

GEO-DRI Drought Monitoring May 10-11, 2010

Programme and Abstracts

Inn at the Forks
Winnipeg, Manitoba



Canadian Foundation for Climate
and Atmospheric Sciences (CFCAS)
Fondation canadienne pour les sciences
du climat et de l'atmosphère (FCSCA)



GEO GROUP ON
EARTH OBSERVATIONS

Table of Contents

<u>GEO-DRI Workshop Background and Objectives</u>	<u>1</u>
<u>GEO- DRI Workshop Agenda</u>	<u>2</u>
<u>GEO- DRI Abstracts</u>	<u>6</u>
<u>GEO- DRI Attendees</u>	<u>9</u>

GEO-DRI Drought Monitoring Workshop

May 10-11, 2010

Background and Objectives:

In its 2009-2011 work plan, the Group on Earth Observations (GEO) identified drought as a major activity within the Water Societal Benefit Area. A number of groups from different countries proposed actions they could take in support of the GEOSS (Global Earth Observing System of Systems) that would build drought monitoring and assessment capabilities, and would enable vulnerable countries to manage the drought risk more effectively. However, many of these activities are progressing independently from each other and without converging toward a contribution to GEOSS. This workshop, which is being hosted by the Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) and its Drought Research Initiative (DRI), will improve the coordination of these activities and help to ensure that the latest research from the Drought Research Initiative and similar efforts are having a beneficial impact on the GEO drought activities.

Objectives of the GEO-DRI workshop are:

- 1) To review the activities that are being undertaken within GEO related to drought, drought impacts, drought monitoring and drought prediction.
- 2) To identify the information needs for drought information for the purposes of monitoring, prediction and impact assessment.
- 3) To review the results of relevant drought research that could contribute to the GEO drought objectives.
- 4) To develop an action plan for GEO drought activities that would encourage the convergence of GEO drought projects and related drought research and operational activities towards one or more component(s) of GEOSS.

GEO-DRI Drought Monitoring Workshop Agenda

(Note: This workshop will be followed by the 5th Annual DRI Workshop on May 12 to 14, 2010 at the same venue. All participants are invited to stay and participate in this second workshop)

Monday, May 10, 2010:

08:00 - 08:30: Registration and Breakfast (Ballroom Foyer)

0830 – 10:30: Session #1

Welcomes, Introduction to Manitoba and Overviews of GEO and DRI (Ballroom West)

08:30 – 08:45: Welcomes and Introductions

08:45 – 09:00: Introduction to DRI (Ron Stewart)

09:00 – 09:15: Introduction to GEO Water and IGWCO activities (Rick Lawford)

09:15 – 09:30: Introduction to Canadian GEO (Ken Korporal)

09:30 – 09:45: Discussion

09:45 – 10:15: Break

10:15 – 1200: Session #2

Presentations of the specific drought-related tasks under the GEO Work Plan Task WA-06-02 (Ballroom West)

10:15 – 10:30: Introduction to GEO (Douglas Cripe by telephone)

10:30 – 10:45: WMO drought activities (Bob Stefanski (WMO) by telephone)

10:45 – 11:00: An overview of WA06-02B: Drought monitoring (Rick Lawford)

11:00 – 11:15: WA-06-02D: Drought testbeds – the NIDIS example (Richard Heim)

11:15 – 11:30: Canada/ US GEO testbeds and drought studies (Ken Korporal, Richard Heim)

11:30 – 12:00: Discussion on the potential for integration among the tasks and the steps which could be taken.

12:00 – 13:00: Lunch (Ballroom West)

13:00 – 15:40: Session #3

Realized and Potential Contributions of Drought Research Programmes and Projects (Ballroom West)

13:00 – 13:15: Drought in Southeast Asia (Orn-Uma Polpanich)

13:15 – 13:30: The US NIDIS Project (Richard Heim)

13:30 – 13:45: Drought in Europe: The Portuguese Condition (Corina Carranca)

13:45 – 14:00: Overview of drought impacts and water management in northern Mexico (Andrea Munoz Hernandez)

14:00 – 14:30: The Global Water System Project and Drought (Holm Voigt/
Charles Vorosmarty)
14:30 – 14:45: Drought and Extremes Research Projects in WCRP and their
possible contributions to GEO (Ron Stewart)
14:45 – 15:00: Discussion

15:00 – 15:30: Break (Ballroom West Foyer)

15:30 - 17:30: Session #4

**Drought and the GEO Architecture Implementation Pilot (AIP)
Demonstration Project: Using advance information systems to serve users
needs (Ballroom West)**

