Climate Framework Implementation Team (FIT) Update

Oregon Framework Spring Forum 2023

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NACSE

PRISM CLIMATE GROUP

RMA

Introduction

- **Dylan Keon – Climate FIT Lead**
  - Assistant Professor (Research) – OSU College of Engineering
  - NACSE Associate Director
  - Involved in Oregon GIS since around 1998
  - MS in plant ecology + GIS/statistics; PhD in computational geography

- **Chris Daly – former Climate FIT Lead**
  - Professor (Research) – OSU College of Engineering
  - NACSE Chief Scientist
  - Creator of the PRISM model

- **Today:** **(1) NACSE/PRISM background and current projects**
  (2) Climate FIT status and involvement

What is NACSE?

- Northwest Alliance for Computational Science & Engineering
  - In the Oregon State University College of Engineering
  - Faculty & staff from multiple schools
  - Fully grant-funded
- Founded in 1995 as OSU's first interdisciplinary research center
- Specializes in
  - Decision support tools
  - Weather and climate research ← *how we FIT in* ☺
  - Spatial analysis
  - Modeling and visualization

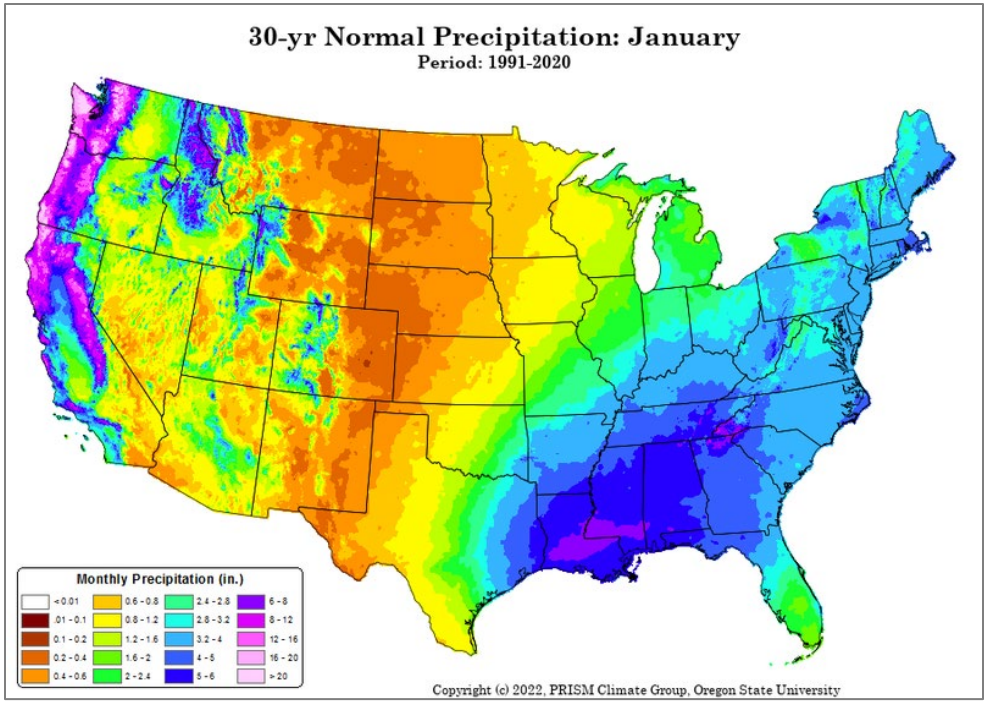
What is PRISM?

- Parameter-elevation Regressions on Independent Slopes Model
- PRISM estimates weather and climate variables, such as temperature and precipitation, for a grid of millions of pixels over the entire conterminous US, every day

Weather maps show what occurs from day to day.

