



The USGS Data Grapher

“Let’s Explore the Data!”

Stewart Rounds
USGS
Oregon Water Science Center
Portland, OR

What is the Data Grapher?

- A tool for data exploration: graphing and tabling time-series datasets, primarily from NWIS
- An improvement over some aspects of NWIS-Web
- A system that may merge with USGS NRTWQ at some point?

USGS Data Grapher

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Data Grapher links: Home Time Series XY Graphs Polar Graphs Tables Help

USGS Data Grapher

This is a data graphing utility that allows the user to build graphs of data from stations. Select the station, the type of graph, the parameter(s) to plot, and the starting and ending dates for the graph. Then, click the button labeled "Make Graph."

Step 1: [Optional] Choose a basin from the drop-down list.

Tualatin River Basin, Oregon Update Site List

Step 2: Choose a site from the drop-down list.

14206694 - Tualatin River at River Mile 24.5 Update Parameter List

Parameter	Availability of Approved Data		Date of Last Reading
	Begin Date	End Date	
Water Temperature	May-23-1997 16:00	Dec-01-2011 12:00	Dec-01-2011 12:00
Dissolved Oxygen	May-27-1997 15:00	Dec-01-2011 12:00	Dec-01-2011 12:00
Oxygen % Saturation	May-27-1997 15:00	Dec-01-2011 12:00	Dec-01-2011 12:00
pH	May-23-1997 16:00	Dec-01-2011 12:00	Dec-01-2011 12:00
Specific Conductance	May-23-1997 16:00	Dec-01-2011 12:00	Dec-01-2011 12:00

Measurements at this site are available here at [60 minute intervals](#).
More data from this site may be available from [NWIS-Web](#).

Step 3: Choose a graph type.

Time Series
 XY Plot

Step 4: Choose the parameters to plot. For an XY plot, the 2nd parameter will be on the X axis.

1st Parameter: Water Temperature All Data
 Apply a 7-day running average.

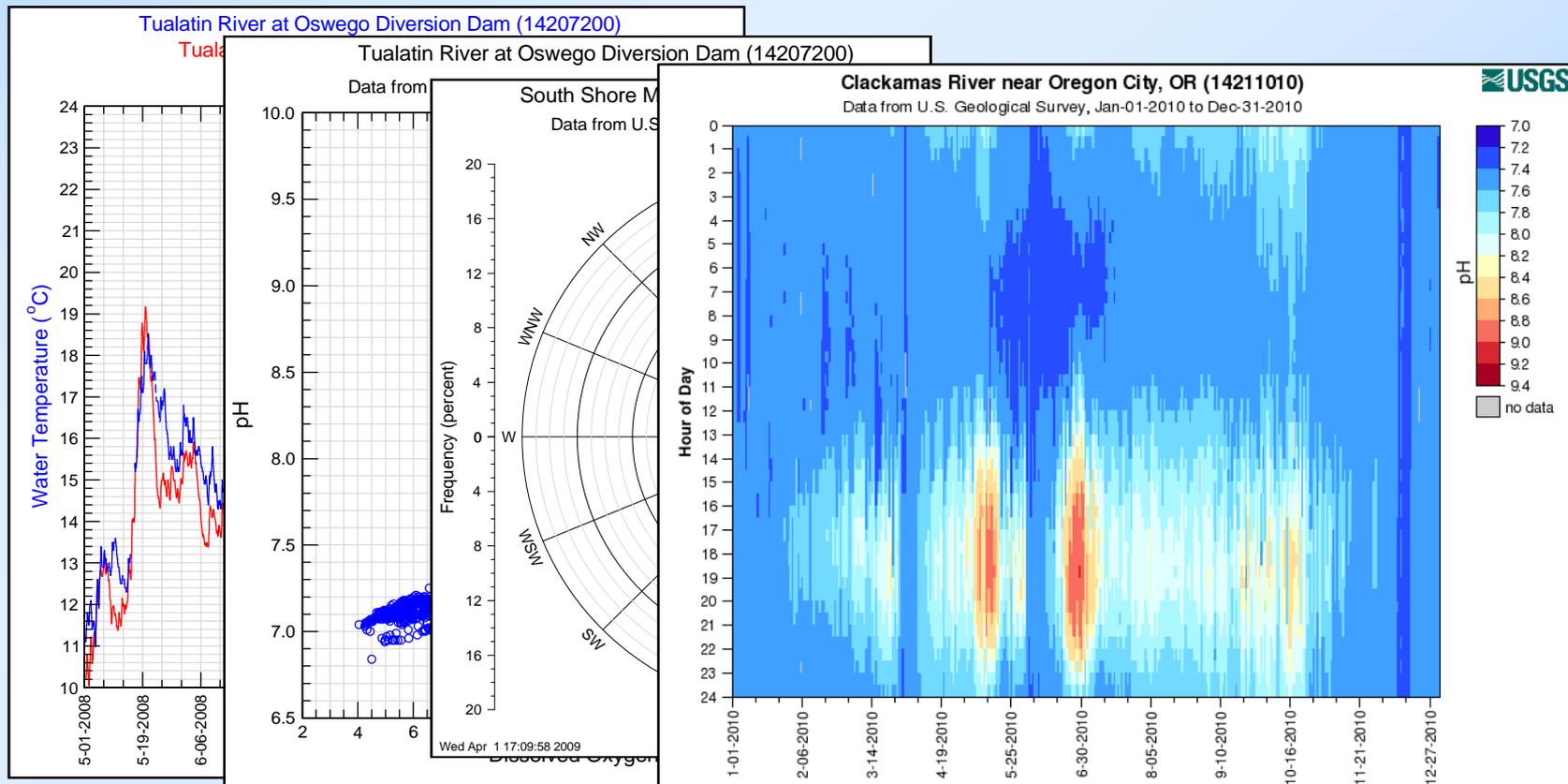
2nd Parameter: -NONE- All Data
 Apply a 7-day running average.

