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USE OF MODIS-BASED VEGETATION CONDITION INDEX (VCI) FOR DROUGHT MONITORING IN TUNISIAN DRYLANDS

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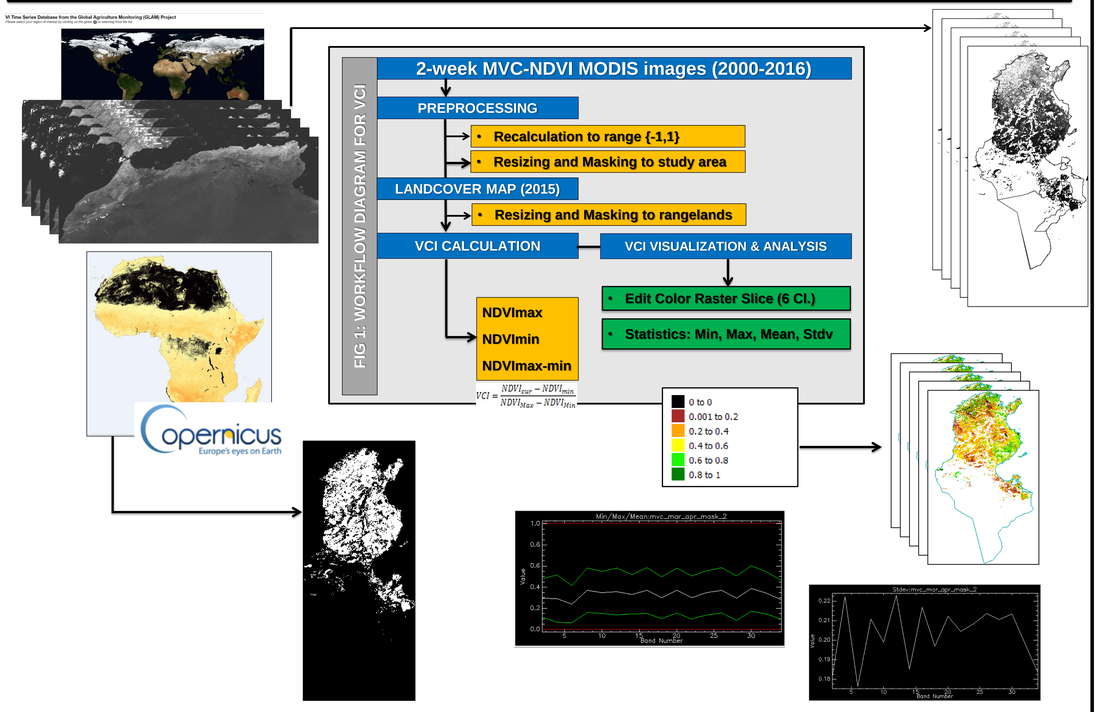
INTRODUCTION Desertification - a persistent loss in ecosystem services - is driving the loss in land productivity. Existing water shortages in drylands are projected to increase over time due to population increase, land cover change, and global climate change (MEA, 2005) (1). In Tunisian drylands, land degradation and droughts are being the main constraints in Southern Tunisia in a context of climate change. Establishing the relationships between land-climate dynamics, drought and land surface modelling issues is urgent to effectively contribute to the ongoing national programs addressing Desertification, Land Degradation, and Drought (DLDD). Satellite-sensor data are continuously available and can be used to detect the onset of a drought, its duration and magnitude based on remote sensing and geospatial technologies. Drought monitoring and evaluating its characteristics is vital for a better sustainable development of water resources.

