What's new in the Climate Toolbox?

Katherine Hegewisch
University of California Merced

RISA Regional Integrated Sciences and Assessments

CIRC Climate Impacts Research Consortium
A NOAA RISA TEAM

NIDIS

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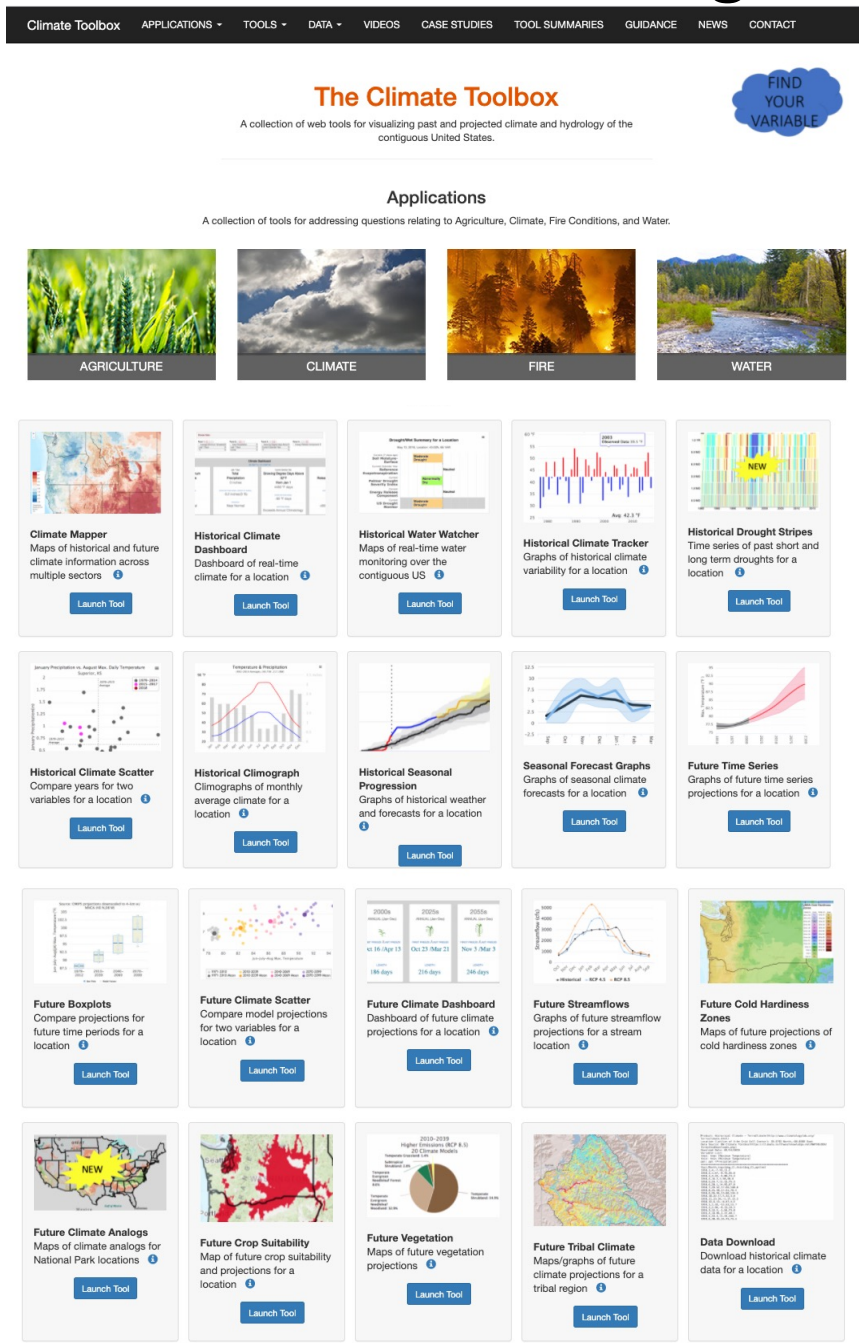

What’s new in the Climate Toolbox?

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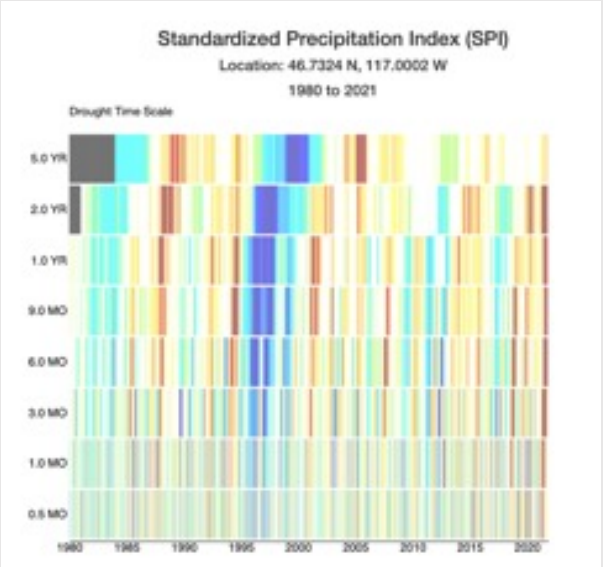

Future Climate Analogs Tool

Case Study Series

Climate Toolbox Case Study

DROUGHT & WATER MONITORING

MAKING AN IMPACT

Drought Declarations in Washington State

State drought declarations allow irrigation districts, cities and other governmental organizations, and Tribes to receive state assistance before they feel the impacts of water shortages. Examples of such assistance include:

- State funding
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In Washington, a drought emergency is declared when the water supply is less than 75 percent of normal and there is potential for undue hardship.

