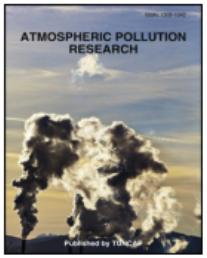

Using MODIS derived aerosol optical depth to estimate ground-level $PM_{2.5}$ concentrations over Turkey

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[a] Department of Environmental Engineering, Zonguldak Bülent Ecevit University, Zonguldak, 67100, Turkey
[b] School of Earth & Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA, 30332, USA

https://doi.org/10.1016/j.apr.2019.05.005

Partikül Madde

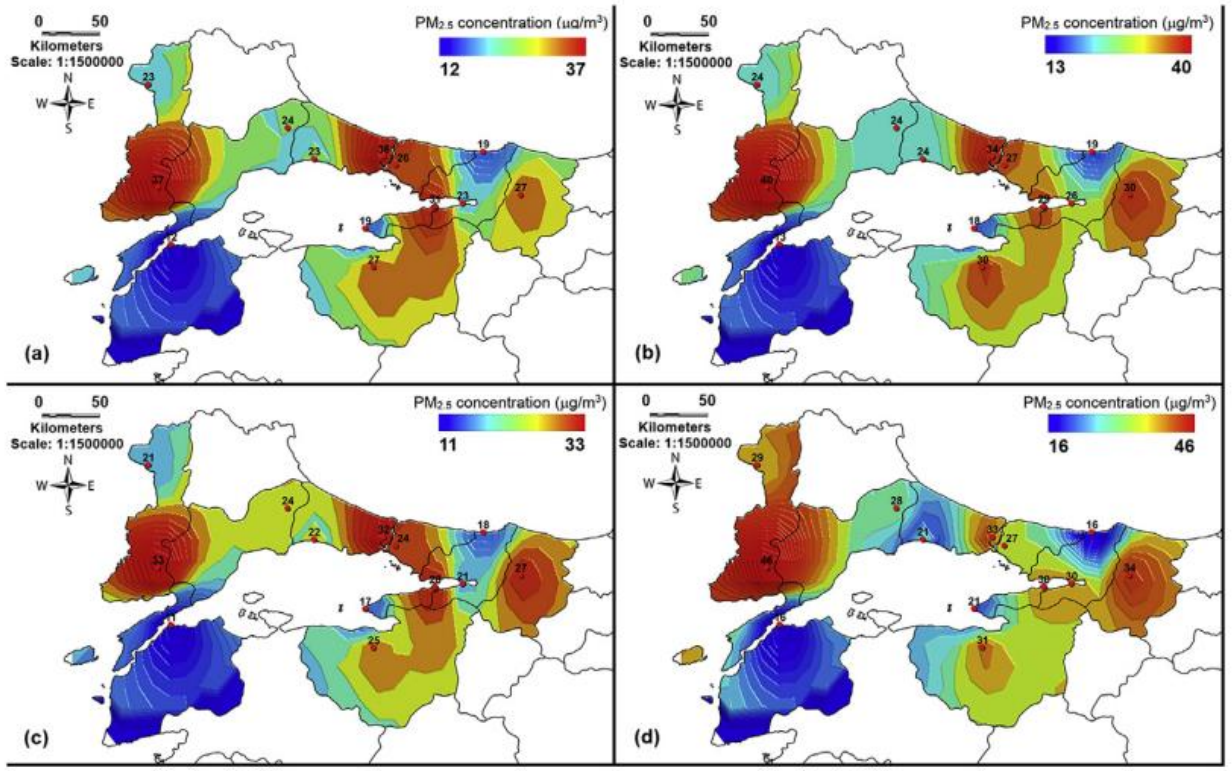
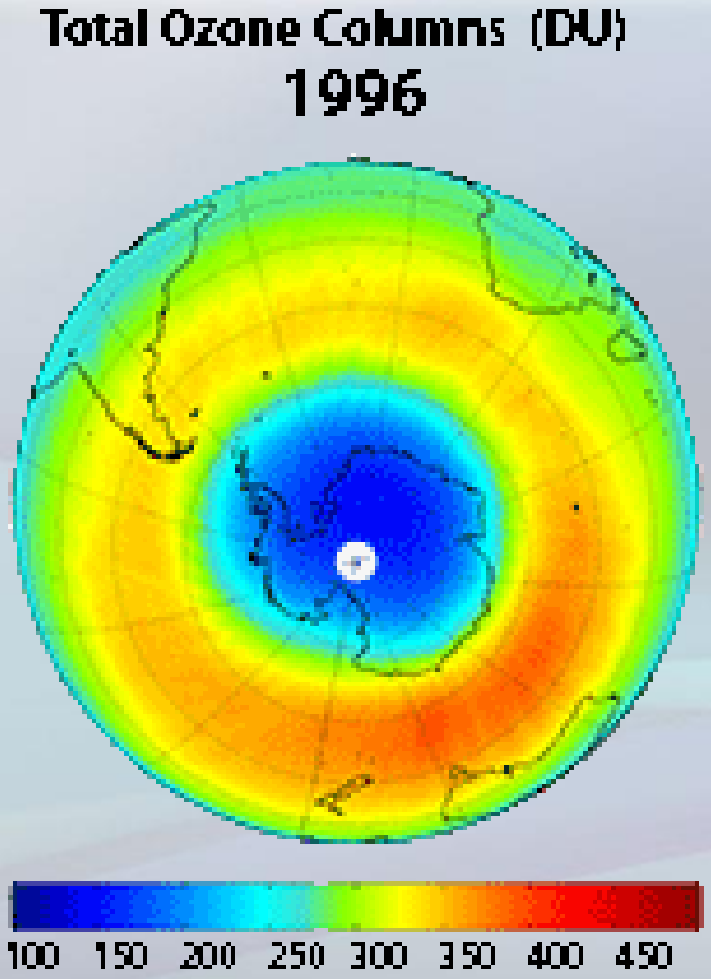