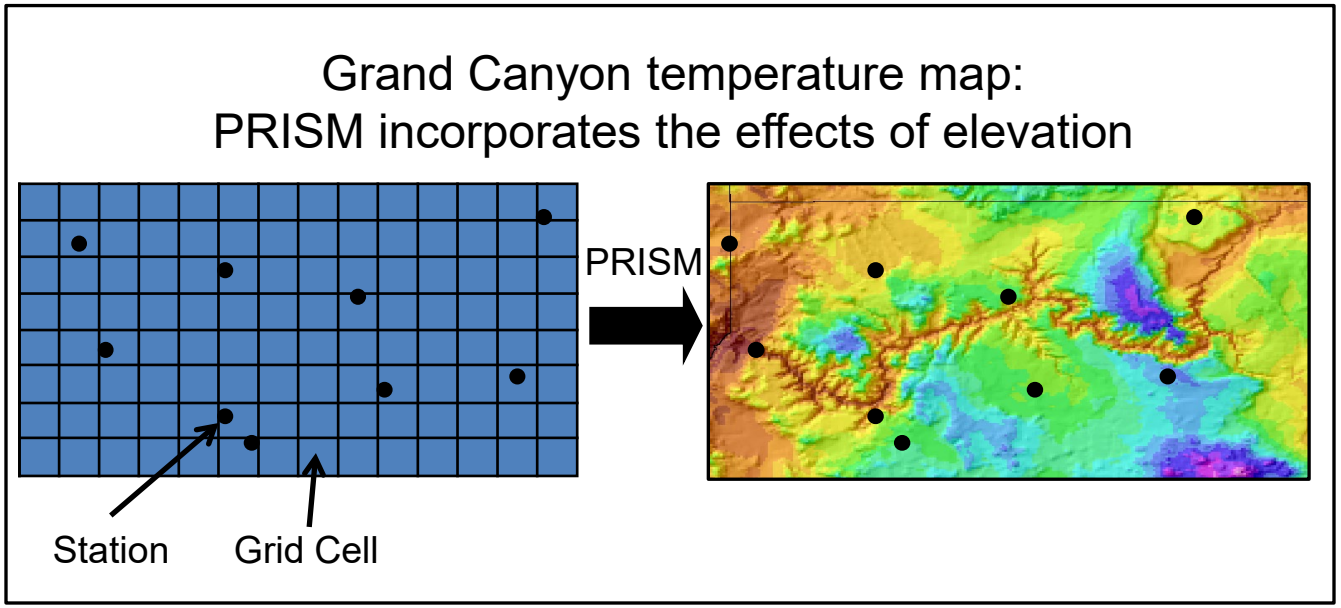
Climate maps show long-term averages of weather over a period of 10-30 years

PRISM is used to produce both kinds of maps.



How Does PRISM Work?

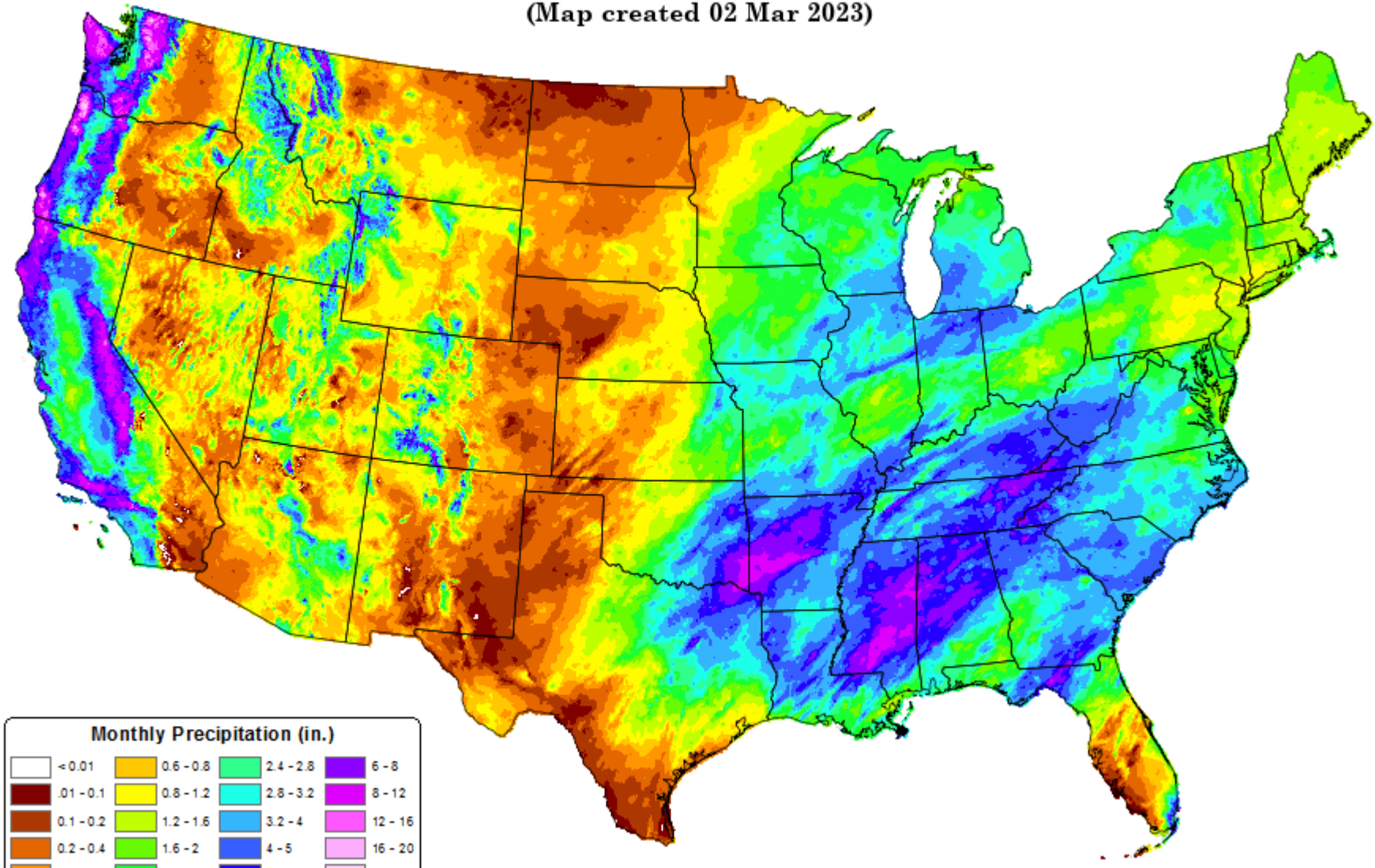
- We ingest daily data from 20,000+ precipitation and 6,000+ temperature stations across a range of monitoring networks
- Data are subject to rigorous QC processes
- For grid cells where no observations exist, the PRISM model mimics the thinking an expert meteorologist would follow



