 Building Drought-Resilient Montana Communities

 Guidance for a step-by-step community-based water planning process

**Introduction**

As the fourth largest U.S. state by area, Montana exhibits marked regional diversity in topography, geography, climate, precipitation, and snowpack. It contains the headwaters of three major river basins (Columbia, Missouri, South Saskatchewan) and “exports” (by way of instream flow) approximately 41 million acre feet of water per year to neighboring states and Canada. With a population of around 1 million and just 6.8 people per square mile, Montana boasts vibrant agricultural, recreation and tourism economies reliant on open space and clean, available water. Yet, increasing average temperatures, drought, earlier runoff and decreasing snowpack combined with population growth and often-conflicting water demands raise significant, site-specific water supply challenges. Water planning is a critical tool to address local, regional and statewide water issues.

**Water Planning Approaches**

Integrated Water Resource (IWR) Planning, a comprehensive form of water supply planning that considers social and environmental factors, is a proven strategy for addressing water-related issues. Although it is well-accepted conceptually, there is less agreement regarding its ideal application. For instance, IWR planning can be applied to craft specific supply and demand management strategies for a public water utility or can be more broadly applied to inform comprehensive watershed-or-basin-level water planning with multiple stakeholders.

No matter the planning “lens” (integrated water resources management, drought, flood, land use and development, emergency response, water conservation), the central principles are the same. All water planning approaches rest upon sound water supply management while balancing socio-economic needs with ecosystem health and sustainability. Essential components of all water-related plans include:

* Public health
* Consideration of the natural floodplain, its water storage capacity, and effects of development
* Monitoring and assessing water supply and water quality indicators
* Forecasting and preparing for water supply shortage or excess
* Community involvement and education

**The National Drought Resilience Partnership (NDRP) Montana Demonstration Project**

National interest continues to grow around building community resilience to drought. The National Drought Resilience Partnership (NDRP) is a coordinated effort involving various federal agencies working together to build long-term drought resilience nationwide. The effort recognizes the need for a two-pronged approach to battling drought involving both *response* and *long-term adaptation*. The NDRP to build long-term drought resilience nationwide formed in response to directives in President Obama’s 2013 Climate Action Plan.

The NDRP selected Montana’s Upper Missouri River Headwaters Basin as the sole drought resilience demonstration project in the nation. Currently, watershed coordinators in eight watersheds in the demonstration basin are engaging their communities through a similar step-by-step water supply planning process that will build community drought resilience. This novel and groundbreaking planning demonstration heavily emphasizes *the planning process* rather than the creation of standardized drought plansor similar required outcomes.

Project leaders with the MT Department of Natural Resources and Conservation (DNRC) and the Environmental Protection Agency (EPA) are channeling federal, state, local and private resources in the form of technical and financial support to communities. The approach involves a “train the trainer” mantra, resting on the pivotal foundation that drought resilience must grow from the ground up. The drought planning process relies upon robust community involvement and leadership at every step, and specifies when outside support is needed, such as during drought monitoring and impact assessment stages.

**Building Drought Resilient Communities**

This outline provides a basic framework Montana communities can use for water supply planning with a focus on drought. Using this step-by-step process, local leaders can develop a systematic, watershed-specific approach to engaging stakeholders and leading drought resilience planning in their communities.

Most importantly, through participation as stakeholders in this planning framework, Montana citizens will be better poised to understand water-related challenges, identify potential water-related vulnerabilities and impacts in their communities, and prioritize and invest in both response and adaptation strategies.