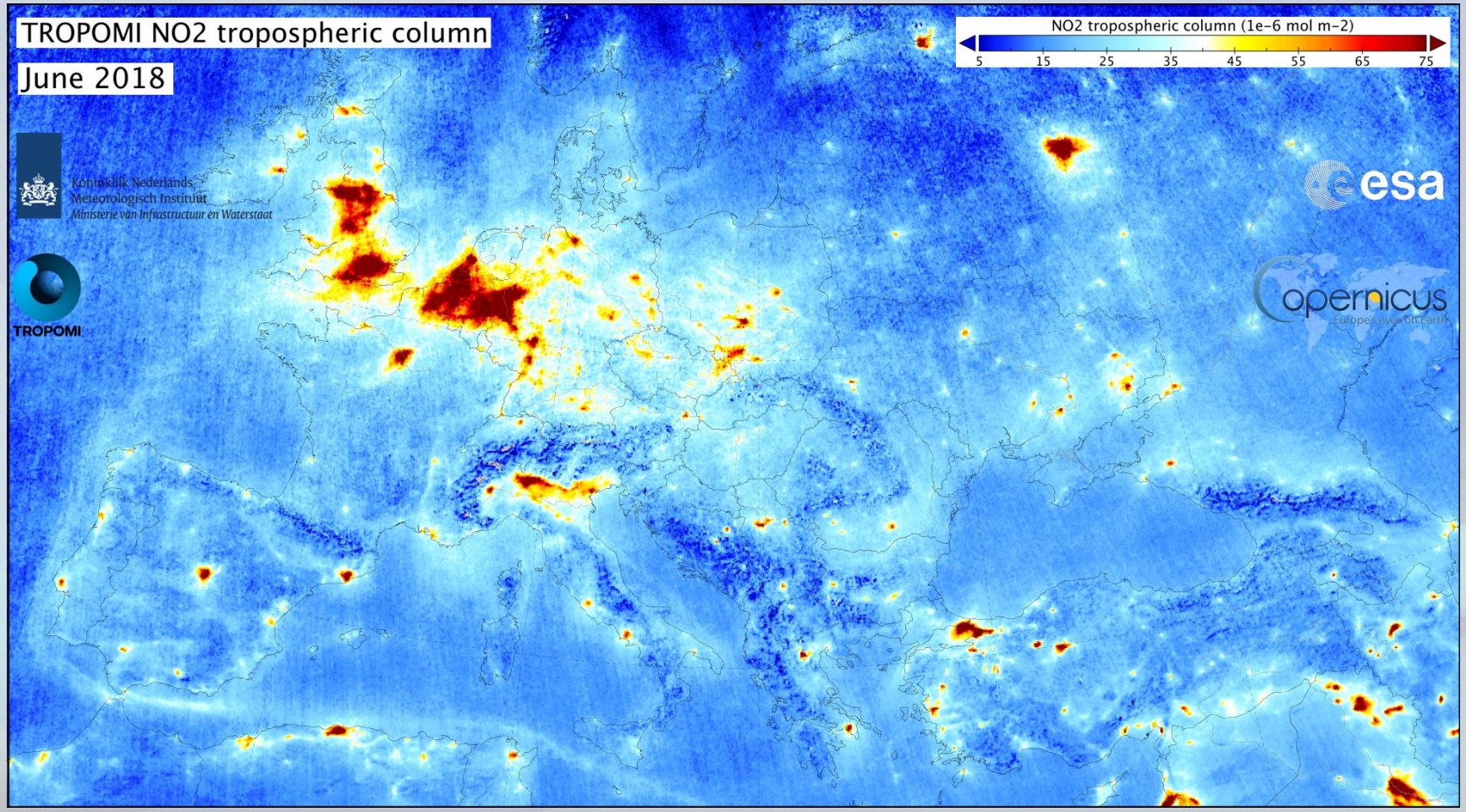
Fig. 4. Average $PM_{2.5}$ distribution maps in heating seasons a: 2012–2013, b: 2013–2014, c: 2014–2015 and d: 2015–2016.