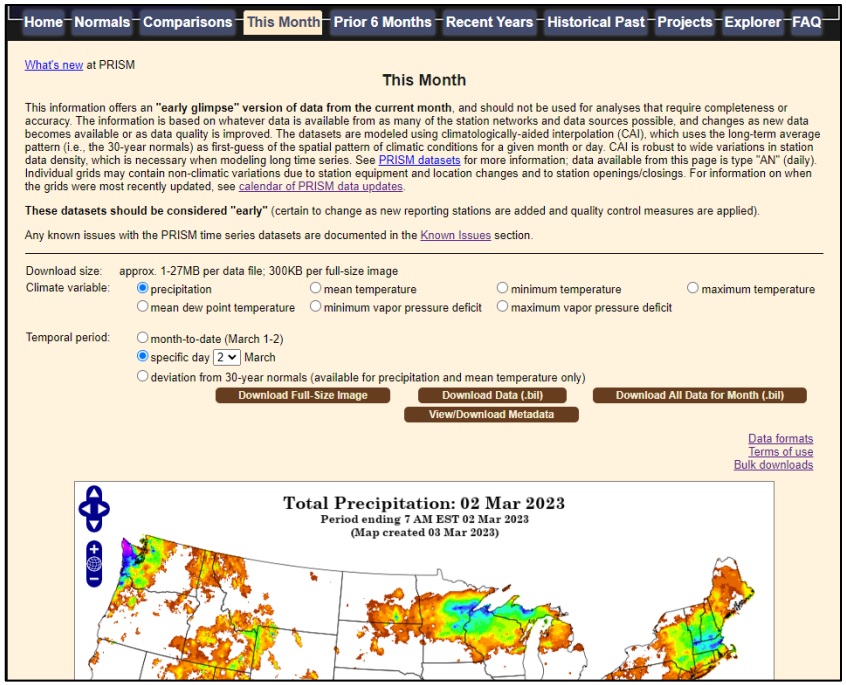
Total Precipitation: Feb 2023

Period ending 28 Feb 2023

(Map created 02 Mar 2023)



