

From a North American to a Global Drought Monitor

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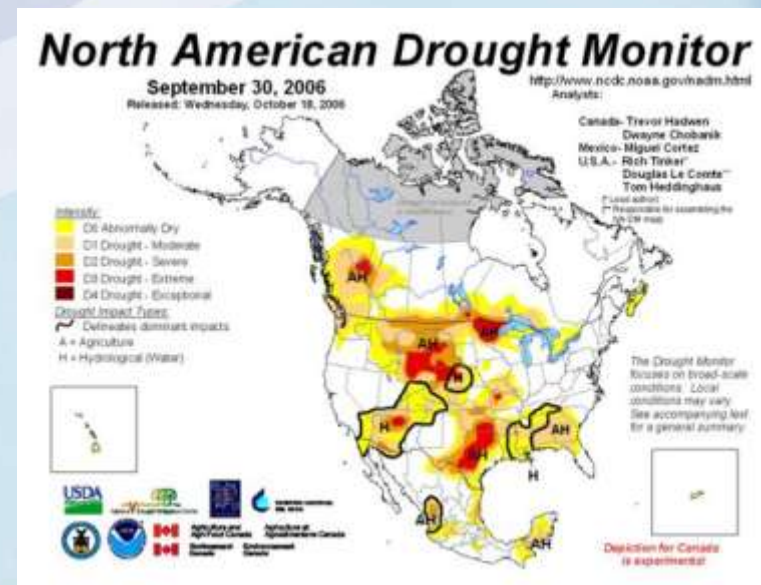
*Fifth Annual DRI Workshop
Winnipeg, Manitoba, Canada – 12-14 May 2010*



NADM Participant Responsibilities

✓ Responsibilities & Procedure

- **Each country determines drought depiction & narrative within their national boundaries**
- NADM lead authorship rotates amongst the participants
 - US: NOAA (NCDC, CPC), USDA (JAWF), NDMC
 - Canada : AAFC, MSC
 - Mexico: SMN
- NADM lead author integrates national drought assessments from each country, prepares continental monthly map & narrative
 - **Continental indicators used for international boundaries**
- All participants peer review product