MEET JEFF

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Water supply data relevant to drought monitoring include:

- Precipitation
- Mountain snowpack
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- Streamflow
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Current and forecasted water supply data are needed to inform Washington’s planning for drought response.

USING THE TOOLBOX

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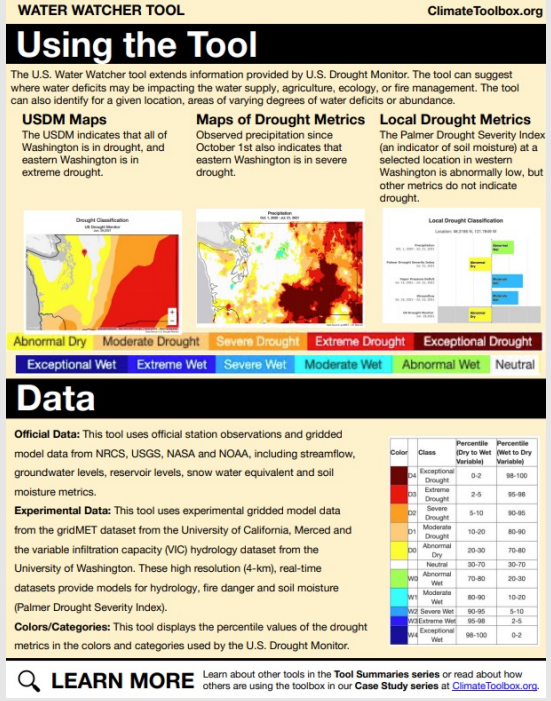
ClimateToolbox.org

Tool Summary Series



WATER WATCHER TOOL — ClimateToolbox.org

Using the Tool

The U.S. Water Watcher tool extends information provided by U.S. Drought Monitor. The tool can suggest where water deficits may be impacting the water supply, agriculture, ecology, or fire management. The tool can also identify for a given location, areas of varying degrees of water deficits or abundance.

USDM Maps
The USDM indicates that all of Washington is in drought, and eastern Washington is in extreme drought.

Maps of Drought Metrics
Observed precipitation since October 1st also indicates that eastern Washington is in severe drought.

Local Drought Metrics
The Palmer Drought Severity Index (an indicator of soil moisture) at a selected location in western Washington is abnormally low, but other metrics do not indicate drought.

Abnormal Dry | Moderate Drought | Severe Drought | Extreme Drought | Exceptional Drought

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Data

Official Data: This tool uses official station observations and gridded model data from NRCS, USGS, NASA and NOAA, including streamflow, groundwater levels, reservoir levels, snow water equivalent and soil moisture metrics.

Experimental Data: This tool uses experimental gridded model data from the gridMET dataset from the University of California, Merced and the variable infiltration capacity (VIC) hydrology dataset from the University of Washington. These high resolution (4-km), real-time datasets provide models for hydrology, fire danger and soil moisture (Palmer Drought Severity Index).