Step 5: Choose starting and ending dates for the data in the graph.

Begin Date: Nov -01 -2011
End Date: Dec -01 -2011 Include all data

What Does the Data Grapher Do?

- Graphs and tables your data in useful ways!
- Uses instantaneous values exported from NWIS
- Computes daily statistics & running averages
- Makes time series graphs, XY plots, wind roses, color maps



What Does the Data Grapher Do?

- Graphs and tables your data in useful ways!
- Uses instantaneous values exported from NWIS
- Computes daily statistics & running averages
- Makes time series graphs, XY plots, wind roses, color maps
- Computes DO saturation, TDG saturation, FI, SSC
- Compares time series data at 1, 2, or 3 sites
- Installations at this time:
 - Oregon (20 basins, 290 sites, 1049 time series records)
 - Tennessee (6 basins, 42 sites, 217 time series records)
 - Idaho (2 basins, 3 sites, 23 time series records)
 - Colorado (internal: 4 basins, 287 sites, 423 time series records)
 - California (3 projects, 55 sites, 228 time series records)
 - New Jersey (in progress)

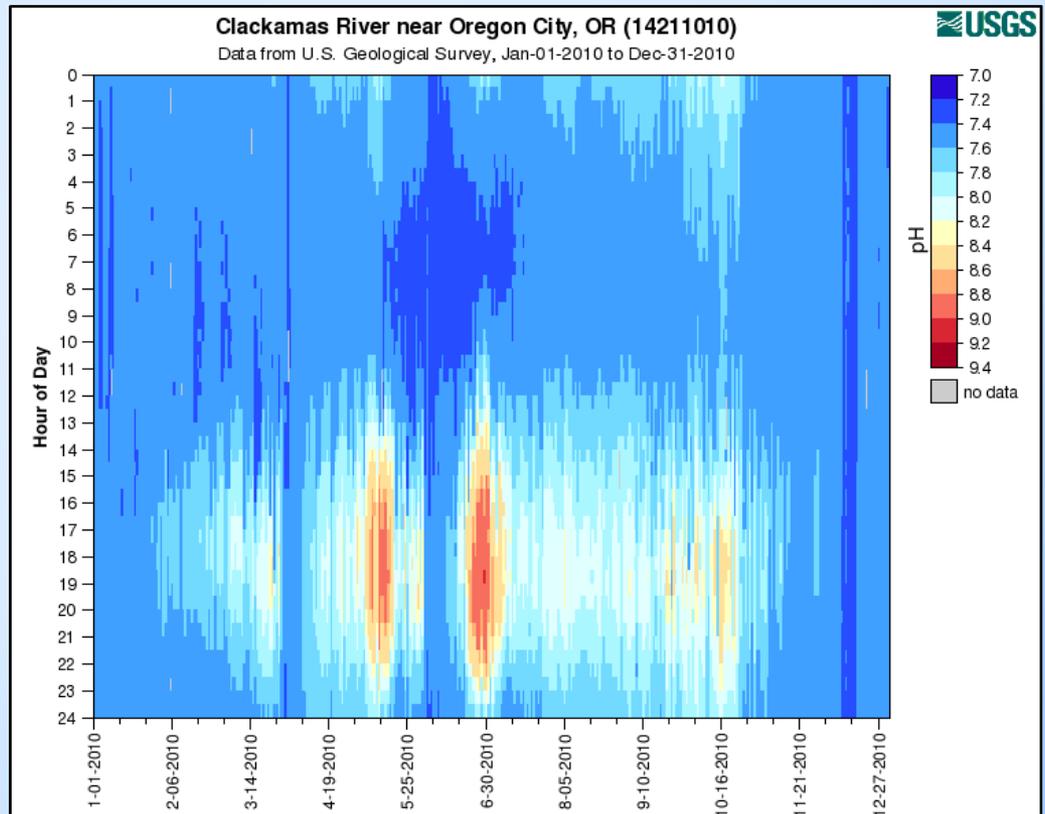
What's New?