<http://www.ncdc.noaa.gov/oa/climate/monitoring/drought/nadm/index.html>

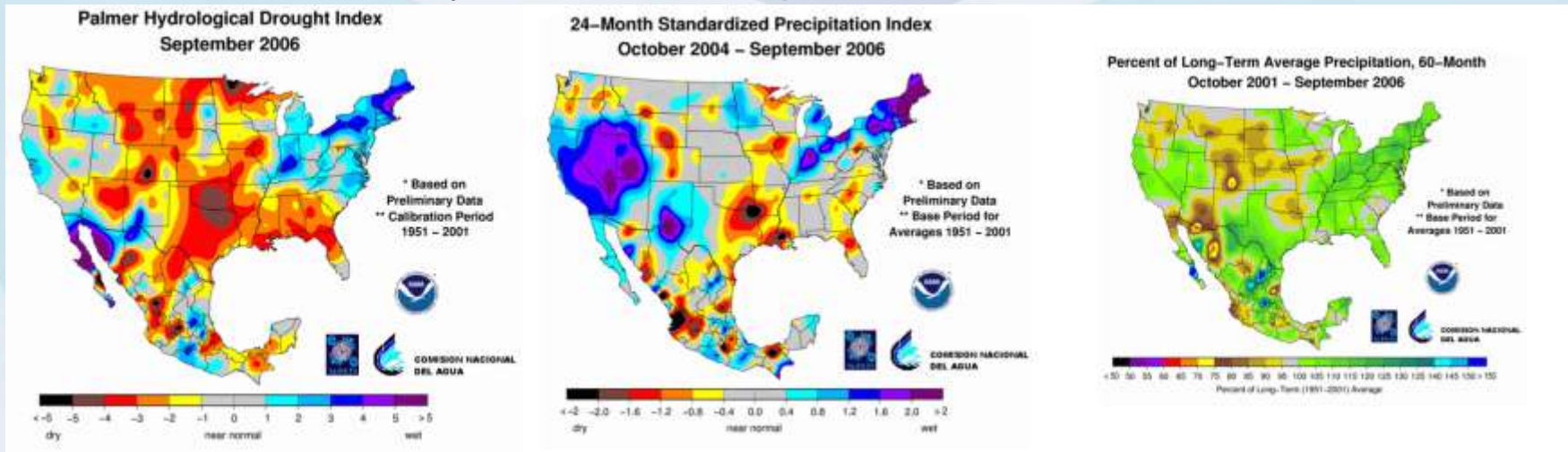


National Climatic Data Center



NADM Continental Drought Indicators

- ✓ The NADM drought conditions in US, MX, CN are determined independently based on different data, indices, & analyses within each country
- ✓ Drought indices covering entire continent are needed
 - Same indices, same analysis period, same methodologies
 - This consistency needed for depiction across international boundaries