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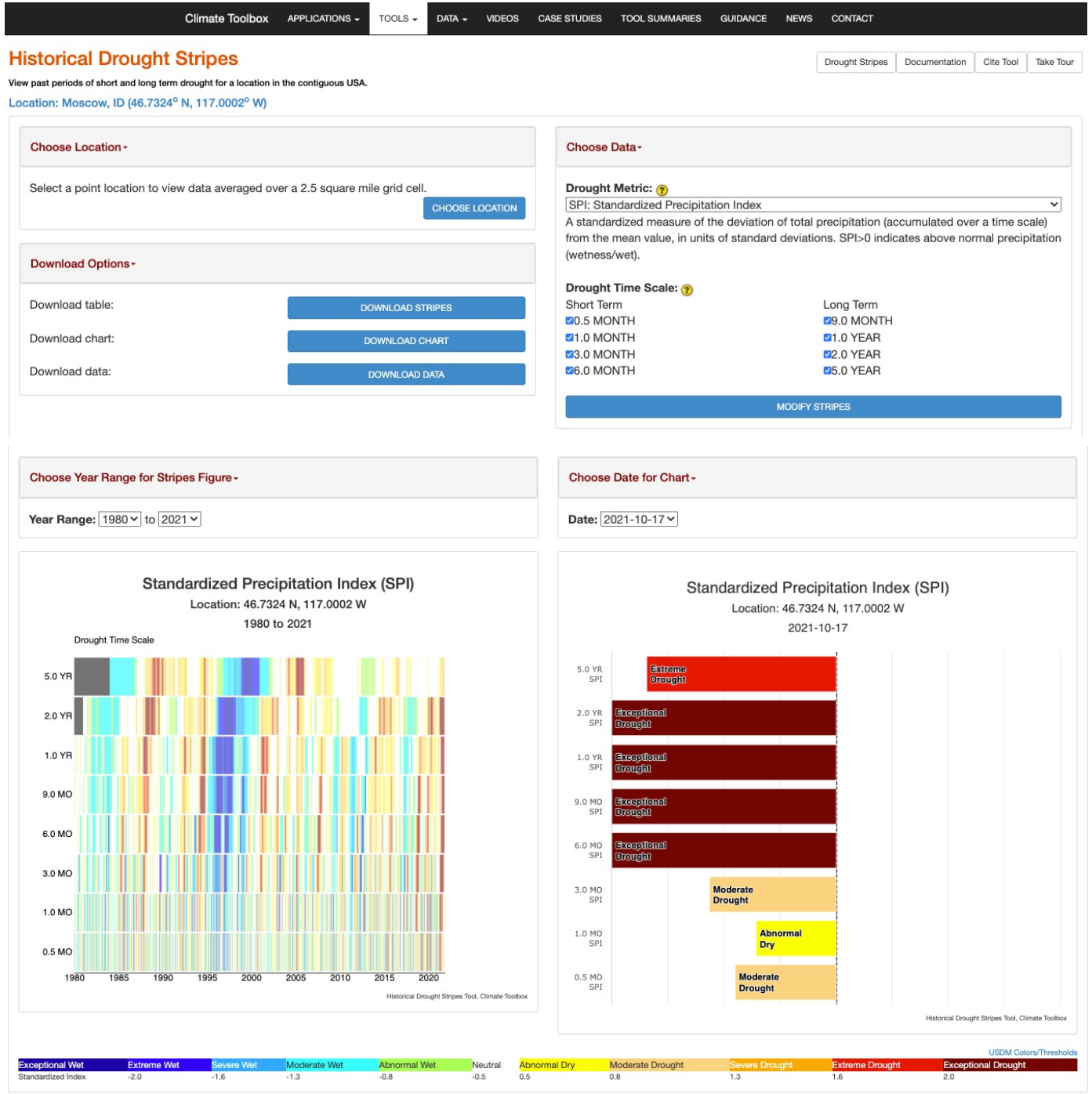
LEARN MORE Learn about other tools in the **Tool Summaries series** or read about how others are using the toolbox in our **Case Study series** at ClimateToolbox.org.

