Governor's Conference on Managing Drought & Climate Risk

Colorado State Drought Mitigation & Response Plan

Presented by Dick Wolfe
Director/State Engineer
Colorado Division of Water Resources

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COLORADO DIVISION OF WATER RESOURCES
DEPARTMENT OF NATURAL RESOURCES

www.water.state.co.us

What is Drought?

Glossary of Meteorology:

"a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance."

("Meteorological Drought")

What is Drought?

However…

- Drought is not merely a physical phenomenon or natural event.
- Drought impacts result from:
  - the natural event (less precipitation than expected resulting from climatic variability)
  - various demands people place on water supply

What is Drought?

As a result, mitigation and response efforts require a more diverse consideration of drought

- Meteorological drought
- Agricultural drought
- Hydrologic drought
- Socioeconomic drought

What is Drought?

Example: Drought of 2002+

- Meteorological drought
  - Multiple occurrences of poor snowpack
  - Limited precipitation during summer, hot, dry
- Agricultural drought
  - Increased potential evapotranspiration
  - Low soil moisture
  - Limited yield from water rights

What is Drought?

Example: Drought of 2002+

- Hydrologic drought
  - Lower water tables
  - Depleted reservoirs
  - Effects of land use

What is Drought?

Example: Drought of 2002+

- Socioeconomic drought
  - Reduced crop yields
  - Extensive wild fires around the state
  - Decreased hydroelectric power
  - More augmentation required
  - Water use restrictions imposed
  - Affects producers (cattle and others)
  - Affected tourism and recreation industries
  - Affects home and business construction

Drought response

Historical reaction to drought:

- Temporary cutbacks
- Large water projects

Drought response

Drought Mitigation and Response Plan

- Proactive
- Diverse participants
- Diverse options

Colorado State Drought Mitigation and Response Plan

- Initially completed in 1981
- Revised in 1986, 1990, and 2001 (updated in 2002 and 2007)
- Developed to provide a means to reduce the impacts of water shortages over the short or long term.

Colorado State Drought Mitigation and Response Plan

- The Plan outlines a mechanism for coordinated effort
  - Monitoring
  - Assessment
  - Mitigation
  - Response
- Federal, state, and local support

Colorado State Drought Mitigation and Response Plan

- State level
  - Water Availability Task Force (aka Drought Task Force)[1]
  - Monitor precipitation, temperature, reservoir storage, snowpack and stream levels[1]
  - Provide technical assistance to local agencies
  - Coordinate activation and implementation of the plan, distribute information to the media and the public[1]
  - Determine impacts and develop response
  - Broker regional and federal resources when appropriate

1 Direct DWR involvement

Colorado State Drought Mitigation and Response Plan

- State level
  - During the water year (Apr-Sept), the Water Availability Task Force (WATF) collects data:
    - snowpack, soil moisture, reservoir levels, stream flow, precipitation and temperatures and monitors drought forecasts and climate conditions
  - Members of the WATF, which is co-chaired by the CWCB and the DWR, share information, discuss projections, and assess the water availability situation.