15:30 – 15:45: The GEO AIP activity and its contribution to GEO (Will Pozzi by
telephone)
15:45 – 16:00: The DRI Data Legacy (Phil Harder)
16:00 – 16:15: The DAI System (Patrice Constanza)
16:15 – 16:30: The NOAA-NASA GOES-R Program and its contributions to
GEOSS AIP-3 (Genong Yu)
16:30 – 16:45: The AAFC information system and products and how Canadian
users apply these products (Trevor Hadwen)
16:45 – 17:00: The NCDC data and information systems and products and how
US users apply these products (Richard Heim)
17:00 – 17:30: Discussion on steps required for a full AIP Demonstration of
drought information systems

18:00 – 20:00 Reception (Ballroom West Foyer)

Tuesday, May 11, 2010:

08:30 – 10:30: Session #5

**Drought Monitoring: Measurement and Information Systems (Ballroom
West)**

08:30 – 08:50: The Development of an International Drought Clearinghouse and
Summary of the April 2010 Asheville, NC Drought Workshops (Richard Heim)
08:50 – 09:10: Canadian and North American drought monitoring (Trevor
Hadwen)
09:10 – 09:30: The use of VIC soil moisture in drought monitoring in Canada and
China (Lei Wen)
09:30 – 09:45: GRACE measurements and drought monitoring (Ken Snelgrove)
09:45 – 10:00: Monitoring groundwater and soil moisture with observation wells
(Garth van der Kamp)
10:00 – 10:15: JECAM and related soil moisture research (Grant Wiseman)
10:15 – 10:30: Environment Canada's Soil Moisture Mesonet and CanEx-SM10
(Al Pietroniro)

10:30 – 11:00: Break

11:00 – 12:15: Session #6

Monitoring Drought Impacts (Ballroom West)

11:00 – 11:15: Impact Monitoring as the National Drought Mitigation Center (Mark Svoboda by telephone)

11:15 – 11:30: The use of multi-source information inputs to assess drought severity and impacts through the use of indicators (Charles Vorosmarty)

11:30 – 11:45: Drought impacts: Challenges in quantification and modeling (Elaine Wheaton)

11:45 – 12:00: Monitoring drought and assessing agricultural drought impacts at the provincial level – the Alberta Experience (Daniel Itenfisu)

12:00 – 12:15: Monitoring agricultural drought in Manitoba (Andy Nadler)

12:15 -13:15: Lunch (Ballroom West)

13:15-14:15: Session #6

Monitoring Drought Impacts (Continued) (Ballroom West)

13:15 – 13:30: Drought characterization studies and their implications for drought monitoring (John Hanesiak)

13:30 – 13:45: The potential for a Water Availability Index for the Canadian prairies (Kevin Shook)

13:45 – 14:00: Needs and opportunities for monitoring drought impacts in the Great Lakes (Jim Bruce)

14:00 – 14:15: Data, information and assessments needed to support the implementation of provincial drought policies and strategies (Abul Kashem)

14:15 – 15:45: Session #7

Breakout Groups to discuss contributions of drought research to GEO drought activities (Ballroom West).

14:00 – 14:15: Charge to the Breakout Groups

14:15 – 15:45: Breakout groups meet (Groups should take a break at 15:00)

- Breakout Group #1: Define the essential elements of a global drought monitoring system and outline the steps required to implement such as system (Ballroom West).
- Breakout Group #2: Define the ways in which research and operational drought activities can contribute to the Group on Earth Observations System of Systems and outline steps that could be taken to develop that contribution based on the range of existing programmes, projects and activities. (River Salon).

15:45 – 16:30: Session #8

Breakout Group Reports and Discussion (Ballroom West)

16:30 – 17:00: Session #9

General Discussion, Workshop Summary and Adjournment (Ballroom West)

GEO-DRI Drought Monitoring Workshop Abstracts

An overview of GEO Task WA-06-02B: Drought Monitoring

RICHARD LAWFORD
University of Manitoba

The Group on Earth Observations (GEO) is placing significant emphasis on the delivery of systems that can provide early warning on the occurrence and severity of natural hazards including droughts, floods and other meteorological and geological hazards. This work will become part of the Global Earth Observation System of Systems (GEOSS) a global, sustainable observational system built on the contributions of the nations of the world. In the area of drought GEO recognizes that droughts have very large economic impacts on society due to crop loss, lower water quality, water scarcity, forest fires, reduced hydropower generation, etc. Work on drought is critical for demonstrating the use and value of Earth Observations to aid society in addressing these impacts. GEO plans to develop linkages between those regions around the world that are affected by drought and will gather information on drought impacts. In particular GEO is seeking to track and analyze impacts from drought (including feedbacks such as soil drying) to provide a tangible and practical demonstration of the value of integrated water cycle observations. Part of this effort will be directed at developing a full and operational data cycle of environmental information from “producer-to-consumer”/“source to sink”. This presentation provides an overview of the efforts of GEO with a specific task related to drought impact monitoring.