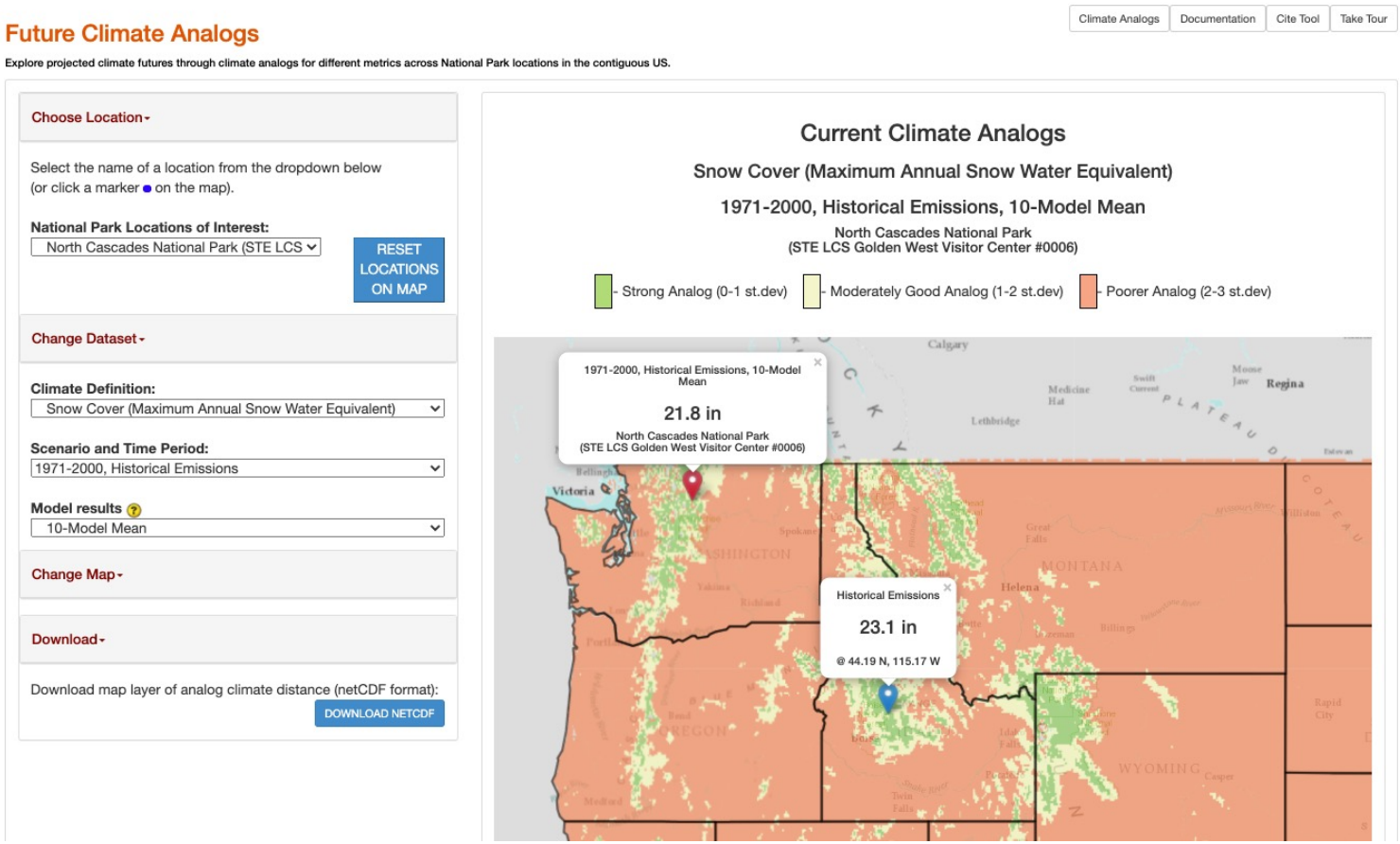
Drought Stripes Tool

- Timeseries of wet & dry periods
- Different types of drought
- Short & long term times scales
- Same thresholds/colors as USDM



Future Climate Analogs Tool

- Where the climate of National Park locations is projected to be similar in the future
- Current and future analogs
- Different climate definitions
  - temperature, water, agriculture, fire danger, energy



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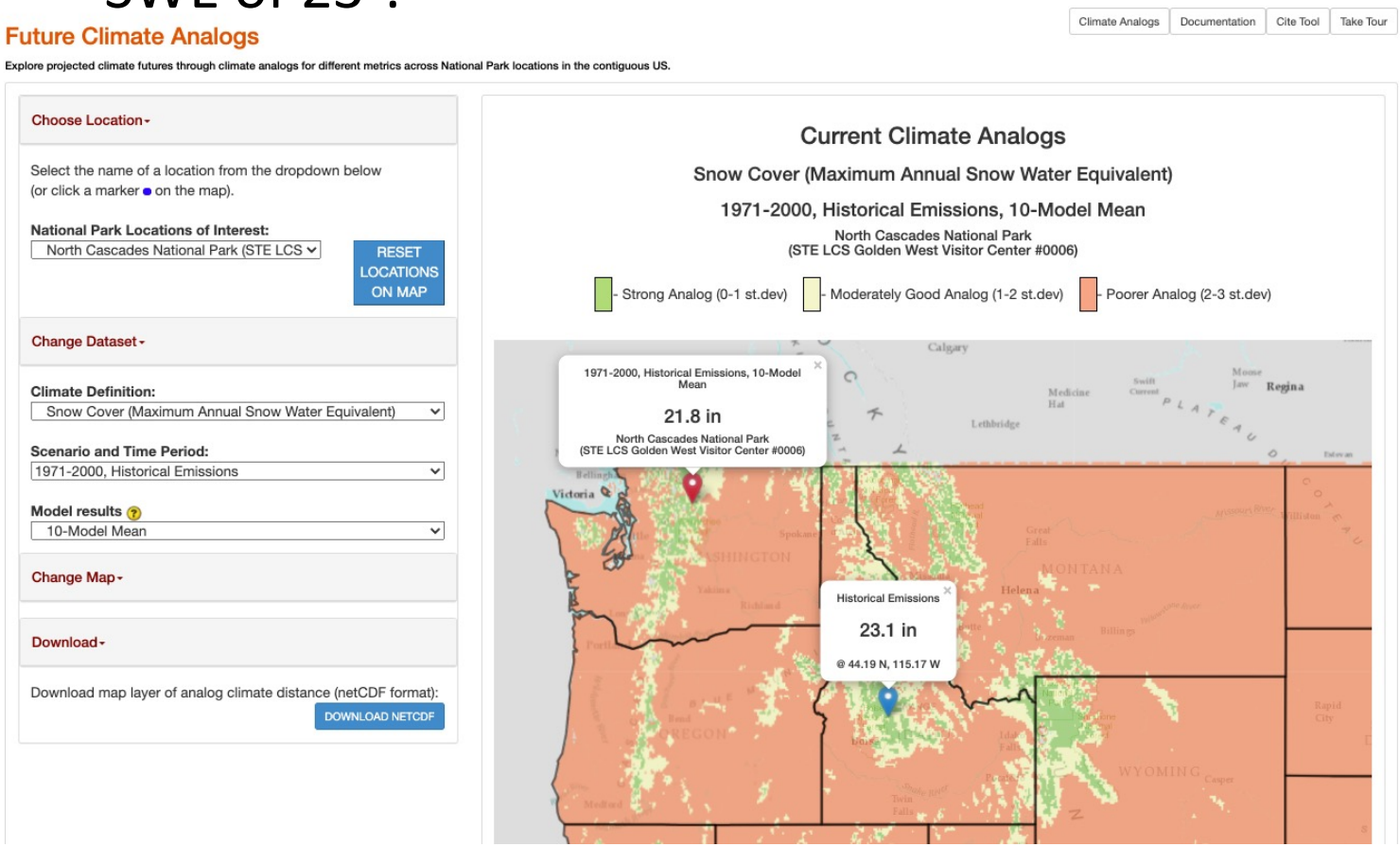
Future Climate Analogs Tool

A current snow cover analog for North Cascades National Park is in the Sawtooth Mountains of Idaho with maximum annual SWE of 23”.