Colorado State Drought Mitigation and Response Plan

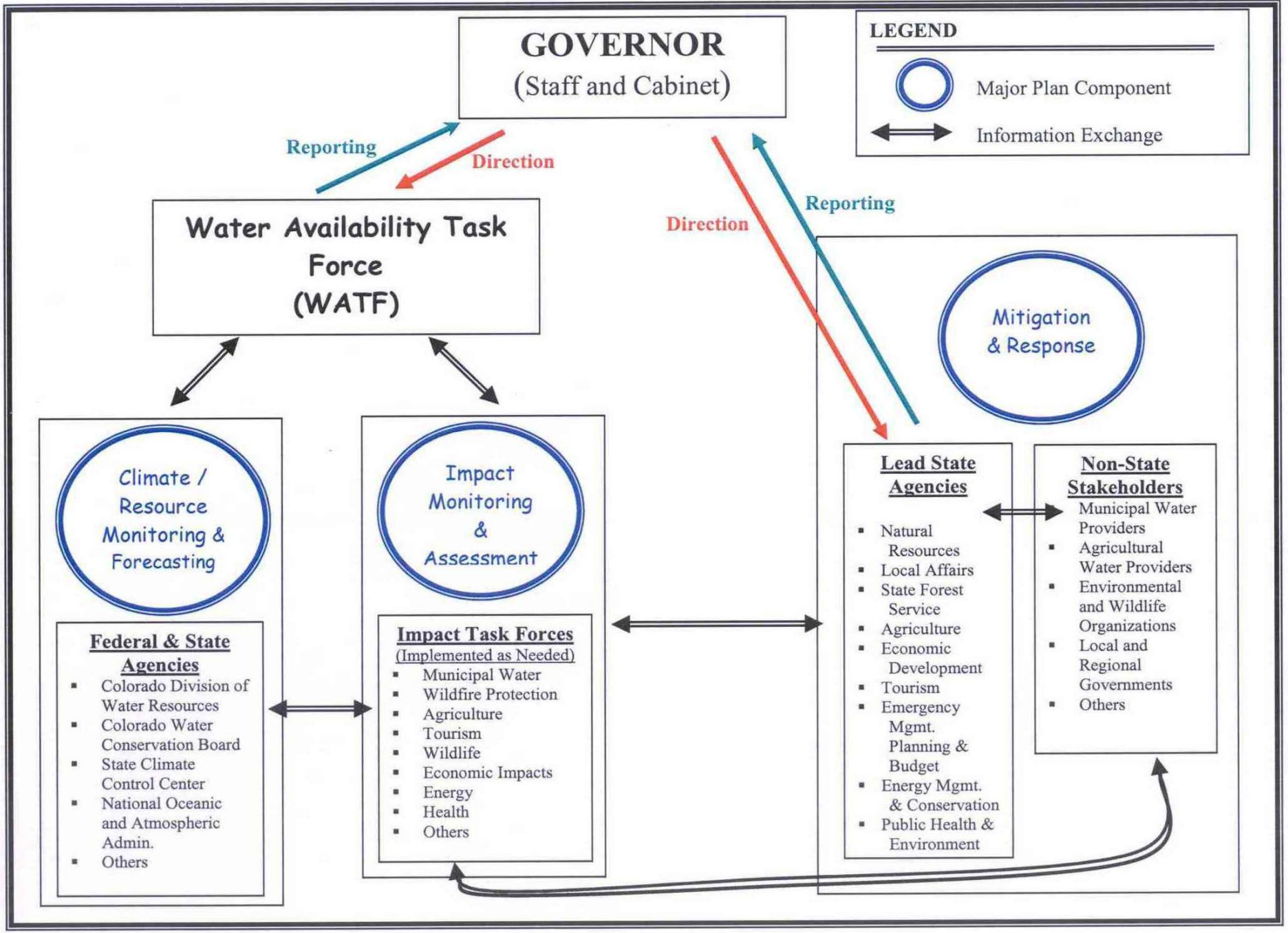
- State level
  - Chairs of the Impact Task Forces comment on any observed or potential impacts within their area of responsibility.
  - The group then recommends what actions, if any, should be taken.
  - The WATF co-chairs relay this information to the Office of the Governor, upon which, the Governor may elect to order an assessment of impacts.

Colorado State Drought Mitigation and Response Plan

- Impact Task Forces (ITFs)
  - Municipal Water
  - Wildfire Protection
  - Agricultural
  - Tourism
  - Wildlife
  - Energy
  - Health

Colorado State Drought Mitigation and Response Plan

- ITF tasks:
  - Identify drought related problems
  - Define and assess societal impacts, severity, loss and costs
  - Evaluate state and local capacity for response
  - Determine residual needs
  - Report findings and action plans