<http://www.ncdc.noaa.gov/oa/climate/monitoring/drought/nadm/index.html>

NADM Continental Drought Indicators

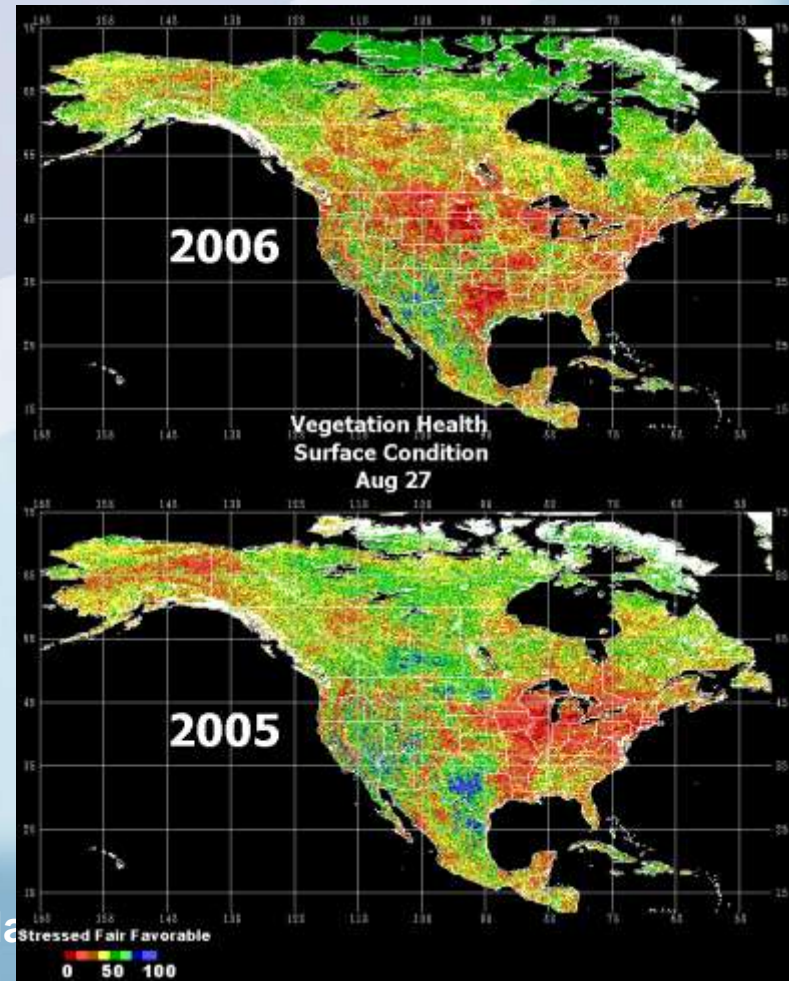
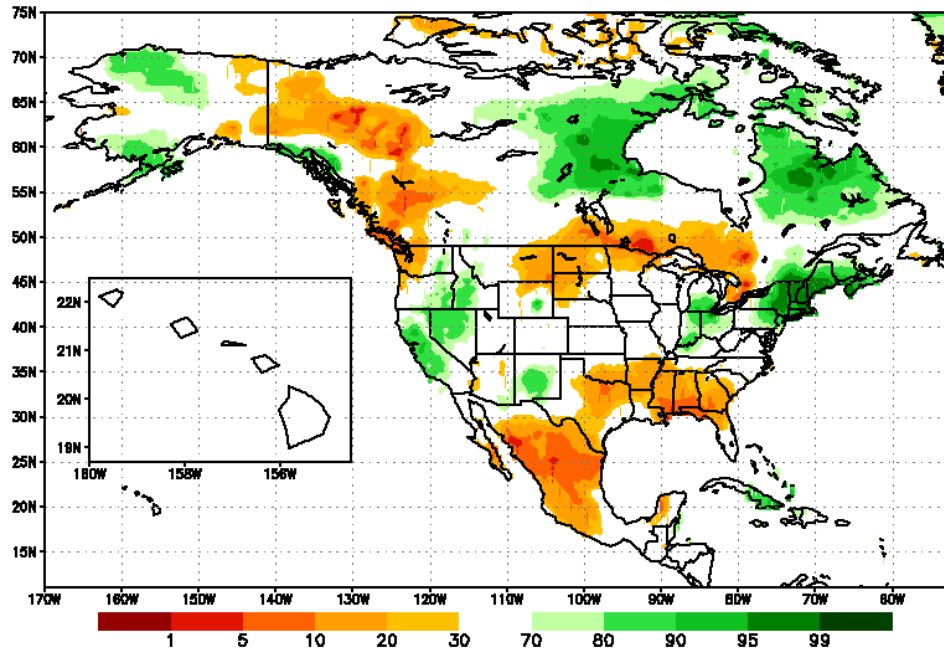
- ✓ **For Percent of Average Precipitation (PCTPCP), Standardized Precipitation Index (SPI), & Palmer Drought Indices (PDI):**
 - Period of record varies between countries and between stations within each country
 - Except p.o.r. is 1895-present for U.S. climate divisions
 - For the stations, p.o.r. generally begins in 1950 or earlier
 - Standardizing period is 1951-2001