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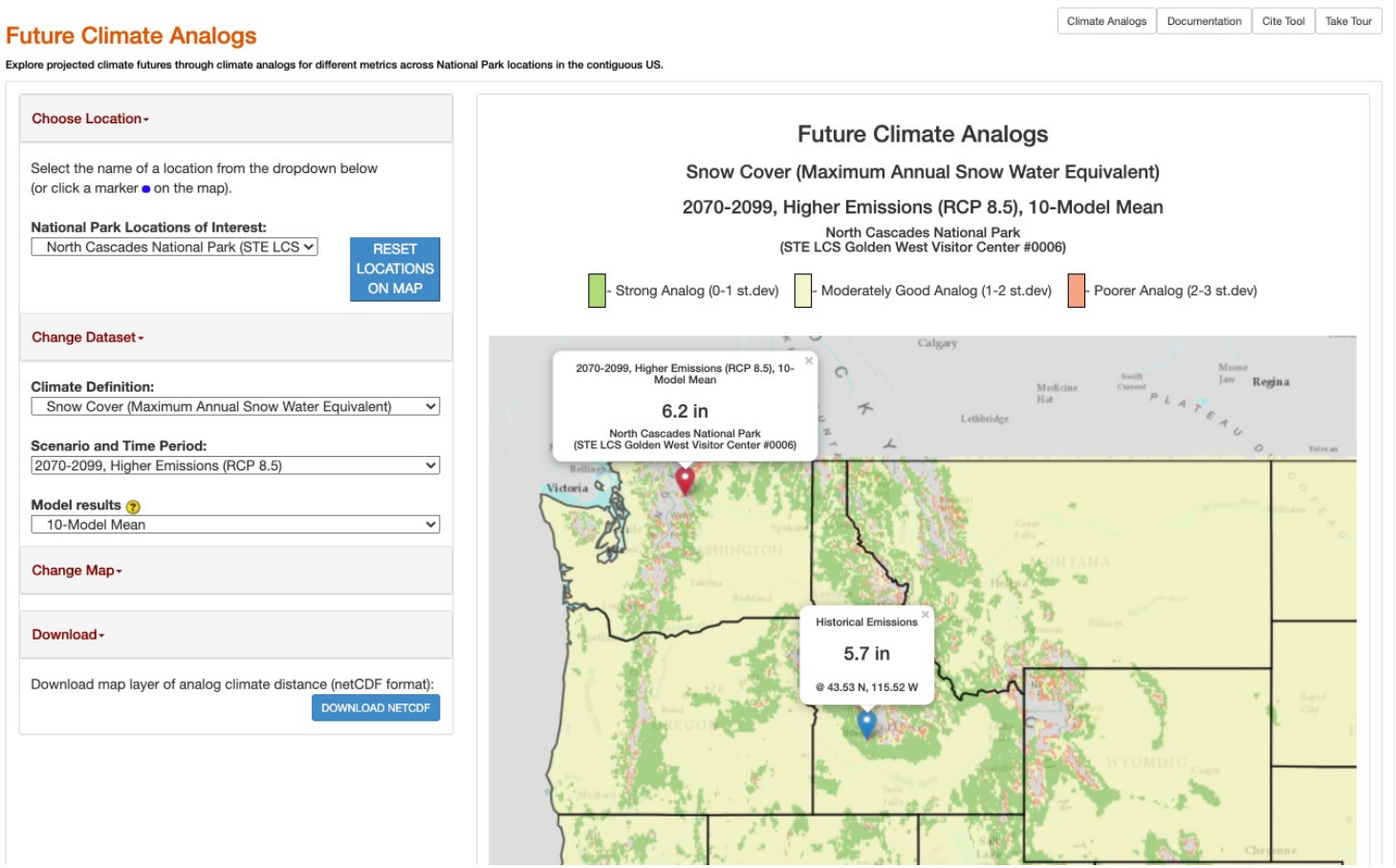
Future Climate Analogs Tool

By the 2080s under High Emission scenario, analogs move to lower elevations with an analog near Boise, ID of 5.7” max annual SWE.