GOVERNOR
(Staff and Cabinet)
LEGEND
Major Plan Component
Information Exchange
Reporting
Direction
Direction
Reporting
Water Availability Task Force (WATF)
Mitigation & Response
Climate / Resource Monitoring & Forecasting
Impact Monitoring & Assessment
Federal & State Agencies
Colorado Division of Water Resources
Colorado Water Conservation Board
State Climate Control Center
National Oceanic and Atmospheric Admin.
Others
Impact Task Forces
(Implemented as Needed)
Municipal Water
Wildfire Protection
Agriculture
Tourism
Wildlife
Economic Impacts
Energy
Health
Others
Lead State Agencies
Natural Resources
Local Affairs
State Forest Service
Agriculture
Economic Development
Tourism
Emergency Mgmt. Planning & Budget
Energy Mgmt. & Conservation
Public Health & Environment
Non-State Stakeholders
Municipal Water Providers
Agricultural Water Providers
Environmental and Wildlife Organizations
Local and Regional Governments
Others

Colorado State Drought Mitigation and Response Plan

- Activation of Plan
  - Impact assessment (from ITFs)
  - Review & Reporting Task Force acts:
    - Review reports from WATF and the ITFs
    - Aggregate assessments and projections
    - Evaluate overall conditions
    - Develop recommendations for drought response
    - Make timely reports to leadership, the media, the response agencies, and others

Colorado State Drought Mitigation and Response Plan

- 2007 Update
  - Accomplished conformance with Disaster Mitigation Act of 2000
  - Done in accordance with FEMA guidelines
  - The update addressed:
    - Documentation of the planning process
    - Risk assessment
    - Mitigation strategy
    - Coordination of local mitigation planning
    - Plan maintenance process including monitoring progress of mitigation activities

Colorado State Drought Mitigation and Response Plan

- Proposed actions:
  - Completion of local drought plans a priority
  - Develop technical drought planning toolbox
  - Develop database to track local drought plans
  - Develop a process to integrate and link local plans to the State Drought Plan
  - Develop a Statewide Climate Change Initiative
  - Comprehensive revision of the State's Drought Mitigation & Response Plan
  - Develop a robust monitoring process
  - Public information/education efforts

Colorado State Drought Mitigation and Response Plan

- Revised plan
  - Incorporate proposed actions
  - Participatory role in the National Integrated Drought Information System (NIDIS)
  - Work with federal agencies (NOAA, USGS, Bureau of Reclamation and Western Water Assessment)

Colorado State Drought Mitigation and Response Plan

- Future
  - Two challenges will call for more resources, more collaboration and partnering, and more innovative solutions :
    - The challenge of an increasing demand from exploding growth
    - The challenge of uncertainty in the face of climate variability and climate change

Colorado State Drought Mitigation and Response Plan

A comprehensive state drought plan is critical during a time of growing population demands, uncertainty due to climate variability and climate change, and already-stressed supplies

Presented by:

Dick Wolfe, M.S., P.E.
State Engineer

(303) 866-3581 ext. 8241
dick.wolfe@state.co.us
www.water.state.co.us

Overview of the 2002 Colorado State Drought Mitigation & Response Plan, the 2007 Plan Update, and Future Plans for a Comprehensive Revision

By
Dick Wolfe, State Engineer, Director
Colorado Division of Water Resources

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Drought is most often thought of conceptually as a shortage of water associated with a deficiency of precipitation that is associated with an unsatisfied demand for water. According to the Glossary of Meteorology, drought is defined as "a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance." However, from the perspective of water administration the concept of drought is more complex and the effects can be far reaching. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. This interplay is evident in the Colorado Division of Water Resources' perspective on drought. As water users and water administrators in Colorado, we recognize the varying disciplinary perspectives of drought including meteorological, agricultural, hydrological and socioeconomic.

Our reactions to drought will be based on these types of drought, along with the operational definitions of drought including the timing, duration, area affected and degree of deficiency. In the past, we would react with severe, but temporary restrictions on use, combined with plans for large and/or expensive water projects. However, a state drought response plan allows for a comprehensive planned response that includes participation from federal, state, and local levels.