- Oxygen solubility equations updated
 - Discarded Weiss (1970) equations
 - Now using Benson and Krause (1980, 1984) equations
 - Salinity correction now included
- Five video tutorials added

The screenshot shows the USGS Oregon Water Science Center website. At the top left is the USGS logo with the tagline "science for a changing world". To the right are links for "USGS Home", "Contact USGS", and "Search USGS". Below this is a navigation bar for the "Oregon Water Science Center" with links for "Data Grapher links", "Home", "Time Series", "XY Graphs", "Polar Graphs", "Tables", and "Help". The main heading is "USGS Data Grapher". Below this, a video player is embedded, showing a "Menu Tutorial" window. The video player has a play button in the center and a progress bar at the bottom showing "00:00". The video content includes the USGS logo and the text "USGS Data Grapher Tutorial - Introduction". To the left of the video player, there are labels for "Step 1:", "Step 2:", and "Step 3:". Below the video player, the text "Step 3: Choose a graph type." is visible, followed by radio button options for "Time Series" and "XY Plot".

What's New?

- Oxygen solubility equations updated
 - Discarded Weiss (1970) equations
 - Now using Benson and Krause (1980, 1984) equations
 - Salinity correction now included
- Five video tutorials added
- New parameters added, including Fluorescence Index
- Color maps added
- Links to NWIS-Web
- Data table rounding to USGS publication standards



How Do I Use It?



USGS Data Grapher

This is a data graphing utility that allows the user to set the parameter(s) to plot, and the starting and ending dates.

Step 1: [Optional] Choose a basin from the drop-down

Tualatin River Basin, Oregon

Step 2: Choose a site from the drop-down list.

14206694 - Tualatin River at River Mile 24.5

Parameter	Availability of Begin Date
Water Temperature	May-23-1997 16:00
Dissolved Oxygen	May-27-1997 15:00
Oxygen % Saturation	May-27-1997 15:00
pH	May-23-1997 16:00
Specific Conductance	May-23-1997 16:00

Measurements at this site are available here. More data from this site may be available in the future.

Step 3: Choose a graph type.

- Time Series
 XY Plot

Step 4: Choose the parameters to plot. For an XY plot

1st Parameter: Water Temperature
 Apply a 7-day running average

2nd Parameter: -NONE-
 Apply a 7-day running average

Step 5: Choose starting and ending dates for the data

Begin Date: - -
 End Date: - -

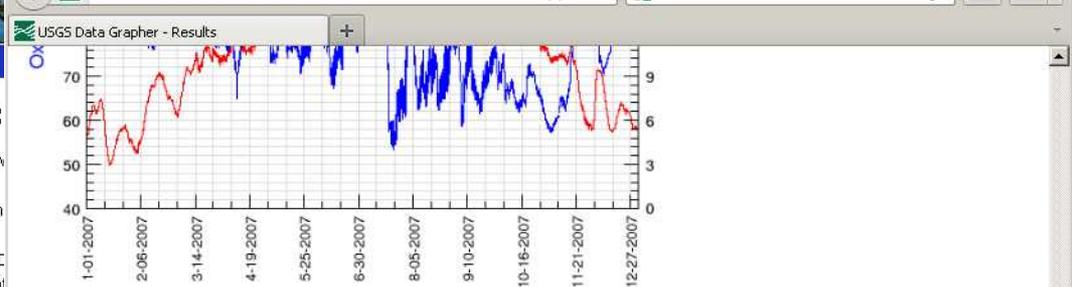
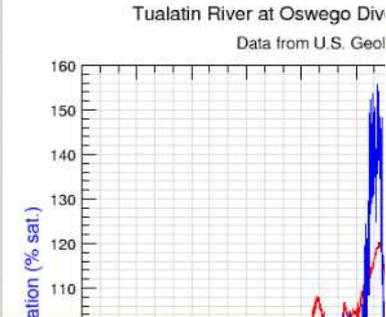


Results of Data Grapher:

Site: Tualatin River at Oswego Div
USGS ID: 14207200
Basin: Tualatin River Basin, Oregon
Graph Type: Time Series
1st Parameter: Oxygen % Saturation -- All Data
2nd Parameter: Water Temperature -- All Data
Begin Date: Jan-01-2007 00:00
End Date: Dec-31-2007 24:00

Note: Oxygen percent saturation is calculated using barometric pressure. If barometric pressure is not available, then a pressure of approximately 101 feet above sea level is used.