NADM Continental Drought Indicators

- ✓ Other indicators from other sources are also used
 - NOAA/NESDIS Satellite Vegetation Health Index
 - NOAA/CPC Leaky Bucket Soil Moisture Percentiles

Calculated Soil Moisture Ranking Percentile
AUG 2006



NADM – Web Services

- ✓ NADM web site – transitioning to interactive web site with GIS web services (within NIDIS Drought Portal environment)
- ✓ NADM indicators – overlay and analysis with NADM map boundaries using various visualization tools
- ✓ NADM indicator station, divisional, and gridded (from LBPD) data in relational data base for efficient access & analysis & interoperability between various projects & applications

Station Indicator Data





Group on Earth Observations

2007 Plenary and Ministerial Summit



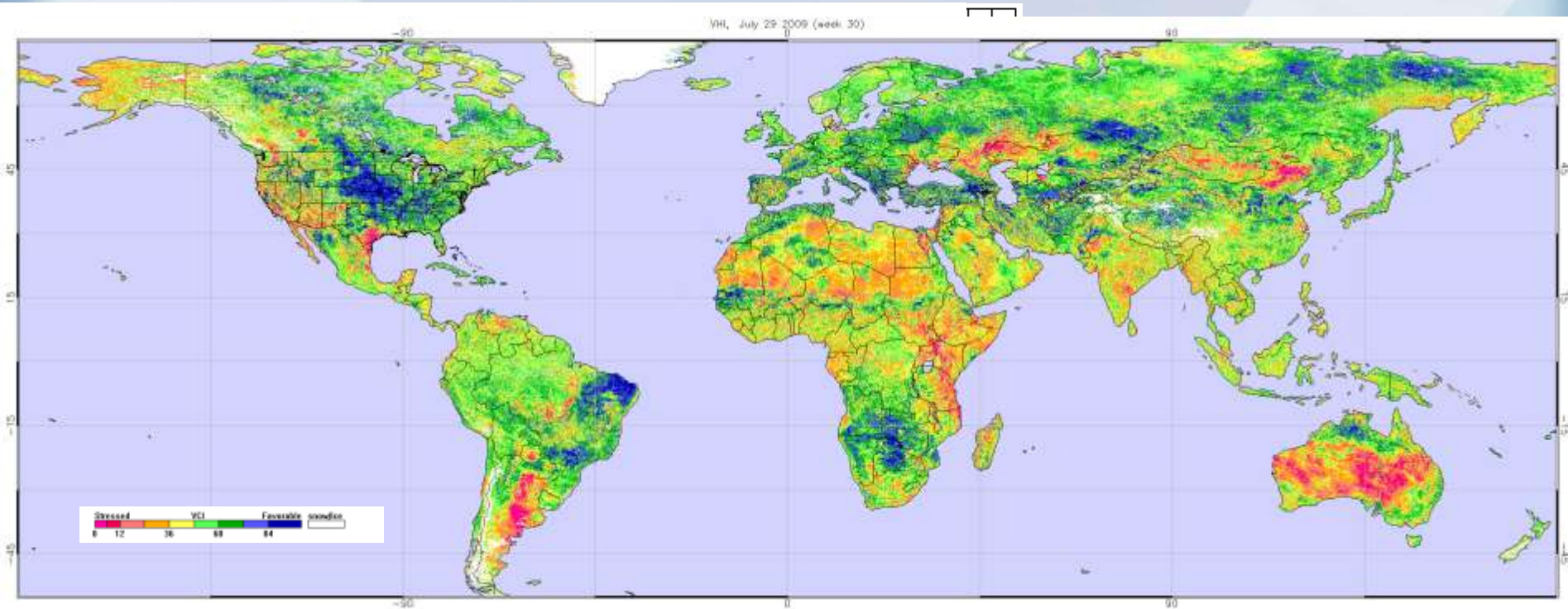
- The 4th Plenary Session and Ministerial Summit of the Group on Earth Observations was held in Cape Town, South Africa, November 2007.
- Representatives from more than 70 nations reaffirmed their commitment to working together, at both the political and technical levels, to improve the interoperability of observation, prediction and information systems towards the continued strengthening of GEOSS and the full achievement of the 10-Year Implementation Plan.
- Recognizing the growing problem of drought and its impact on long-term sustainability of Earth's water resources, the event concluded with a U.S. proposal that technical representatives from participating countries build upon existing programs to work toward establishing a **Global Drought Early Warning System** within the coming decade to provide:
 - A system of systems for data & information sharing, communication, & capacity building to take on the growing worldwide threat of drought
 - Regular drought warning assessments issued as frequently as possible with increased frequency during a crisis

How Can This Be Done?