PRISM Data and Public Portal

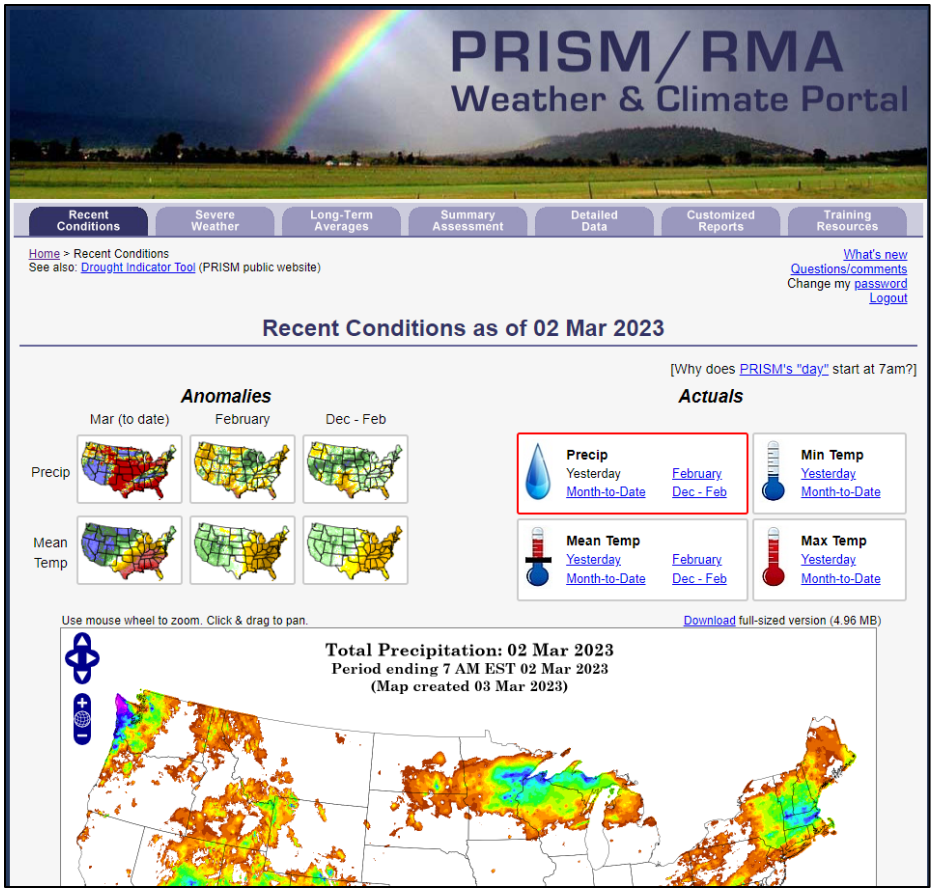


- PRISM data are produced at 800m and 4km resolutions
- PRISM 30-year climate normals are considered the USDA climate data of record; used extensively throughout USDA (as well as other federal agencies)
- Data can be downloaded via the web portal, FTP, or web services
- prism.oregonstate.edu

- PRISM grids are downloaded > 1M per month by a range of agencies, universities, corporations, etc.
- Our Data Explorer enables super-fast retrieval of time series data from a specific location

Current USDA-funded Projects

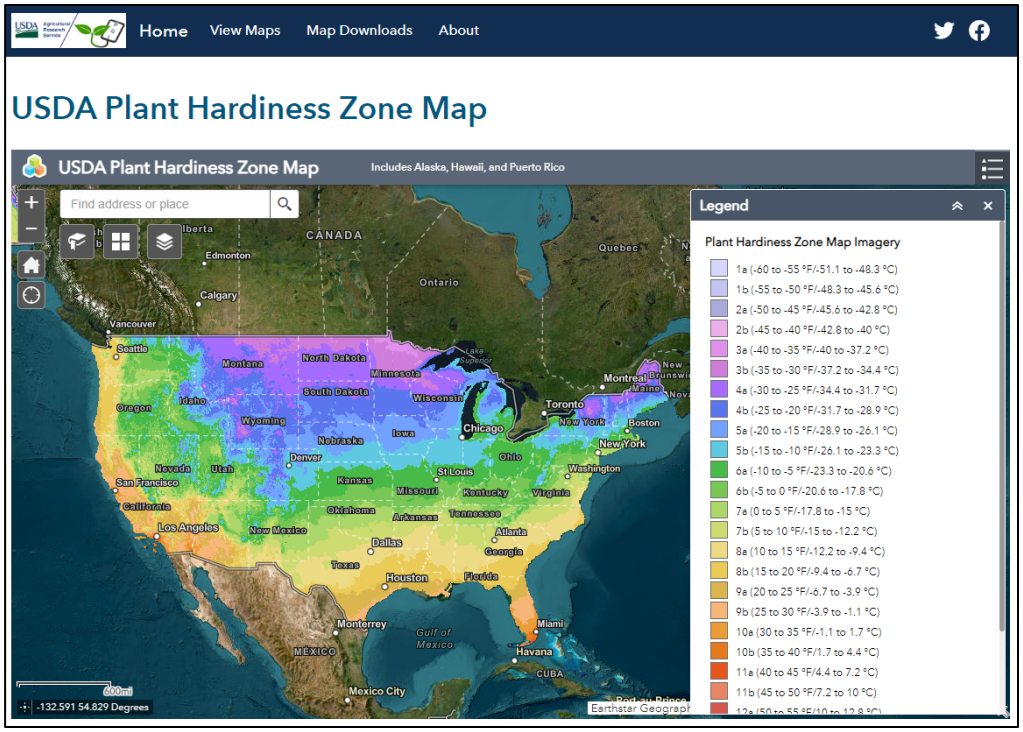
USDA Risk Management Agency (RMA)