Graph created Thursday, 03-May-2012, 10:22 EDT



Thu May 3 10:23:00 2012

This is a PNG image. [\[help\]](#)

- Download the [data](#) used to create this graph.
- View an inventory table of the [oxygen % saturation](#) or [water temperature](#) data.
- Download this plot in a specific format:

Format:

- Replot these data with different axis limits:

New axis limits for oxygen % saturation:

Minimum:
 Maximum:

New axis limits for water temperature:

Minimum:
 Maximum:

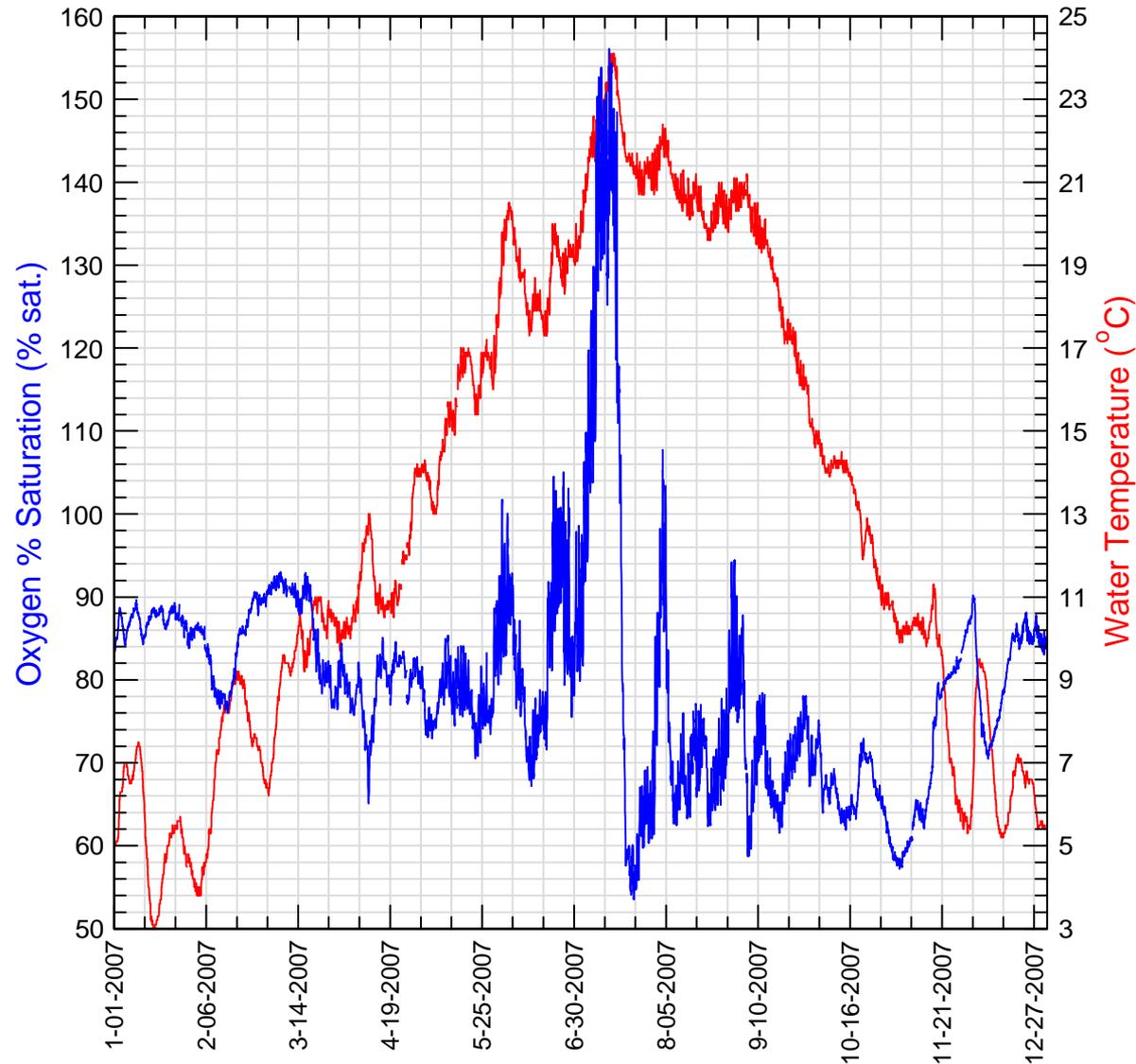
Begin Date: - -
 End Date: - -

- [Return](#) to the Data Grapher.