Stratosferik Ozon İncelmesi

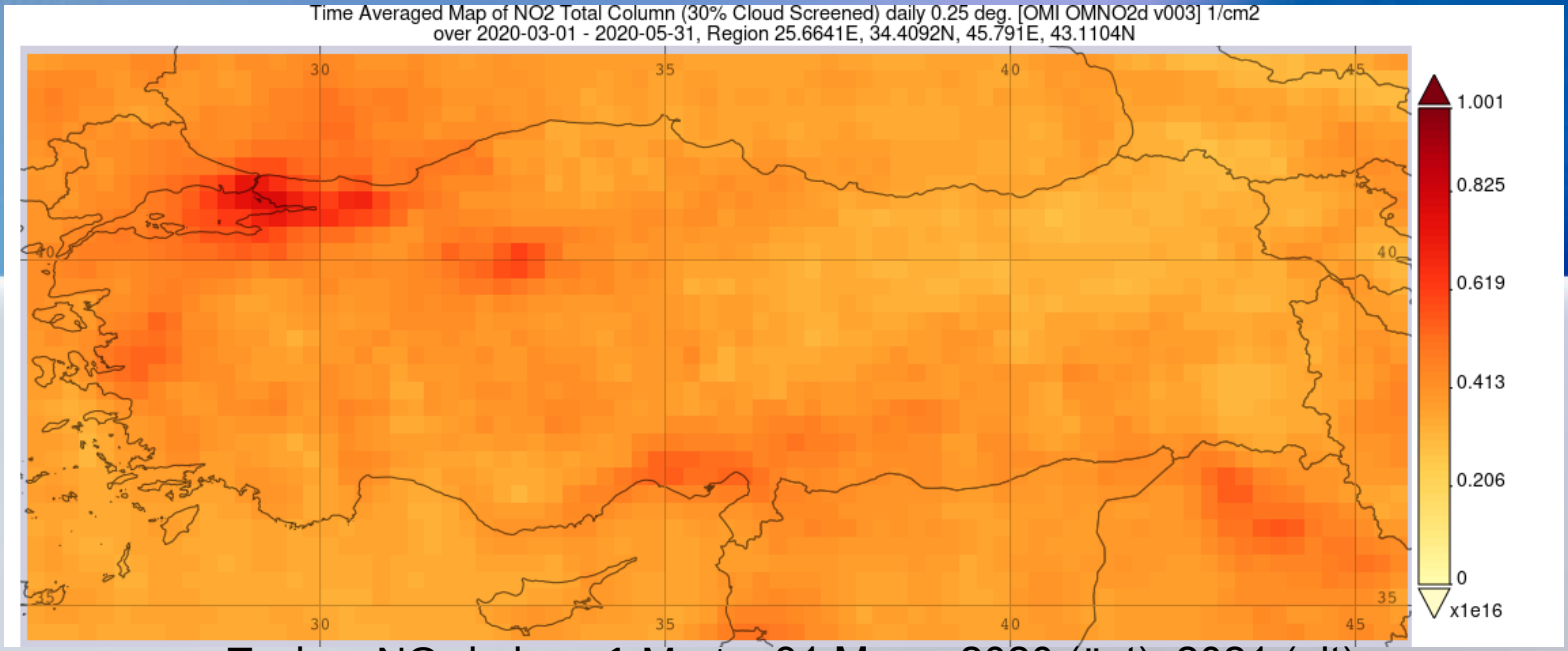


http://www.theozonehole.com/ozoneholehistory.htm

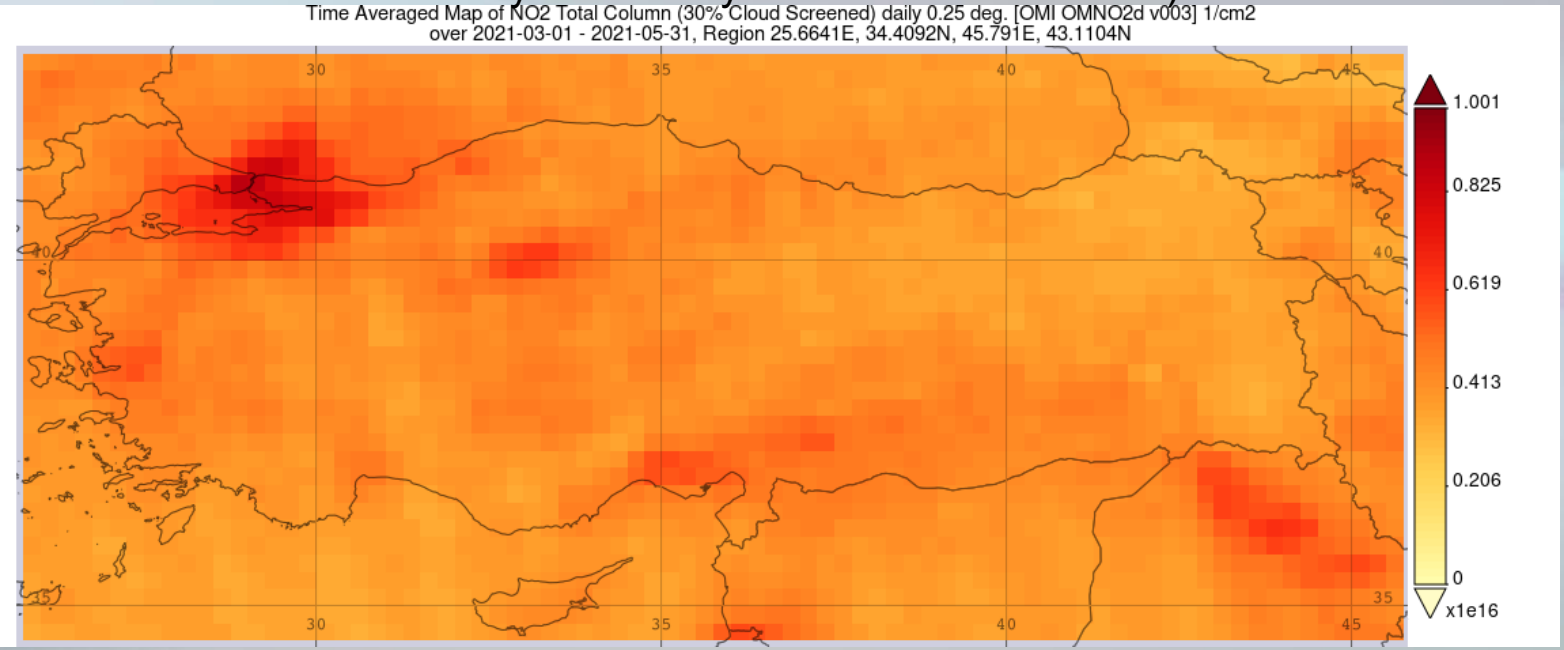
Atmosferik NO_2



http://www.tropomi.eu/data-products/nitrogen-dioxide



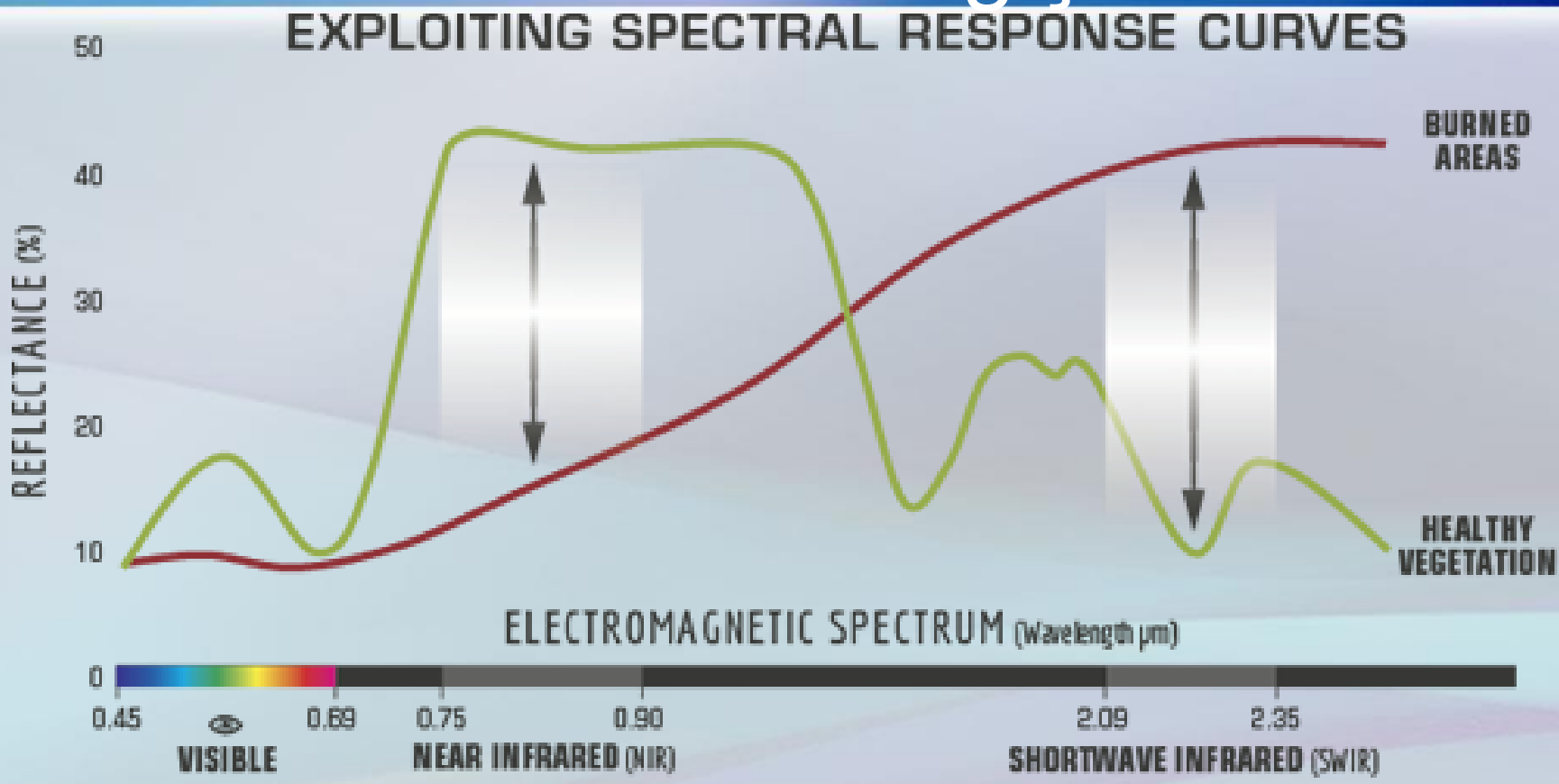
Toplam NO_2 kolonu 1 Mart – 31 Mayıs 2020 (üst), 2021 (alt)
Covid-19 kısıtlamalarının etkileri (not: kesin yargıda bulunmak için meteoroloji ve atmosferik reaksiyonlar da aynı anda incelenmelidir.)



Orman Yangınları

Landsat-8 OLI gerçek renk görüntü (31 Temmuz 2021)
https://earthobservatory.nasa.gov/images/148650/fires-rage-in-turkey

Yanan Alanların Yansıma Özelliklerinin Değişmesi



$$Normalized\ burn\ ratio\ (NBR) = \frac{(NIR - SWIR)}{(NIR + SWIR)}$$

https://towardsdatascience.com/monitoring-wildfires-using-earth-observation-satellites-e3ee7113bae4