- Long-running project in support of the Federal Crop Insurance Program (FCIC)
- Support > 6,000 crop insurance adjusters from 13 FCIC-approved companies
- Adjusters retrieve weather conditions for at a selected location and time and can compare against normal
- Reports built by our system are considered required documentation by USDA RMA

Current USDA-funded Projects

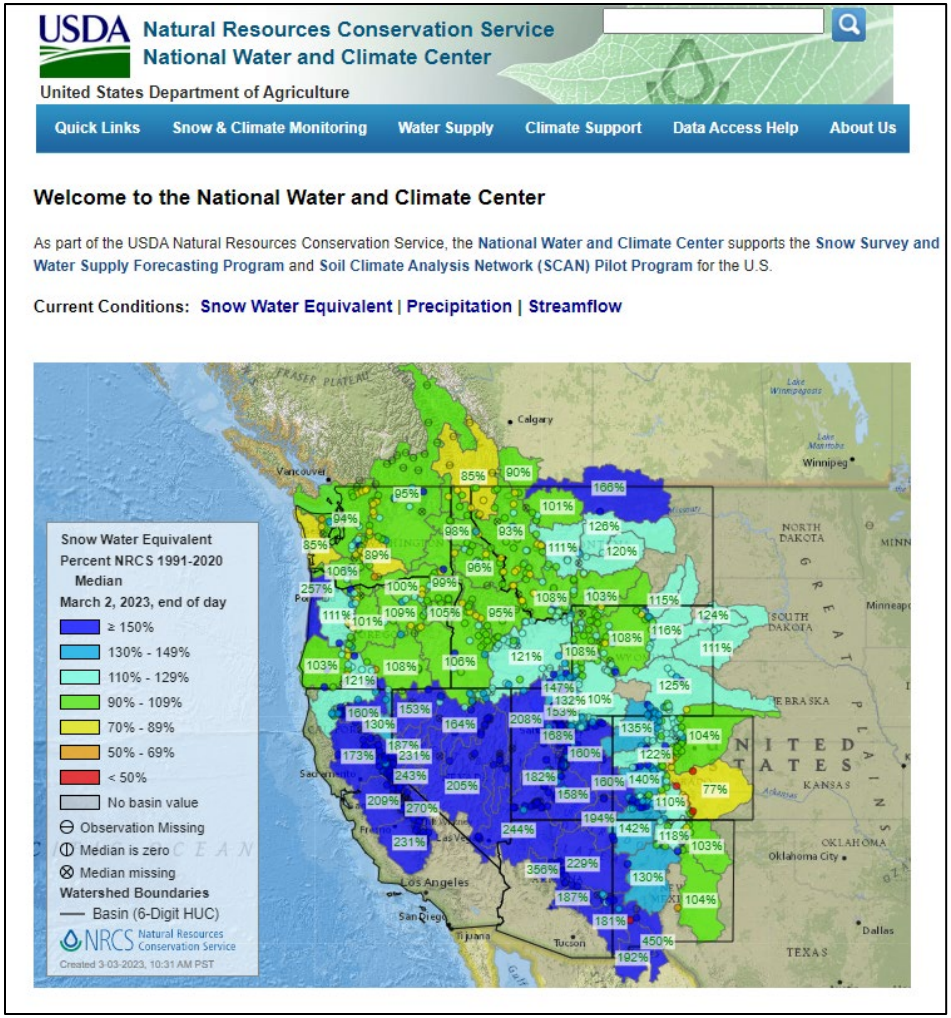
USDA Agricultural Research Service (ARS)



