

# Climate Framework Implementation Team (FIT) Update

## Oregon Framework Spring Forum 2023

Dylan Keon  
Oregon State University  
Climate FIT Lead



Oregon State University  
College of Engineering



# 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



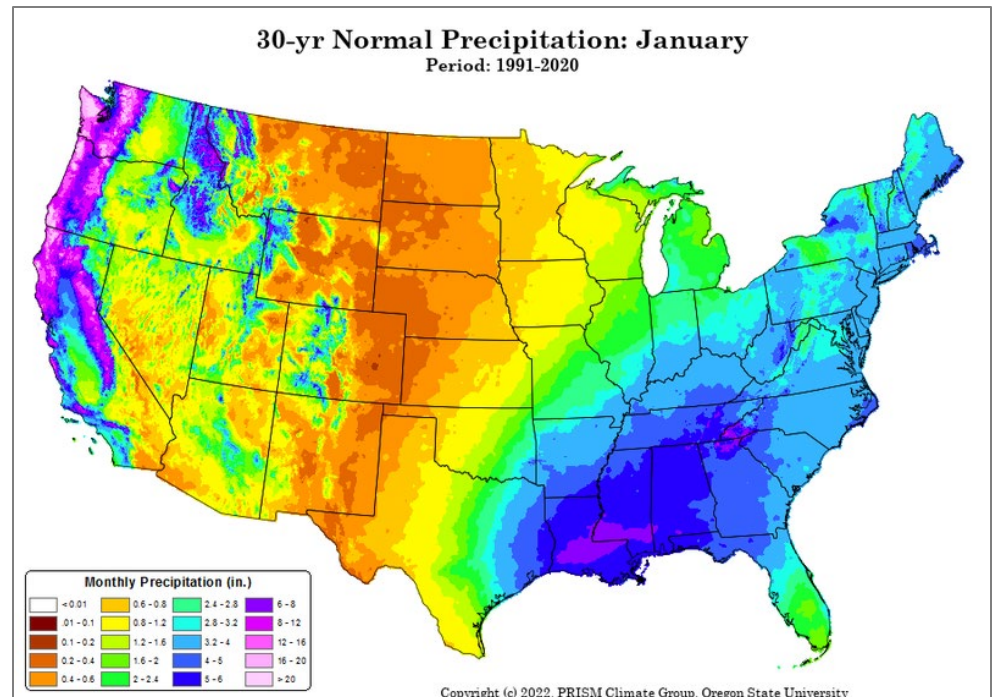
# What is PRISM?

- 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.

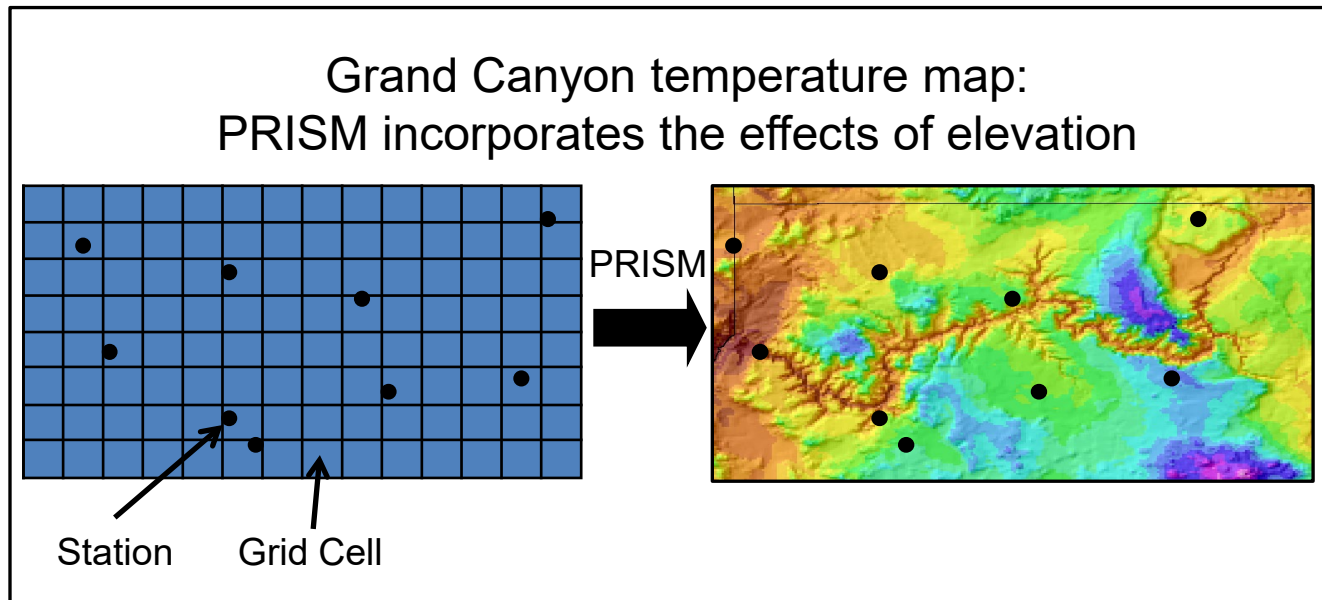
**Climate maps** show long-term averages of weather over a period of 10-30 years