**Is there an International
Infrastructure in Place?**



Global Models & Drought Indicators



NOAA/NESDIS Satellite Vegetation Health Index

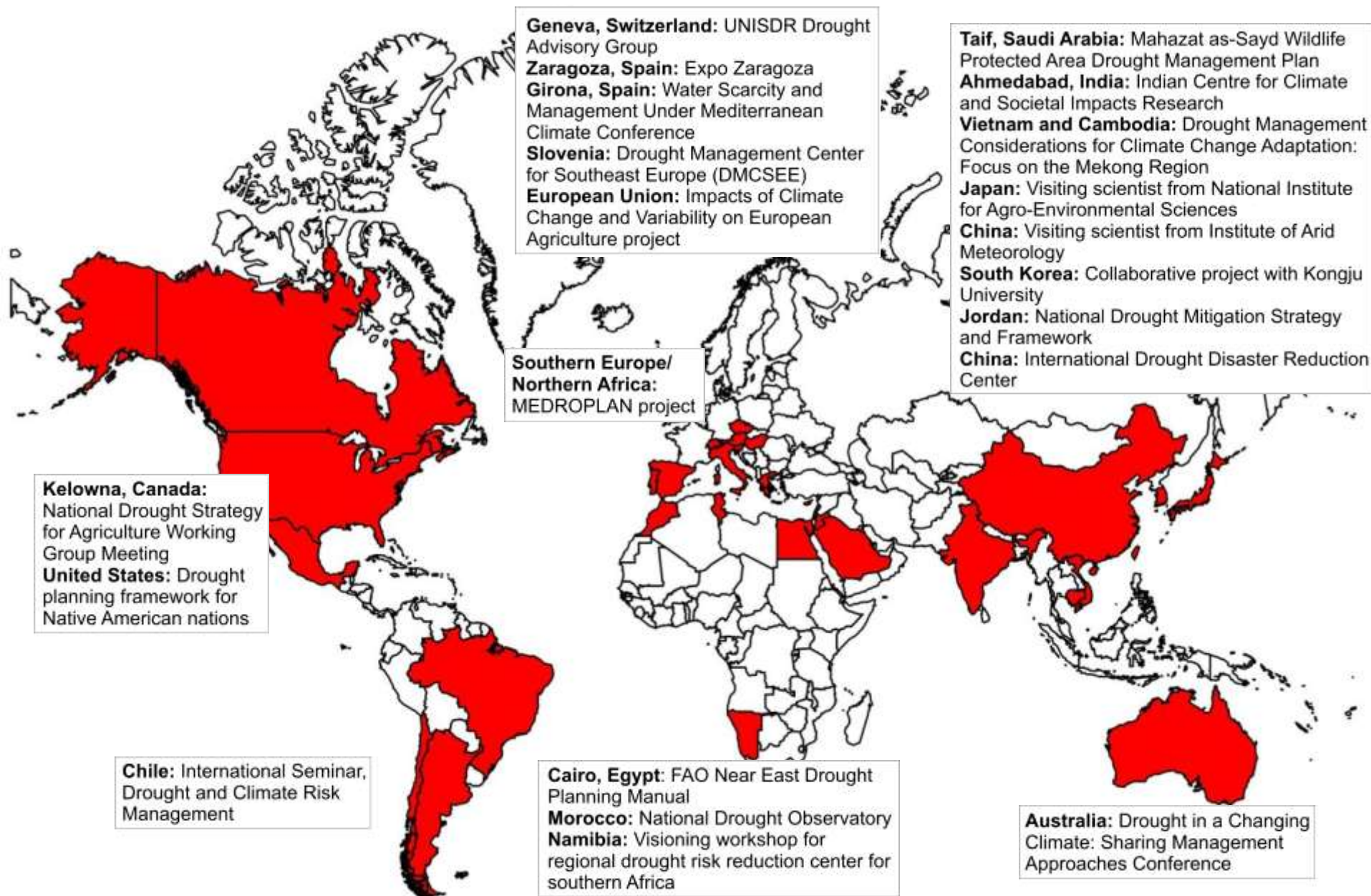
These products could be used as continental or global indicators for smoothing depictions across international borders.