The Development of an International Drought Clearinghouse and Summary of the April 2010 Asheville, NC Drought Workshops

RICHARD R. HEIM JR., MICHAEL J. BREWER, and JASON SYMONDS
NOAA/National Climatic Data Center Asheville, NC

The National Integrated Drought Information System (NIDIS) portal is a web-based information system created to address drought services and early warning in the United States, including drought monitoring, forecasting, impacts, mitigation, research, and education. The geographic scope of the NIDIS portal is being expanded with data and web services capabilities to support the North American Drought Monitor (NADM). The NADM divisional and station-based continental drought indicators will be made available for overlay and analysis with NADM map boundaries using various visualization tools. These services will be published in multiple formats, including standards-based formats to enable discoverability and interoperability in a broader context. The robust services of the NIDIS portal could serve as the foundation for an even broader international Clearinghouse for drought information. A WMO- and GEO-sponsored series of workshops being held in Asheville, North Carolina, USA in April 2010 discussed the development of an international drought Clearinghouse in the context of the creation of a global drought early warning system. The April 2010 workshops also developed recommendations, to the WMO, of specific characteristics of the

Standardized Precipitation Index (SPI), which was recommended at a WMO-sponsored workshop in December 2009 as the common meteorological drought index to be adopted by National Meteorological and Hydrological Services around the world. This paper will summarize the results of the April 2010 workshop, specifically the expanded web services and NADM applications of the NIDIS drought portal and the development of the international drought Clearinghouse.

GWSP and drought research

HOLM VOIGHT

Global Water System Project, Bonn, Germany

The talk will introduce the Global Water System Project and sum up the activities which have been conducted so far as well as giving a brief overview of current projects. As being the main link of GWSP to drought research, the core questions of the recently launched GWSP subproject; water and Migration will be presented and discussed. The starting point for this project is the question whether or not known and widely used (global) water indicators can provide new insights on the likelihood and extent of migration trajectories. In order to understand the link between water and temporal or permanent displacement of people singular events and natural hazards such as floods or Tsunamis as well as long-lasting processes like droughts need to be taken into consideration. Another challenge within this theme is the huge amount of data required accompanied by the question of how to acquire such data of sufficient quality and comparability. Thirdly the current version of the GWSP Digital Water Atlas will be discussed. Linkages to DRI as well as GEOSS might be possible

The NOAA-NASA GOES-R Program and its contributions to GEOSS AIP-3

LIPING DI¹, KEN MCDONALD², ROBIN PFISTER³ and GENONG (EUGENE) YU¹

¹George Mason University, Fairfax, Virginia

²NOAA

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The Geostationary Operational Environmental Satellite-R Series (GOES-R) program is a continuing satellite program that monitors atmospheric conditions and forecast weather. The operational GOES data have been successfully used to detect and track severe weather events using an advanced algorithm developed by Dr. John Moses at NASA GSFC. For the application of the GOES data and its derivatives, a standard Web Coverage Service (WCS) will be set up to serve these data products in a standard service. Suite of geospatial Web data services for serving NOAA and NASA Earth observation data to the GEOSS community for scenario and use case development, e.g. drought scenario of Water societal benefit area. Another contribution to the GEOSS AIP-3 effort will be the virtual service for downscaling and serving soil moisture data to desired scale of drought models through a virtual WCS service. The virtual WCS service internally incorporates a workflow of data services and data processing services.

The services and technologies will be adapted for and used in two AIP-3 scenarios: water & agricultural drought monitoring and prediction and biodiversity and climate & arctic. They will also be used in the public health-air quality and the disaster & extreme precipitation SBA scenarios. The applications in these scenarios will serve as examples for broad applications of future GOES-R products.

Monitoring drought and assessing agricultural drought impacts in Alberta

DANIEL ITENFISU

Agriculture and Rural Development, Edmonton, Alberta.

Recurrent droughts are part of Alberta's climate. These droughts have seriously impacted the agricultural industry in the province. In an effort to effectively manage drought the province have put in place a drought risk management plan- a coordinated proactive approach to reduce the effect of drought in the province. The plan identified the need for near real time drought monitoring and reporting system. Alberta Agriculture and Rural Development (ARD), in cooperation with provincial and national organization have put in place a standard near real time weather stations network consisting of 118 stations across the agricultural area in the province. Most of the stations in the network monitor air temperature, relative humidity, wind speed and direction, radiation, all season precipitation, soil temperature and soil moisture. Moreover, ARD makes use of near real time weather stations from other organization in the province as well as interpolated daily historical data.

ARD's weather data of adequate spatial and temporal density together with soil moisture and drought indices models have made possible near real time drought monitoring leading to realistic assessment of agricultural drought that reduced basis risk and enhanced the drought reporting system.

GEO-DRI Drought Monitoring Workshop Attendees

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