The Colorado Drought Mitigation and Response Plan (Drought Plan) was developed to provide an effective and systematic means to reduce the impacts of water shortages over the short or long term. The Drought Plan outlines a mechanism for coordinated drought monitoring, impact assessment, response to emergency drought problems, and mitigation of long term drought impacts. The Drought Plan also provides for coordinating the efforts of public and private entities to deal with drought impacts.

Colorado's initial Drought Plan was completed in 1981and was revised in 1986, 1990, and 2001 (updated in 2002). In June 2007, Colorado updated its Drought Plan in conformance with the requirements of the Disaster Mitigation Act of 2000, which requires states to conduct mitigation planning for natural disasters that may affect the state. The update was completed in accordance with revised guidelines for updates put out by FEMA. The update was **not** an attempt to rewrite Colorado's Drought Plan but rather provide information required by FEMA statute and regulation to assist the Division of Emergency Management and the CWCB with the 2007 Update of Colorado's Natural Hazard Mitigation Plan. Colorado's Drought Mitigation Goals were revised to include 2 new additional goals: 1) Develop Intergovernmental and Interagency Stakeholder Coordination; and 2) Evaluate Potential Impacts from Climate Change.

Colorado's Hazard Mitigation Plan, to which the Drought Plan is an annex, is scheduled for its triennial review and update in 2010. The CWCB and the Colorado Division of Water Resources will take the lead on this comprehensive initiative. In anticipation of this process and a more comprehensive and robust review and complete revision, in 2007 the CWCB requested in its annual Projects Bill to the Legislature, $300,000 to fund and support this revision initiative. This request was approved. The funds will be utilized to completely revise the Drought Plan and to implement as many of the proposed actions in support of the Drought Mitigation Goals established in the 2007 update.

In addition to implementing a process for revising the Drought Plan in partnership with federal and state agencies, and local governmental and water provider expertise and support, Colorado will seek a proactive participatory role in the National Integrated Drought Information System (NIDIS). NIDIS is a drought early warning system capable of fostering and supporting a research environment that focuses on impact mitigation and improved predictive capabilities. It is designed as a user-based drought information system that assesses potential drought indicators and impacts to provide tools for anticipating, preparing for, and mitigating the effects of drought. Colorado will plan to work with federal agencies including NOAA, USGS, Bureau of Reclamation and Western Water Assessment, which is the Regional Integrated Sciences and Assessments Program in the Rocky Mountain region. These partnerships will provide scientific knowledge to public and private water providers and stakeholders to anticipate, track, assess, and respond to drought threats at regional and local levels. Many of the goals and objectives of NIDIS coincide squarely with Colorado's recommended mitigation actions.

As we move into the future, two challenges will call for more resources, more collaboration and partnering, and more innovative solutions to address the societal, environmental, and economic needs for an increasingly valuable, vulnerable, and scarce water supply: 1) The challenge of an increasing demand from exploding growth, and 2) The challenge of uncertainty in the face of climate variability and climate change. It is paramount that we work together across all sectors of industry, government, and research institutions to maximize resources and opportunities to responsibly manage and use our water resources to meet these challenges. A comprehensive Drought Plan, as well as robust local drought plans, are critical tools needed to be successful in times when supplies are threatened by drought and climate change.

Professional Profile for Dick Wolfe

Dick is a native of Colorado and was raised on a farm in Weld County. He obtained his BS and MS degrees in agricultural engineering from Colorado State University. Dick was a partner with Spronk Water Engineers for seven years specializing in water resources on various water right issues in Colorado, Kansas, Arizona, and New Mexico. Dick has been with the Colorado Division of Water Resources since 1993 and is currently the State Engineer and Director.

Mr. Wolfe can be contacted at:

Dick Wolfe, M.S., P.E.
State Engineer, Director
Colorado Division of Water Resources
1313 Sherman St., Suite 818
Denver, CO 80203

Ph: 303-866-3581 ext. 8241
Fax: 303-866-3589
Email: dick.wolfe@state.co.us