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Case Study Series

Six Case Studies:

- Drought & Water Monitoring
- Fire Danger
- Agriculture
- Species Assessments
- University Education
- Community Engagement

Drought & Water Monitoring

Jeff Marti

Climate Toolbox Case Study

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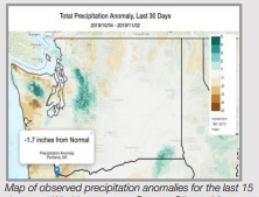
DROUGHT & WATER MONITORING ClimateToolbox.org

HOW THE TOOLS ARE USED

Monitoring Current Water Supply

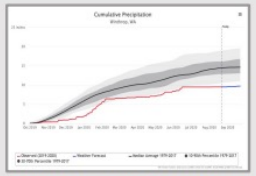
- **Anomalies**—Jeff is interested in comparing current year precipitation to that during past years with anomalies (differences from normal). He needs to know whether the current year is above or below normal and by how much.
- **Anomaly maps**—Jeff selects the anomaly variables in the Climate Mapper tool to locate areas with the greatest difference from average. These areas may experience the greatest hardship.



Map of observed precipitation anomalies for the last 15 days over Washington state. Source: Climate Mapper tool.

Assessing Drought Potential

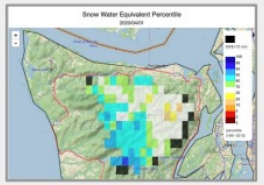
- **Monitoring accumulations**—Jeff looks at total precipitation since Oct. 1st (start of water year) as a first indication of the state of the water supply.
- **Tracking trends**—Jeff checks the Seasonal Progression tool throughout the water year to evaluate whether water supplies are trending toward a drought.
- **Viewing forecasts**—Jeff uses forecast data to estimate the likelihood that water supplies will rebound from an apparent drought.



Graph of cumulative precipitation from Oct. 1, 2019 (red line) in Winthrop, WA, showing well below normal conditions (black line). Source: Seasonal Progression tool.

HOW THE TOOLBOX IS USEFUL

- **Menus**—Menu selections allow one to toggle easily between observations and forecasts.
- **Navigation**—Users can zoom in and out on maps to examine areas of interest.
- **Geographic coverage**—The gridded data is available for any location in the contiguous U.S.
- **Data processing**—Rapid data processing allows users to view information within county and watershed boundaries almost instantly.



A map of snow water equivalent over the Olympic Peninsula, WA showing gridded data coverage. Source: Climate Mapper tool.

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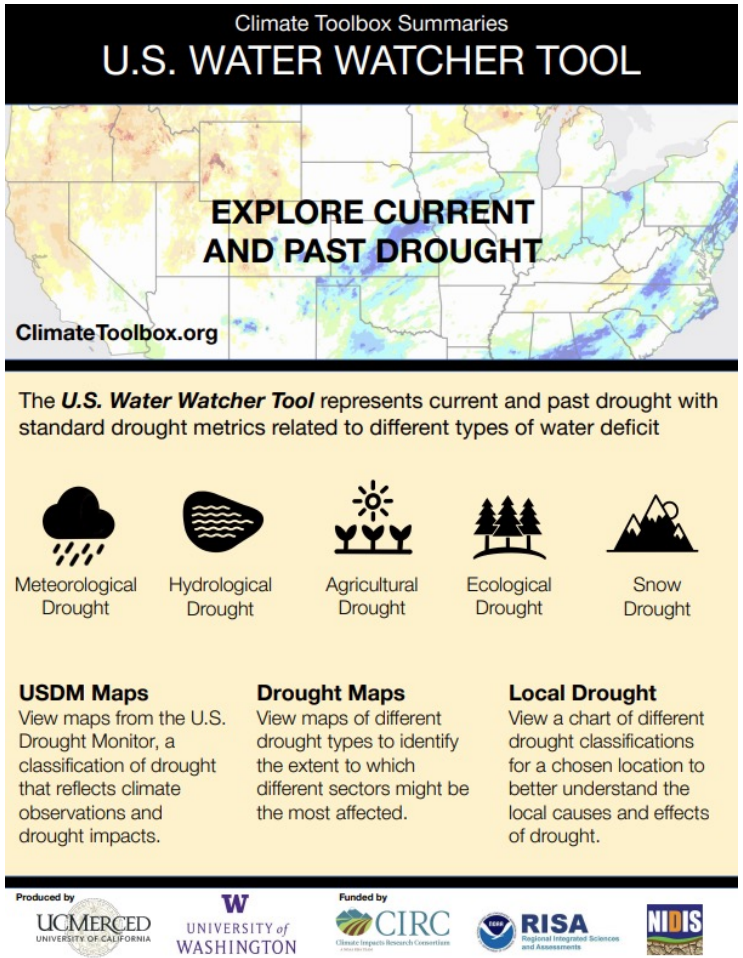
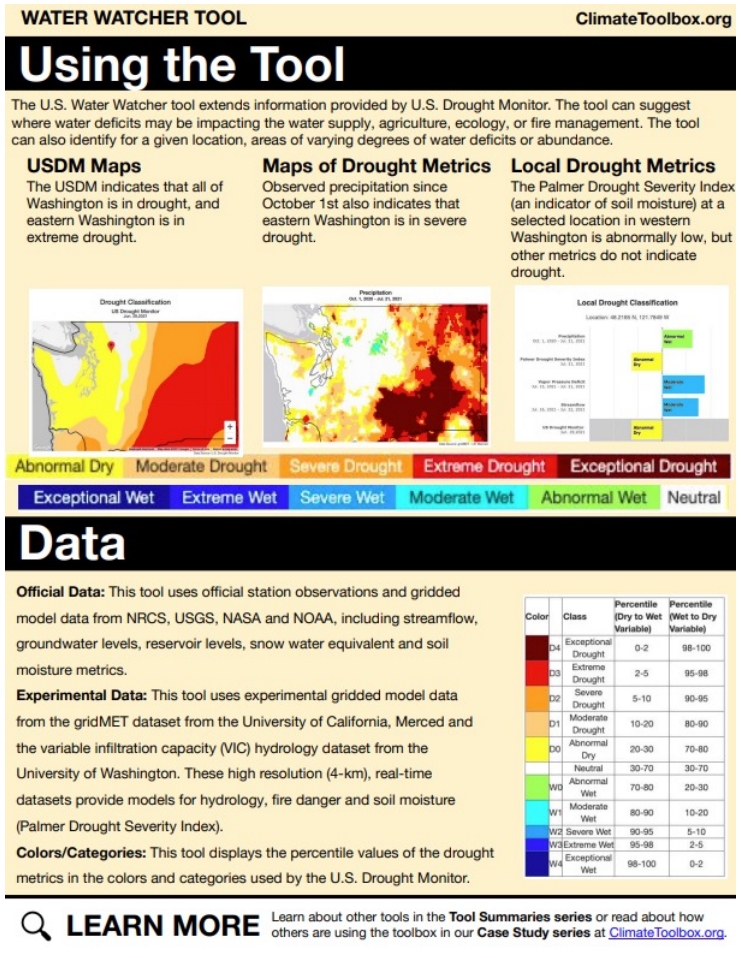
Tool Summary Series