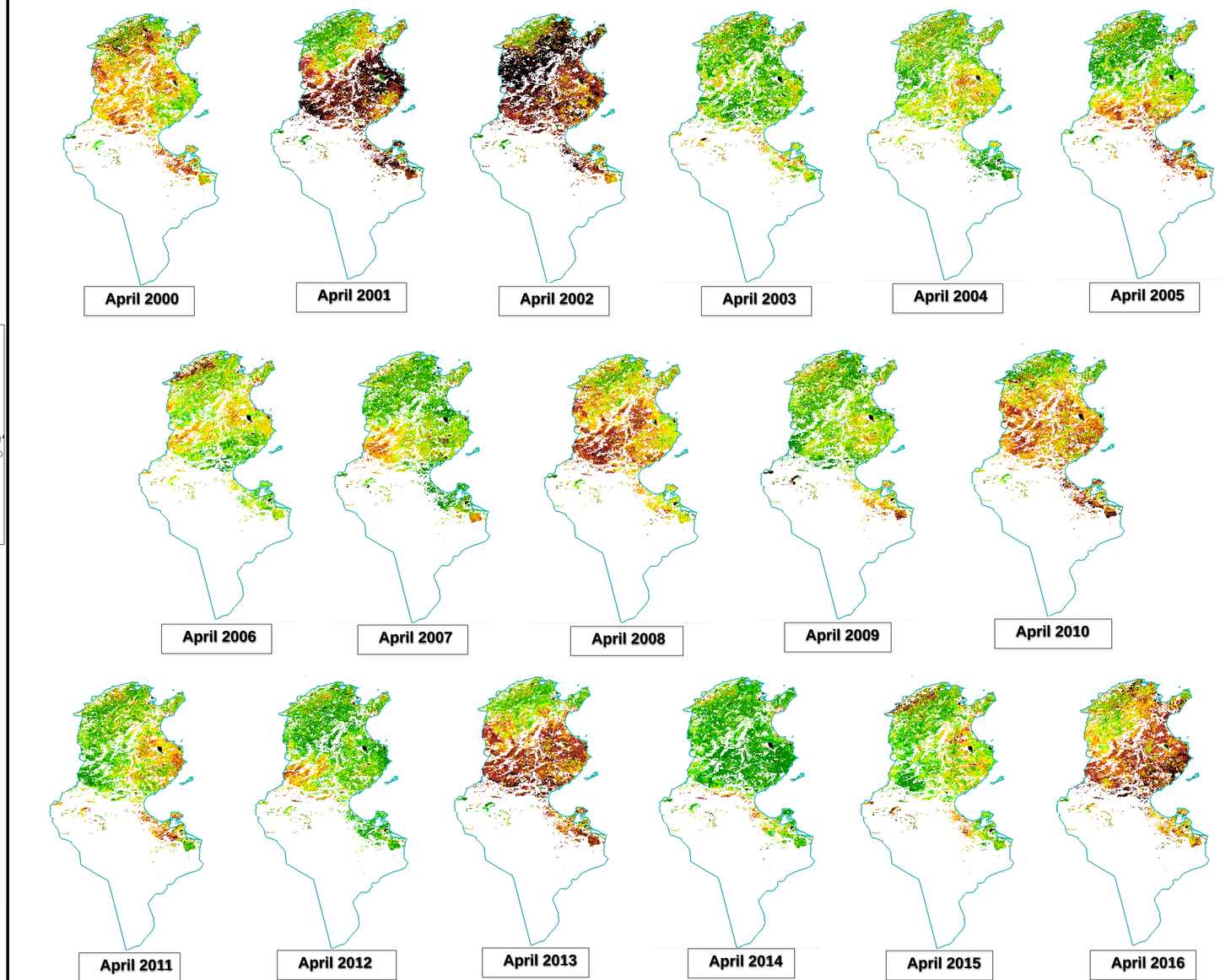
METHODOLOGY Application of a multi-temporal analysis of **MODIS-based Vegetation Condition Index (VCI)** to support drought monitoring and early warning (2) (3) (4) (5) (Fig. 1). **Meteorological drought** is often defined by a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place falls below the climatically appropriate moisture supply.

Data Acquisition:

- **Two weeks composites of NDVI (MVC: Maximum Value Compositing) from MODIS Satellite Imagery** Of the years **2000** to **2016** of **March** and **April**, highest vegetation growth. Spatial resolution of 250 meters (6)
- **Land Cover Map**: Copernicus Landcover map (2015) of Shrub cover using the Land Cover Classification System (LCCS) developed by FAO since the objective is to monitor the meteorological drought impacts on natural vegetation, Spatial resolution of 100 meters (7)



TUNISIA
Long.: 7°-12°E Lat.: 32°-38°N Area: 165000 km² Climate variability: Mediterranean Sea, Sahara Coastline: 1300 km Ann. rainfall: (150-1500 mm)



KEY REFERENCES (1) Millenium Ecosystems Assessnent (MEA), 2005, (2) Kogan, F.N., 1995: Application of vegetation index and brightness temperature for drought detection. Advances in Space Research, 15(11): 91–100. (3) Liu, W.T. and F.N. Kogan, 1996: Monitoring regional drought using the Vegetation Condition Index. International Journal of Remote Sensing, 17(14): 2761–2782. (4) Kogan, F.N. 1997: Global drought watch from space. Published Online: 1 April 1997. Bulletin of the American Meteorological Society. (5) UN-Spider Recommended Practice drought monitoring using the Vegetation Condition Index (VCI), (6) Global Agriculture Monitoring (GLAM) Project of Maryland University: http://pekko.geog.umd.edu/usda/beta/data_new.php?dsRegionId=3 (7) Copernicus: http://land.copernicus.vgt.vito.be