The Montana Department of Natural Resources and Conservation (DNRC) developed this practical planning process based upon the core elements identified in the Bureau of Reclamation (BOR) Drought Contingency Planning. The BOR recommends the following elements:

* Drought monitoring
* Vulnerability and impact assessments
* Mitigation actions
* Response actions
* Operational and administrative framework
* Plan update process

The DNRC Building Drought Resilient Montana Communitiesframework incorporates the above elements and integrates other related natural resource (land, water, emergency) plans in a comprehensive community-based planning process. This approach is meant to guide watershed leaders in building long term drought resilience in their communities. The outline includes the following steps detailed below:

**Step 1: Engage the community**

**Step 2: Understand water, climate and drought in the community**

**Step 3: Identify drought impacts and vulnerabilities**

**Step 4: Develop a response plan**

**Step 5: Identify and prioritize long-term adaptation actions**

**Step 6: Monitor, communicate and educate**

## planning framework for Building Drought Resilient Communities

**Getting started**

This first step in the process is to provide a community overview of the drought planning process, describe the benefits of developing a drought plan and outline the core elements. Watershed leaders will be able to answer the big picture questions below, such as “Why plan for drought?”. This step also lays out possible methods for engaging the community in the planning process, identifying key stakeholders, evaluating linkages to other planning documents and identifying the **operational and administrative** framework for drought response.

**Step 1: Engage the community**

* Identify key stakeholders (Who should be included?)
* Reach out to stakeholders (Gage interest and knowledge)
* Link drought planning to other groups and plans

**Big Picture questions to consider**

* Why develop a drought plan?
* How will we recognize the next drought in the early stages?
* How does drought affect us? (this is key for identifying vulnerabilities in Step 3)
* How can we protect ourselves from the next drought?
* What are the core elements of a drought plan?
* Who does what, when, where after a drought occurs?

**Step 2: Understand Water, Climate and Drought in the Community**

This step focuses on identifying and become familiar with common drought indicators such as snowpack, streamflow, soil moisture, and precipitation. Using monitoring tools, watershed leaders can hone in on what data to collect, how to synthesize information to understand water supply trends and historic local drought conditions, and what monitoring needs persist in the watershed. Step 2 provides the basis for **drought assessment and monitoring** and may require several meetings, outside research, and consultation with outside technical experts.

**Begin to compile information on:**

**Existing watershed characteristics**

* Hydrology, size, topography, major rivers and streams, reservoirs, economics, growth, etc.

**Water Supply, demand and drought indicators**

* History of drought in the watershed
* Current and past snowpack, streamflow, soil moisture, precipitation, weather, temperature, etc.
* Major water uses
* Other relevant information
* Tools and framework to synthesize the data/information pertinent to your watershed

**Step 3: Identify Vulnerabilities and Impacts**

Identifying drought vulnerabilities is a key step in the drought planning process. Participants in the planning process will help identify vulnerabilities and the associated impacts in their watershed. This may require several meetings to focus on drought impacts in each water use sector such as recreation, agriculture, recreation, tourism, etc.

**Step 4: Develop a Response Plan**

Once outside research and stakeholder conversations identify vulnerabilities, step four focuses on different ways to prioritize vulnerabilities and develop response actions for different water use sectors. This is an iterative process and may result in response actions for some geographic areas or water use sectors and not others. A community may also choose to first identify and undertake drought adaptation projects (Step 5).

**Prioritize vulnerabilities**

Develop a prioritization process (identify rating criteria and process for community involvement).

**Response strategies**

Identify and develop triggers; additional drought indicators

Collect case studies and work plan ideas/examples

**Step 5: Identify and Prioritize Long-term Adaptation Actions**

**Develop adaptation strategies to increase water supply security *before* the next drought.**

Identify specific projects

Identify responsible parties, cost estimates, funding opportunities, timelines, etc.

Implement projects

**Step 6: Monitor, Communicate & Educate**

Successful drought plans rely heavily on community investment in the development process. This step should focus on methods and tools for engaging the community in monitoring, communicating the benefits of a drought plan to the community and outlining other approaches for engaging the community in **drought plan updates.**

* Monitor climatic and water supply conditions
* Provide climate, drought and water supply status updates regularly
* Maintain communication and outreach in the community on activities
* Monitor and track mitigation projects and their successes or lessons learned
* Review and update the drought plan annually, especially the response plans