**PRISM** is used to produce both kinds of maps.



# How Does PRISM Work?

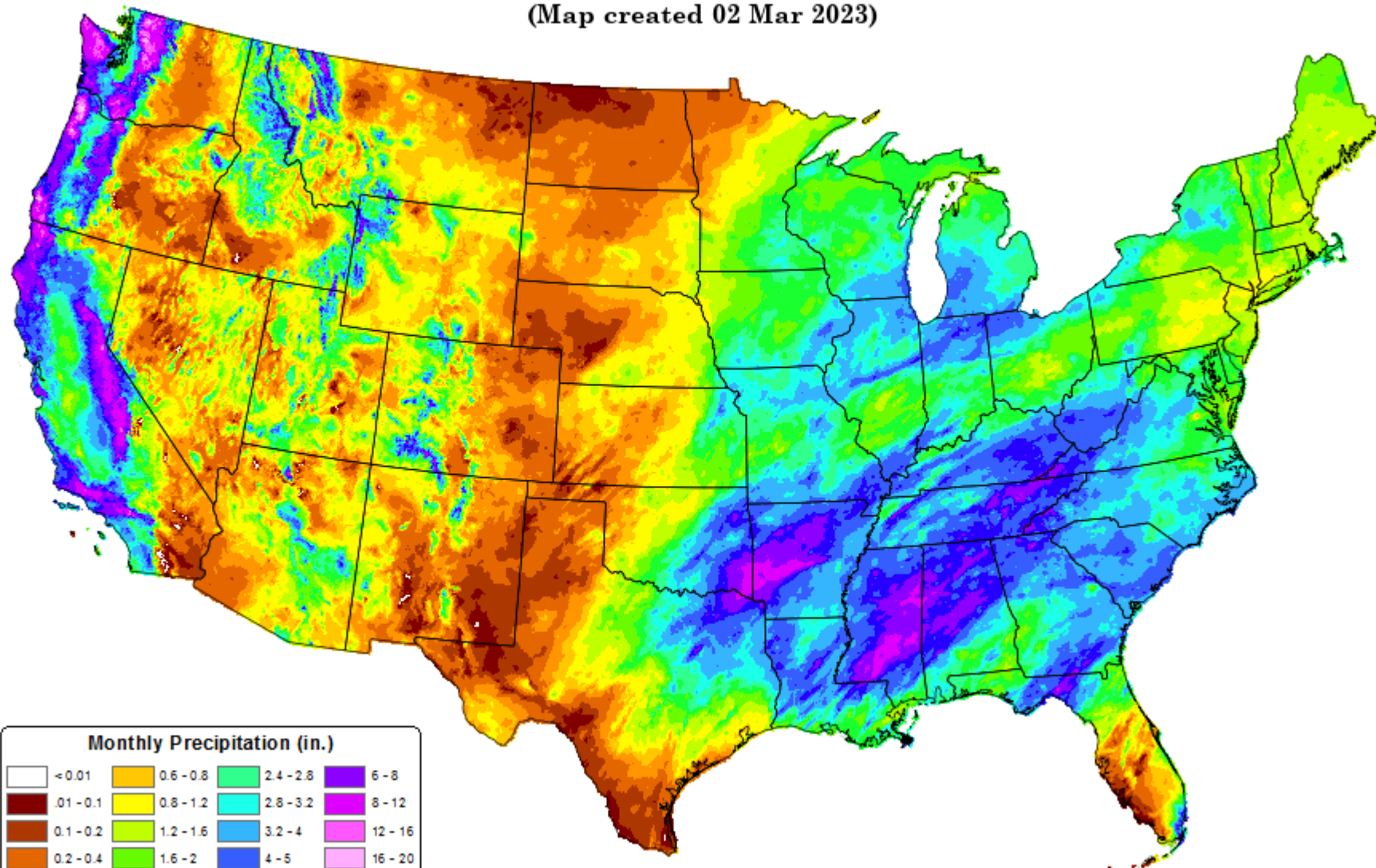
- We ingest daily data from 20,000+ precipitation and 6,000+ temperature stations across a range of monitoring networks
- Data are subject to rigorous QC processes
- For grid cells where no observations exist, the PRISM model mimics the thinking an expert meteorologist would follow



