SOCIO-ECONOMIC BENEFITS OF METEOROLOGICAL AND HYDROLOGICAL SERVICES

INVENTORY OF DECISION SUPPORT TOOLS

ITEM	DESCRIPTION
Sector	Agriculture and Natural Resources
Sub-sector	Drought
Tool Name	North American Drought Monitor (NADM)
Tool Description	The primary goal of the North American Drought Monitor is to identify and map drought intensity areas across international borders and provide information on their impacts.
Weather, Climate or Water inputs	Various hydrological inputs needed
Specific weather, climate,water data required	Precipitation, temperatures, soil moisture, streamflow, snowpack, snow water equivalency, groundwater, reservoir levels
Spatial resolution	Varies. State/Provincial data are combined and distilled (finer resolution data are incorporated/aggregated as well) (1-100km).
Temporal resolution	Monthly
Delivery methodology	Near real-time daily, weekly, monthly data
Frequency of data requirement	Daily/weekly/monthly
Other	Continental extent
Detailed Tool Description	The North American Drought Monitor (NADM) is a cooperative arrangement between drought experts in Canada, Mexico and the United States to monitor drought across the continent on an on-going basis. The NA-DM is based on the highly successful U.S. Drought Monitor (US-DM), and as such, is being developed to provide an ongoing comprehensive and integrated assessment of drought throughout all three countries. Since its inception in 1999, the US Drought Monitor has been extremely successful in assessing and communicating the state of drought in the U.S. on a weekly basis. As with the US Drought Monitor, the North America Drought Monitor blends science and art. There is no one 'correct' way to measure drought. Drought indices are used to detect and measure droughts, but different indices measure drought in different ways, and no single index works under all circumstances. So the Drought Monitor concept was developed (jointly by the National Weather Service, the National Drought Mitigation Center and the US Department of Agriculture's Joint Agricultural Weather Center in the late 1990s) as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state and academic scientists. It was designed to heighten awareness of drought through a single product by labelling drought by intensity from D1-D4 with D1 being the least intense and D4 being the most intense. An Abnormally Dry (D0) category is used to show drought watch areas that may be drying out and potentially heading into drought as well as for those areas recovering and coming out of drought. The map also breaks out and defines areas of longer-term hydrological (H) and shorter-term

	agricultural (A) impacts. Drought intensity categories are based on 5-7 key indicators and numerous supplemental indicators based on regional and seasonal characteristics. A ranking percentile methodology is applied in order to break down the intensity categories historically with D0=30, D1=20, D2=10, D3=5, and D4=2 percentile classes respectively. The various indicators, data/products, and impact information for the NADM comes from a variety of on-line sources.
Spatial resolution	State, regional, national
Temporal resolution	Monthly
Delivery methodology	Web-based with Arc IMS GIS architecture
Frequency of provision	Provide monthly map and accompanying narrative via the Internet.
Other	
Benefits of tool application	In cooperation with their partners, NOAA's National Climatic Data Center developed the NADM in response to the need for an international drought monitoring product for North America. Defining drought and its impacts are inherently hard to quantify, therefore, there had not been a comprehensive and integrated methodology for quantifying drought across international borders in North America. Improved information on drought early warning, severity, spatial extent and impacts has proven to help policy and decision makers identify where drought is occurring and what types of impacts are being reported. Drought monitoring also plays a critical role in drought planning, preparedness and mitigation efforts at the local, watershed, state/provincial and national levels. Although all three countries have active climate and drought monitoring programs, but until recently there had been only limited cooperation and coordination between the countries' drought experts. Past drought assessments typically have stopped at each country's borders as differences in resources and policy objectives as well as differing methods for monitoring drought in each country effectively prevented an integrated view of drought conditions across the continent. The NA-DM program is being designed to overcome these past limitations with the objective of providing operational assessments of drought across the continent later in 2003, when the monthly operational DM maps and discussions will be available to the general public. Major US participants in the NA-DM program include NOAA's National Climatic Data Center, NOAA's Climate Prediction Center, the U.S. Department of Agriculture, and the National Drought Mitigation Center. Major participants in Canada and Mexico include Agriculture and Agrifood Canada, the Meteorological Service of Canada, and the National Meteorological Service of Mexico (SMN - Servicio Meteorologico Nacional).
Possible future advances	In the future, the team may work to provide more frequent delivery of the NADM as more real-time data become available and logistics are coordinated between Canada, Mexico and the United States. The intent is to continue working toward developing and incorporating more user friendly features to the existing NADM including the ability to drill down/zoom to finer regional and state level resolutions. The NADM could become a model for other regions/countries of the world to take from in creating a Global Drought Portal. The U.S. is in the process of creating a new National Integrated Drought Information System (NIDIS) drought portal that will be housed and maintained by NOAA's NCDC at http://www.drought.gov. NOAA's Climate Program is spearheading this effort with cooperation from virtually every

	government agency dealing with drought along with various local, state, regional and national non-governmental entities including the National Drought Mitigation Center.
Comments	
URL	http://www.ncdc.noaa.gov/oa/climate/monitoring/drought/nadm/index.html
Others??	http://drought.unl.edu http://www.usda.gov/oce/weather/ http://www.cpc.ncep.noaa.gov/ http://www.ncdc.noaa.gov http://www.noaa.gov/index.html http://smn.cna.gob.mx/ http://www.cna.gob.mx/eCNA/Espaniol/Directorio/Default.aspx http://www.agr.gc.ca/pfra/drought/default.htm