



Emergency
Management

Global Drought Information System (GDIS) and Global Drought Observatory (GDO)

Jürgen Vogt

*European Commission
Joint Research Centre (JRC)
juergen.vogt@ec.europa.eu*



Main Characteristics of GDIS and GDO



<https://www.drought.gov/gdm>

GEO: Global Drought Information System (GDIS)

- Portal hosted by NOAA
- Goal: Develop and deploy early warning maps; identify atmospheric and oceanic triggers of drought; present synthesized information through the portal
- Focus on monitoring and forecasting meteorological drought hazard
- Research oriented, customer not defined

Global Drought Observatory (GDO)

- Portal hosted by JRC
- Goal: Monitor and forecast drought hazard as well as assess the (dynamic) risk of impacts in different sectors
- Focus on sectorial risk assessment (hazard, exposure, vulnerability)
- Operational oriented, Main customers: Emergency Response Coordination Centre (ERCC) of the European Commission; Global Disaster Alert and Coordination system (GDACS) of UN, EC, and disaster managers



<http://edo.jrc.ec.europa.eu/gdo>



Home Page

NIDIS Global Drought Information System U.S. Drought Outlook
www.drought.gov

Beyond Drought

Drought is an insidious natural hazard with far-reaching impacts that range from economic losses to loss of agriculture and livelihood. Drought can cause or exacerbate water, food, and national security hazards. The GDIS is an international effort to pull together the best non-prescriptive drought information from local providers and provide an "apples to apples" comparison of drought conditions around the world.

[Current Conditions](#) [Interactive Maps](#) [Regional Drought](#)

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Current Conditions

NIDIS Global Drought Information System U.S. Drought Outlook
www.drought.gov

Current Conditions

[Drought Monitor](#) [1-Month SPI](#) [2-Month SPI](#) [3-Month SPI](#) [Vegetation Health Index](#)

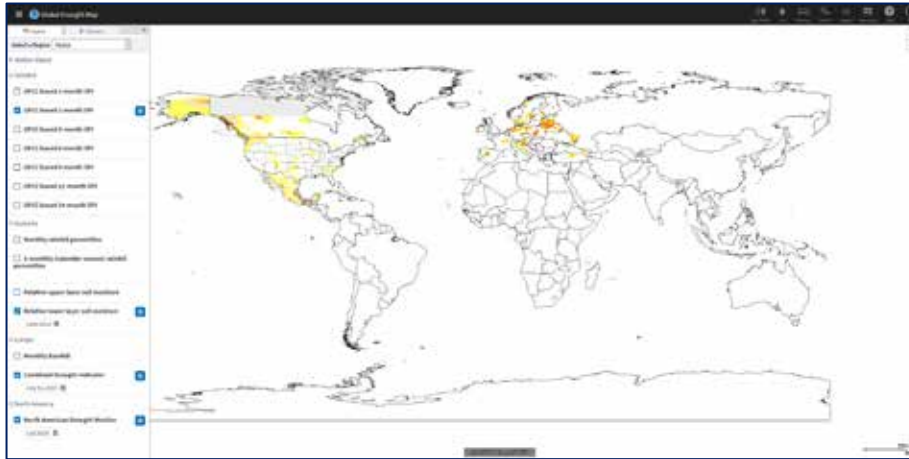
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Situation 22 August 2019:

- GPCC DI (July 2019)
- SPI-1, -2, -3 (May-July '19)
- VHI (29 July)



Interactive Maps



Situation 22 August 2019:

- Only NADM and EDO display
- GPCP and Australian data not available or outdated

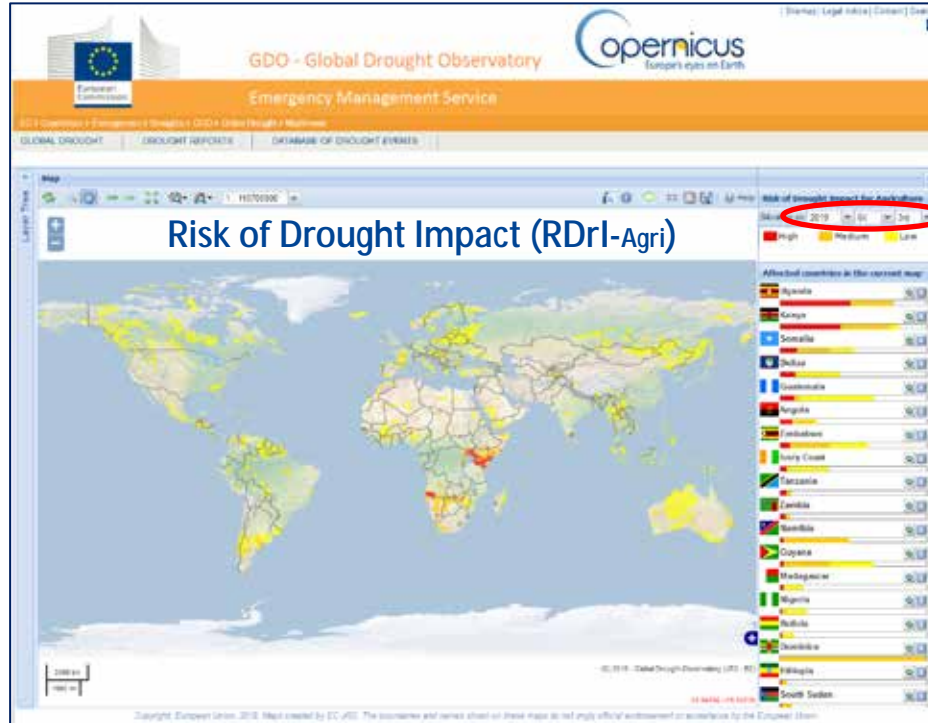
Regional Drought





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Global Drought Observatory (GDO)



<http://edo.jrc.ec.europa.eu/gdo>

3rd dekad, April 2019

Hierarchical list of
affected countries

The risk of impact is evaluated based on the drought hazard, exposure and the vulnerability.
Updated every 10 days.

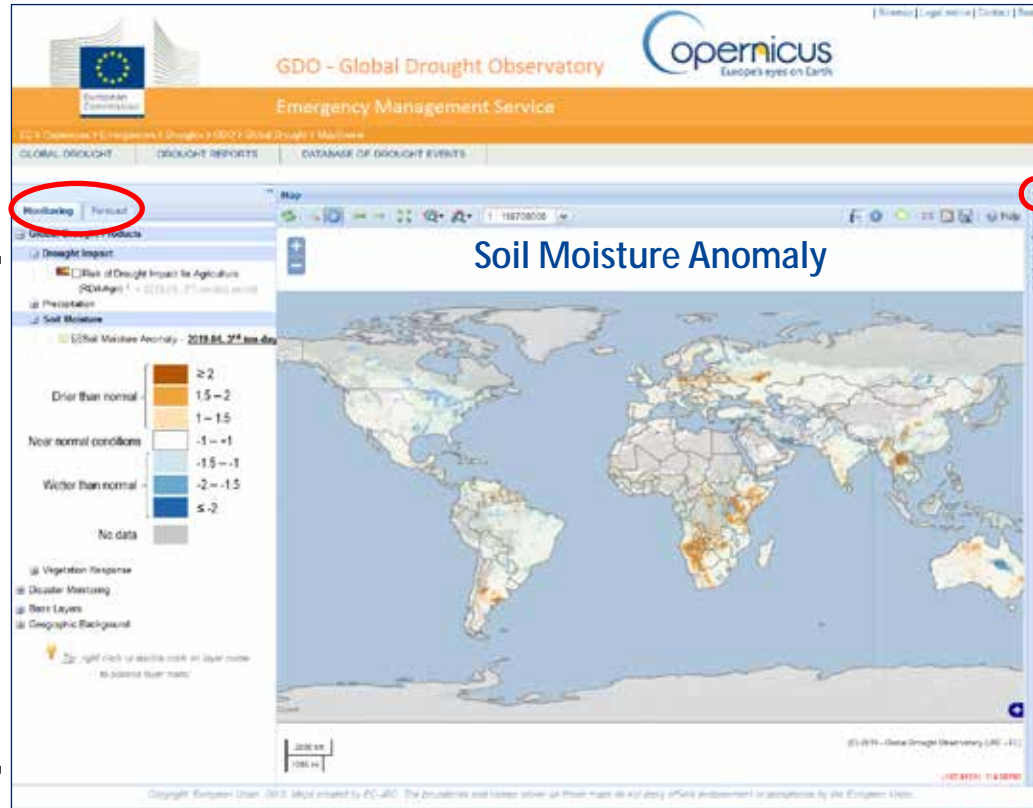


Global Drought Observatory (GDO)

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Monitoring & forecasting menu open