Seven Tool Overviews:

- US Water Watcher Tool
- Drought Stripes Tool
- Future Crop Suitability Tool
- Future Vegetation Tool
- Tribal Climate Tool
- Climate Analogs Tool

US Water Watcher Tool





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Climate Toolbox | APPLICATIONS | TOOLS | DATA | VIDEOS | CASE STUDIES | TOOL SUMMARIES | GUIDANCE | NEWS | CONTACT

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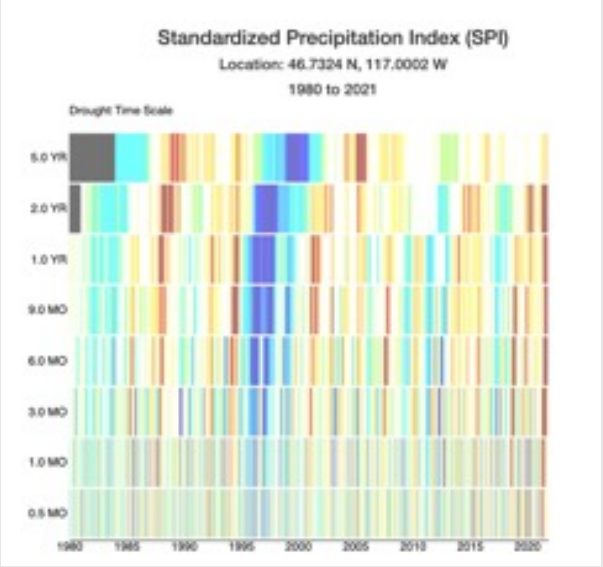

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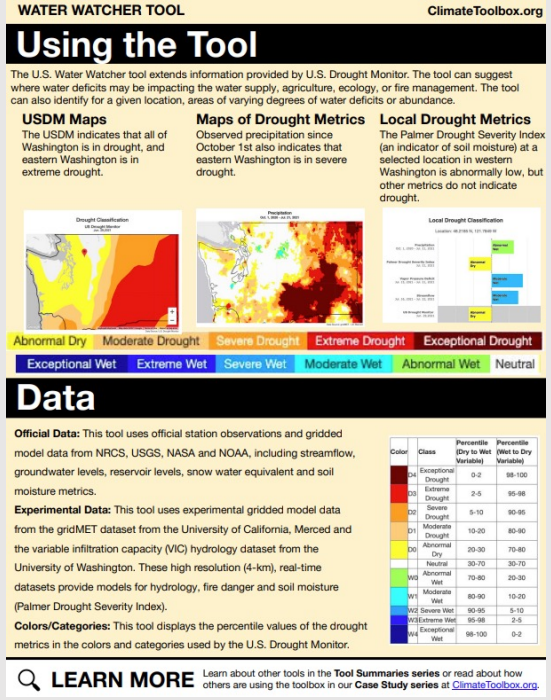

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Coming Soon!