**Are there any regional or
continental drought monitoring
collaborations
(beyond NADM)?**



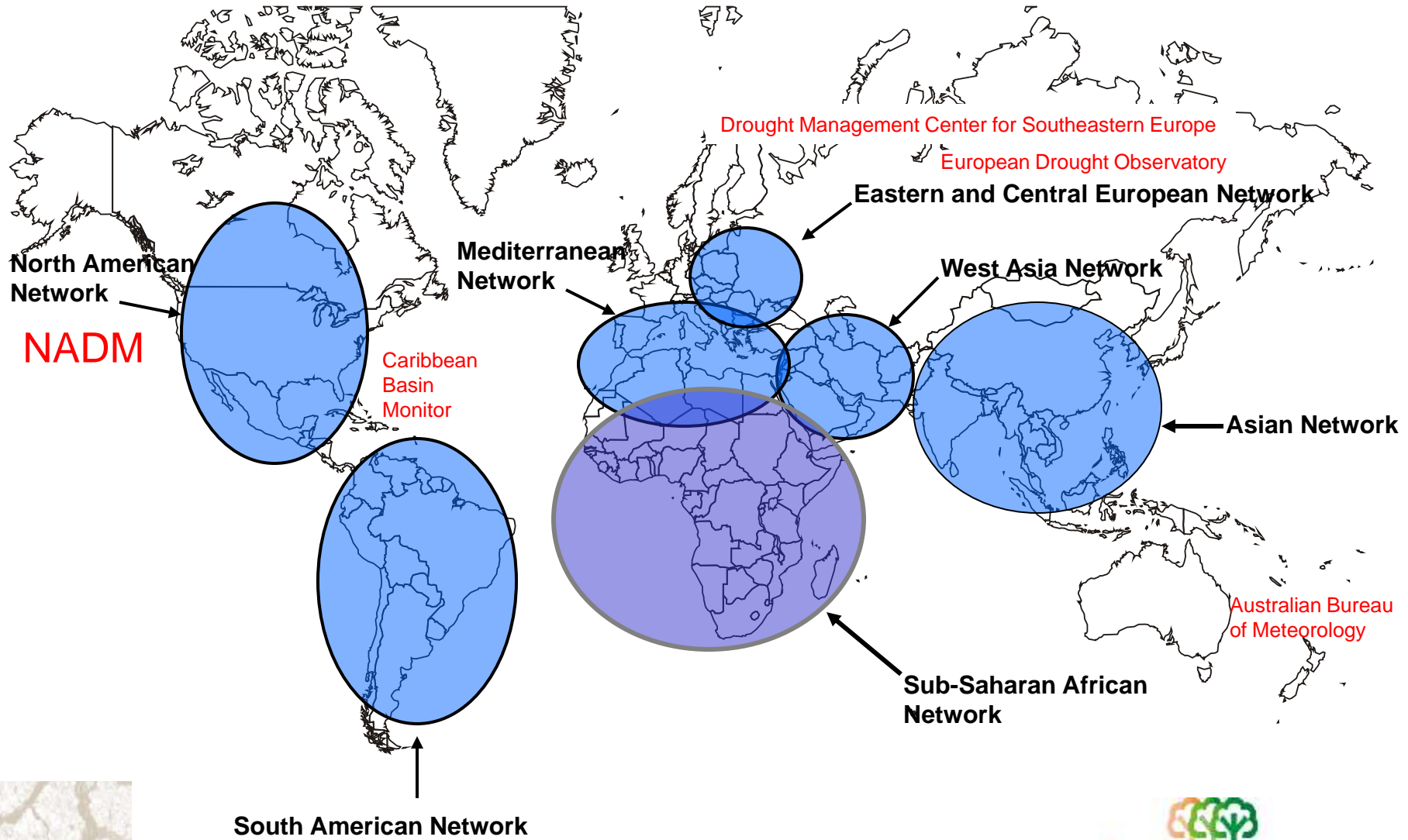
NDMC International Activities



**Workshops and research
collaborations aren't a GDEWS.**



Existing and Potential Regional Drought Monitoring Networks Could Contribute to a GDEWS



- ✓ Drought monitoring, assessment, response, mitigation, adaptation, and early warning systems have been created in a number of countries around the world, and some regional and continental efforts have been successful ...
- ✓ ... but a GDEWS remains elusive.
- ✓ Faces hurdles that include technical, data, observation network, communications, administrative, and political issues across international borders.
- ✓ How to solve these problems?
- ✓ Build a foundation first – an international Clearinghouse for drought information upon which the GDEWS could be constructed.



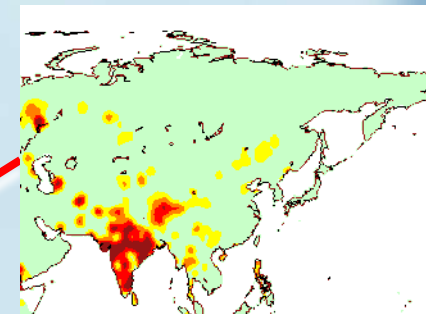
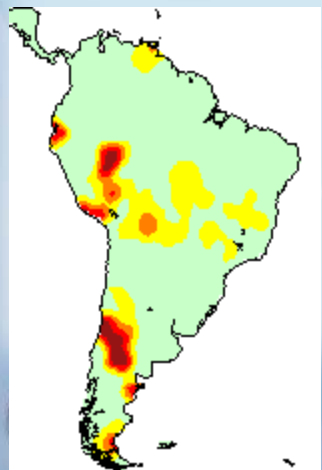
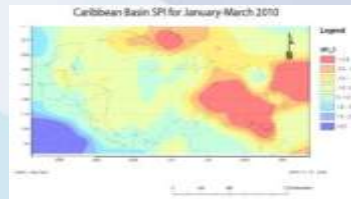
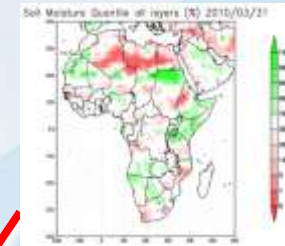
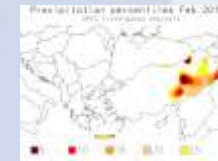
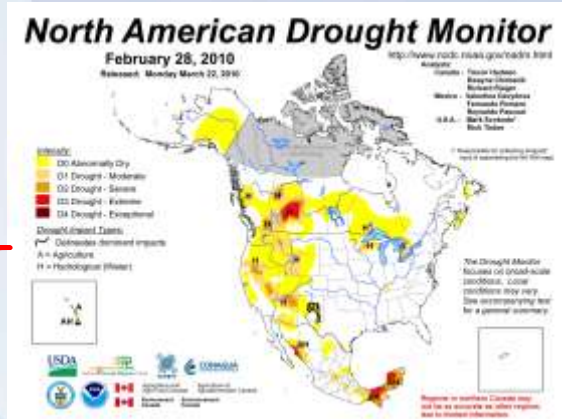
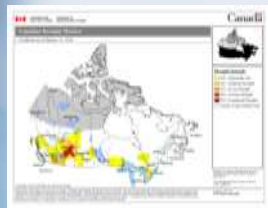
Global Drought Assessment Workshop