# Total Precipitation: Feb 2023

Period ending 28 Feb 2023

(Map created 02 Mar 2023)



Monthly Precipitation (in.)			
<0.01	0.6-0.8	2.4-2.8	6-8
.01-0.1	0.8-1.2	2.8-3.2	8-12
0.1-0.2	1.2-1.6	3.2-4	12-16
0.2-0.4	1.6-2	4-5	16-20
0.4-0.6	2-2.4	5-6	>20

# PRISM Data and Public Portal

Home Normals Comparisons **This Month** Prior 6 Months Recent Years Historical Past Projects Explorer FAQ

[What's new](#) at PRISM

**This Month**

This information offers an "early glimpse" version of data from the current month, and should not be used for analyses that require completeness or accuracy. The information is based on whatever data is available from as many of the station networks and data sources possible, and changes as new data becomes available or as data quality is improved. The datasets are modeled using climatologically-aided interpolation (CAI), which uses the long-term average pattern (i.e., the 30-year normals) as first-guess of the spatial pattern of climatic conditions for a given month or day. CAI is robust to wide variations in station data density, which is necessary when modeling long time series. See [PRISM datasets](#) for more information; data available from this page is type "AN" (daily). Individual grids may contain non-climatic variations due to station equipment and location changes and to station openings/closings. For information on when the grids were most recently updated, see [calendar of PRISM data updates](#).

These datasets should be considered "early" (certain to change as new reporting stations are added and quality control measures are applied). Any known issues with the PRISM time series datasets are documented in the [Known Issues](#) section.

Download size: approx. 1-27MB per data file; 300KB per full-size image

Climate variable:  precipitation  mean temperature  minimum temperature  maximum temperature  
 mean dew point temperature  minimum vapor pressure deficit  maximum vapor pressure deficit

Temporal period:  month-to-date (March 1-2)  specific day  deviation from 30-year normals (available for precipitation and mean temperature only)

[Data formats](#)  
[Terms of use](#)  
[Bulk downloads](#)

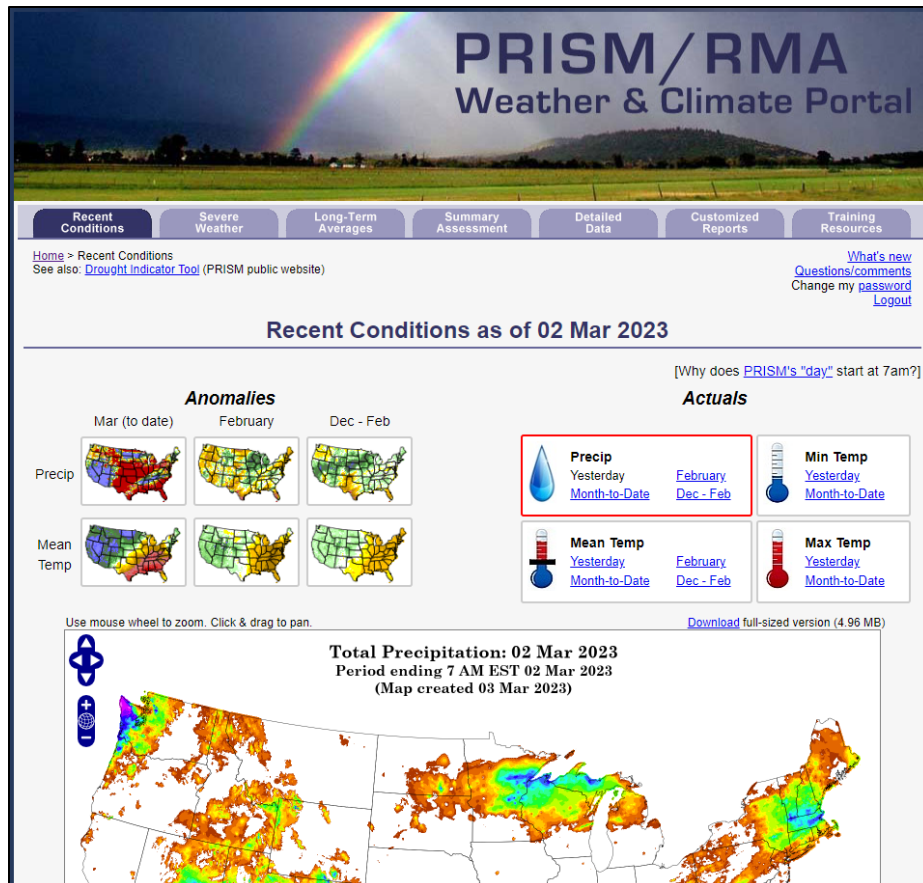
**Total Precipitation: 02 Mar 2023**  
Period ending 7 AM EST 02 Mar 2023  
(Map created 03 Mar 2023)