- We developed the first digital version of the USDA Plant Hardiness Zone Map (2012)
- This map is considered the most heavily-used climate map in the world
- Under contract with USDA ARS to produce an updated version of the PHZM (based on 1991-2020 climate normal period)
- Preliminary work complete; 40-member technical review team currently evaluating

Current USDA-funded Projects

USDA Natural Resources Conservation Service (NRCS)



- We have worked with USDA NRCS for many years to help QC their SNOTEL data
- Currently under contract with USDA NRCS to develop a robust, OpenAPI-enabled QC system for SNOTEL data
- PRISM data and modeling techniques help predict snowfall, SWE, and other measurements
- SNOTEL data are very important for western US agriculture water supply forecasting

Oregon Framework – Climate FIT

"Climate is a set of baseline meteorological conditions, including temperature and precipitation, that characteristically prevail in a particular region over a long period of time."

- Climate Framework Theme
- Climate data standard authored by George Taylor in 2003
- Includes data primarily describing atmospheric elements such precipitation, temperature, humidity, radiation, and derived variables
- Climate does not "end" at state boundaries but rather is continuous across a domain

Climate FIT – Inventory

- **Framework Data Inventory**
  - Reviewed current inventory and suggested modifications
  - Renamed most elements, removed a couple of non-existent elements

CL03	Rename	Climate	precipitation - mean monthly & annual	Thirty-year normal average precipitation, monthly and annual - used in a variety of natural resource applications. Data are in the form of grids in single-band BIL format covering the lower 48 states, one file per time step per element. Spatial resolutions are 30 arc-sec and 2.5 arc-min. Data are in a ZIP file that contains metadata and pedigree information.		Precipitation - monthly and annual normals
CL04	Rename	Climate	precipitation - historic daily	1981-present daily total precipitation- used in a variety of natural resource applications. Data are in the form of grids in single-band BIL format covering the lower 48 states, one file per time step per element. Spatial resolution is 2.5 arc-min. Data are in a ZIP file that contains metadata and pedigree information.		precipitation - historic daily time series
CL05	Rename	Climate	temperature - monthly mean min & max	Thirty-year normal average minimum and maximum daily temperature, monthly and annual- used in a variety of natural resource applications. Data are in the form of grids in single-band BIL format covering the lower 48 states, one file per time step per element. Spatial resolutions are 30 arc-sec and 2.5 arc-min. Data are in a ZIP file that contains metadata and pedigree information.		Temperature - monthly and annual normals
CL08	Rename	Climate	snow water equivalent	50-year return period snow load - used to develop structural engineering design specifications		50-year return period snow load

Climate FIT – Inventory

- **Recently-added elements**
  - Solar radiation (monthly & annual normals)
  - Cloud solar transmittance (monthly & annual normals)
- **Elements being researched**
  - Soil temperature
- **Elements that would be great to have**
  - Wind

Climate FIT – Involvement

- **University Groups**
  - NACSE / PRISM
  - Oregon Climate Change Research Institute (OCCRI)
- **Crossover with other FITs?**
  - Hazards?
  - Hydrography?
  - Land Use / Land Cover?
- **Other State of Oregon groups?**

Climate FIT – Involvement

Oregon Geospatial Enterprise Office

Climate FIT

- ▶GEO HOME
- ABOUT GEO
- GIS DATA AND SERVICES
- GIS COMMUNICATION
- GIS COORDINATION
- GIS STANDARDS
- CALENDAR
- CONTACT US

Contacts

Climate FIT Lead

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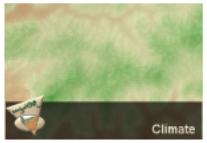
Standards and Documents

Standards

- Oregon Climate Data Standard

Resources

PRISM Climate Group
Oregon Climate Change Research Group



Climate FIT Communications

- Climate FIT Listserv

Framework Themes

- Address Points
- Admin Boundaries
- Bioscience
- Cadastral
- Climate
- Coastal and Marine
- Elevation
- Geodetic Control
- Geoscience
- Hazards
- Hydrography
- Imagery
- Land Use/Land Cover
- Preparedness
- Reference
- Transportation
- Utilities

Framework Tools

- Keyword Thesaurus
- Oregon GIS Standards