Access to indicators and other information layers



Impact menu hidden



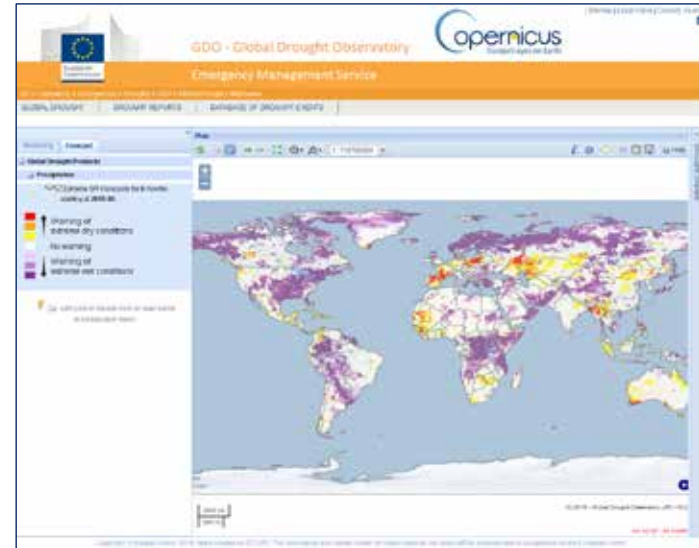
GDO: Forecasting

Early warning of extreme wet/dry conditions :

- From 1-month to 6-months lead time (i.e. SPI1, SPI3 and SPI6)
- Derived from Seasonal S5 model of ECMWF



Forecast for May to July 2019



Forecast for May to October 2019

Warning levels increase with the intensity (median) and the coherency (spread) of the ensemble forecast



Global Database of Past Drought Events



Graphical Interface to explore the global database of meteorological drought events using a dash-board tool

- Based on SPI and SPEI
- 1951 to 2016
- Regular updating

Table of historical events in France

Drought events in France, detected by Spi-3									
start	peak	end	max ext	duration	severity	intensity	average area involved	score	widest area involved
Aug 2010	Sep 2010	Dec 2010	Sep 2010	5 months	7.72	1.44	56 %	13	92 %
Dec 2015	Dec 2015	Jan 2016	Dec 2015	2 months	3.13	1.57	60 %	11	81 %
Mar 2011	May 2011	Jul 2011	May 2011	5 months	7.61	1.52	56 %	14	85 %
Sep 2009	Oct 2009	Nov 2009	Oct 2009	3 months	2.57	0.86	35 %	4	81 %
Nov 2007	Nov 2007	Feb 2008	Nov 2007	4 months	3.39	0.85	31 %	6	67 %

[Spinoni et al., 2019; J. Hydrol.: Reg. Studies, doi: 10.1016/j.ejrh.2019.100593]



GDO: Injecting Drought Events in GDACS

Injecting significant drought events into GDACS



GDACS: Global Disaster Alert and Coordination System,
www.gdacs.org

STEPS:

- 1) Automatic detection of agricultural drought events (other types to follow)
- 2) Evaluation and classification of detected drought events
- 3) Publication of confirmed and classified in GDACS



GDO: Analytical Reports



In case of severe droughts
EDO & GDO produce
Analytical Reports on the
drought evolution and
related impacts ...

.... and **Daily Maps**
for ERCC





GDO: Other Features

Other features:

- Side by side maps of different indicators or of time-series of indicators
- On the fly reports of drought characteristics and areas affected
- Standardized Indicator Factsheets
- Soft validation by media monitoring and customer feedback
- Analyzing past trends and future projections (e.g. CORDEX)
-

Ongoing developments:

- Linking to (sub-)continental monitoring systems
- Inclusion and further development of an impact database (EDII)
- Exposure, vulnerability & risk assessments for power generation, public water supply
- Studying the changing risk under climate change
- Testing groundwater indicators (e.g. GRACE)
- Exploring different meteorological and satellite data sources



Summary: Current Situation

GDIS:

- Limited functionality, based on in-kind contributions
- Customer not clearly defined
- Strong research component, especially on modelling and forecasting
- Proposal for GEO WP 2020-22 submitted

GDO:

- Operational running and fully functional
- Customers clearly defined
- Research on indicators, risk assessment, impacts, forecasting and climate change impact
- Part of the Copernicus Emergency Management Service EMS (Floods, Droughts, Wildfires, Rapid and Recovery Mapping), long-term perspective



Planned Evolution (main points)

GDIS:

- Develop combined land- and satellite-based precipitation and SPI product
- Set-up data processing streams for global drought monitoring and forecasting (based on NMME and ECMW SEAS)
- Include other indicators (e.g., global soil moisture)
- Develop links to Regional Climate Centers
- Improve link to continental observatories

GDO:

- Improve the sectorial risk assessment and adding additional sectors (e.g. public water supply, power generation, waterborne transport, ecosystem services)
- Analyze future risk evolution
- Improve the meteorological data input
- Validate and improve meteorological drought forecasting (e.g., multi-model ensemble)
- Include an impact monitor (prototype based on EDII)



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Thank You

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