- 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](http://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

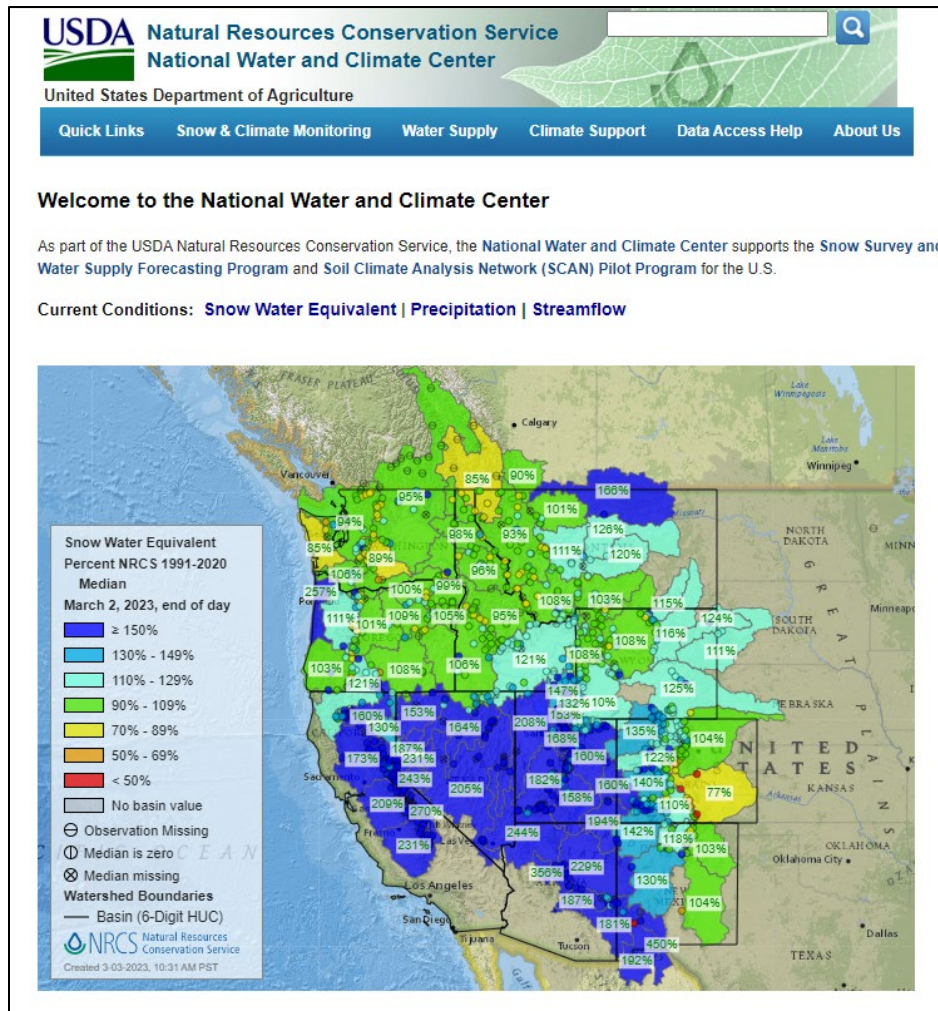
## USDA Agricultural Research Service (ARS)



- 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

Dylan Keon, Oregon State University  
541-737-6608  
[dylan.keon@oregonstate.edu](mailto:dylan.keon@oregonstate.edu) 

### 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](#)