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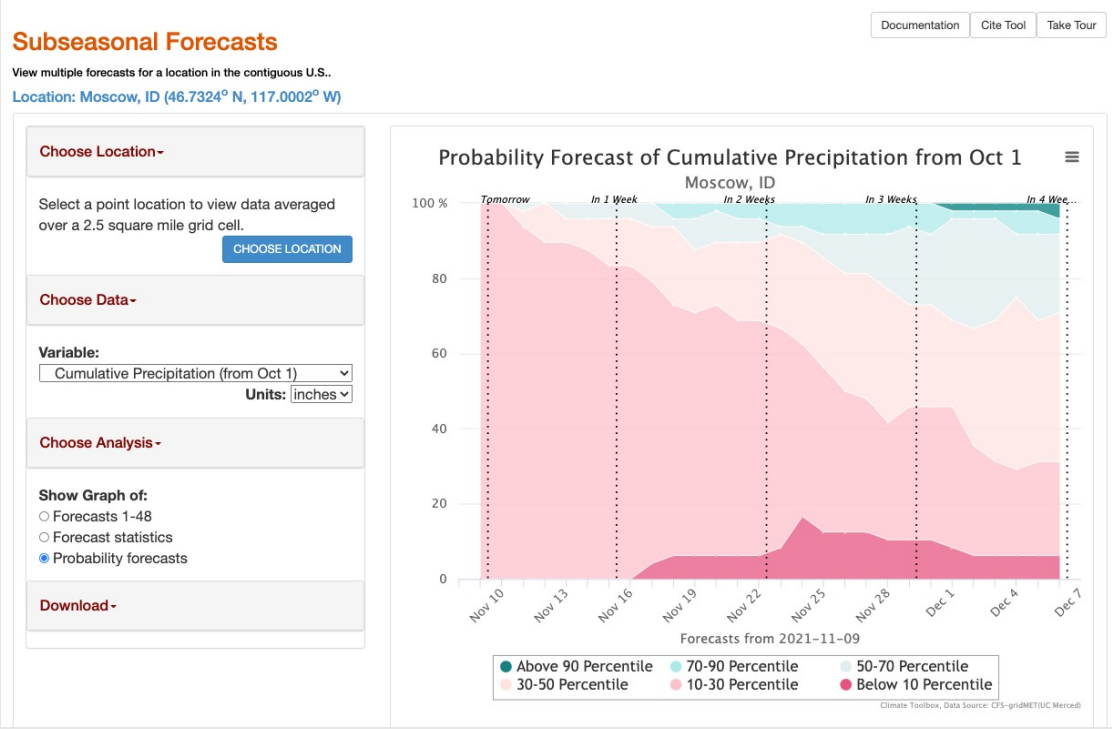
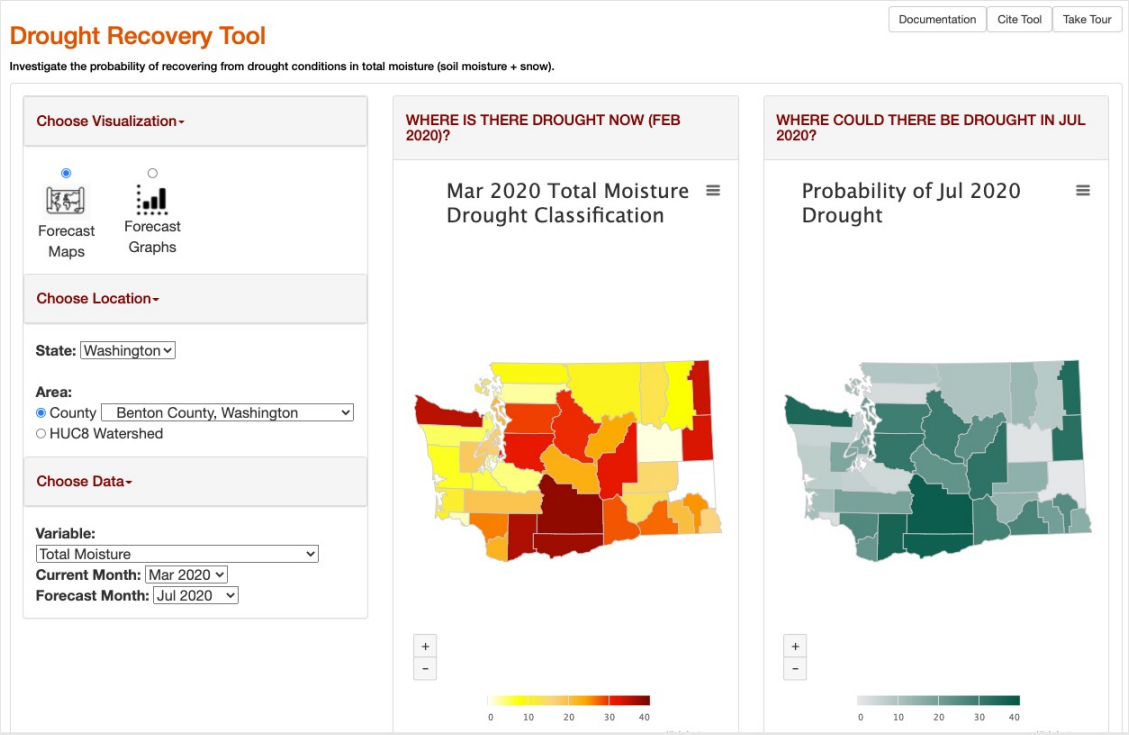
Drought Recovery Tool