21-22 April 2010, Asheville, NC, USA

- ✓ Gathering of international drought experts from across the world
- ✓ Breakout groups discussed:
 - What pieces should be part of an international Clearinghouse
 - How should the Clearinghouse be housed, portrayed, and distributed
- ✓ One suggestion was to use the NIDIS Drought Portal.
- ✓ With a web-services-based Clearinghouse foundation, a GDEWS could be constructed atop it by integrating continental and regional Drought Monitors.



A GDEWS Conceptual Framework – An Integration of Continental / Regional Drought Monitors



Continental / Regional Drought Monitors

One Conceptual Framework	Level 1 (NADM Model)	Level 2	Level 3
Drought Experts	In-house expertise for monitoring, forecasting, impacts, research, planning, education	Limited in-house expertise	Rely on external expertise
National Climate Observing Network	Extensive data networks, near-real time daily observations	Limited networks (spatial density and/or timeliness)	Rely on national CLIMAT/ WWW reports and external observations (e.g., satellite obs & global models)
National Drought Assessments	National Drought Monitor already routinely produced timely (monthly or more frequently)	National assessments produced to support regional/continental monitoring	Rely on external expertise to produce national assessments
International Data Exchange	Station data exchanged for creation of regional or continental standardized indicators	Limited data exchanged internationally	Only CLIMAT or WWW data exchanged internationally
International Collaboration	National experts collaborate to create regional or continental Drought Monitor	Some national input to regional or continental Drought Monitor	Rely on external experts to produce national assessment for regional/continental Monitor
IT Infrastructure	ArcGIS, web, email	Limited ArcGIS, web, and/or email access	No IT infrastructure, rely on alternatives



Thank You!

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**North America Drought Monitor –
<http://www.ncdc.noaa.gov/oa/climate/monitoring/drought/nadm/index.html>**

U.S. Drought Monitor – <http://drought.unl.edu/dm/monitor.html>

NIDIS – <http://drought.gov/>

National Drought Mitigation Center (NDMC) – <http://drought.unl.edu/index.htm>

NOAA/NESDIS VHI – <http://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/index.php>

NOAA/NWS/CPC Leaky Bucket Model – http://www.cpc.noaa.gov/soilmst/leaky_glb.htm

University College London Global Drought Monitor – <http://climate.mssl.ucl.ac.uk/>

IRI Global SPI – <http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/SPI.html>

Caribbean Basin Monitor – <http://www.cimh.edu.bb/dpmonitor.htm>

Beijing Climate Center, Global Drought Monitor – <http://bcc.cma.gov.cn/en/>

European Drought Observatory – <http://edo.jrc.ec.europa.eu/php/index.php?action=view&id=2>

Drought Management Center for Southeastern Europe – <http://www.dmcsee.org/>

Southern Africa Development Community (SADC) Drought Monitoring Center – <http://www.sadc.int/dmc/>

Princeton Univ. Africa – http://hydrology.princeton.edu/~justin/research/project_global_monitor/