Examples: Time Series Plot – One Site

Tualatin River at Oswego Diversion Dam (14207200)

Data from U.S. Geological Survey

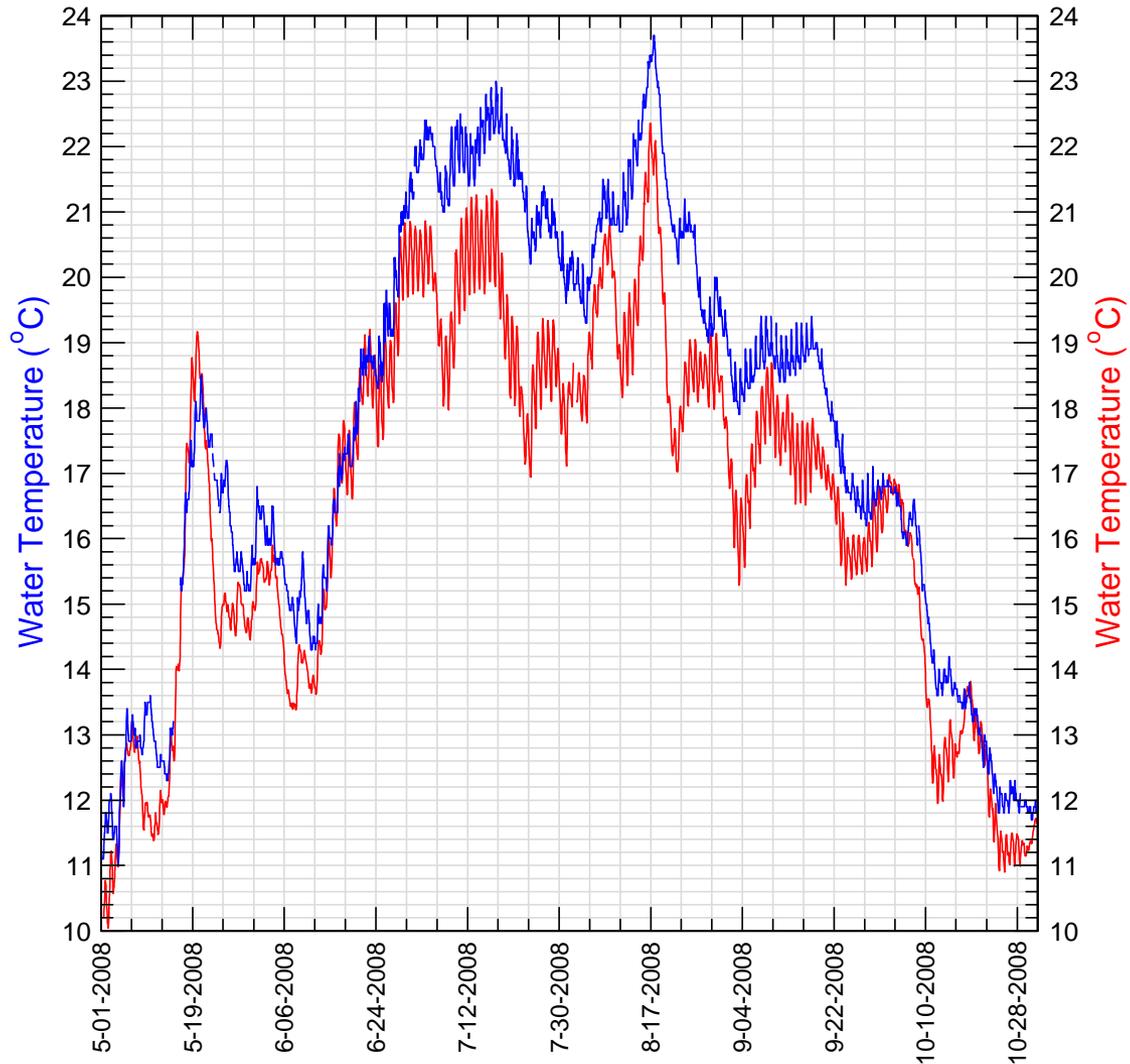


Time Series Plot – Two Sites

Tualatin River at Oswego Diversion Dam (14207200)

Tualatin River at River Mile 24.5 (14206694)

Data from U.S. Geological Survey



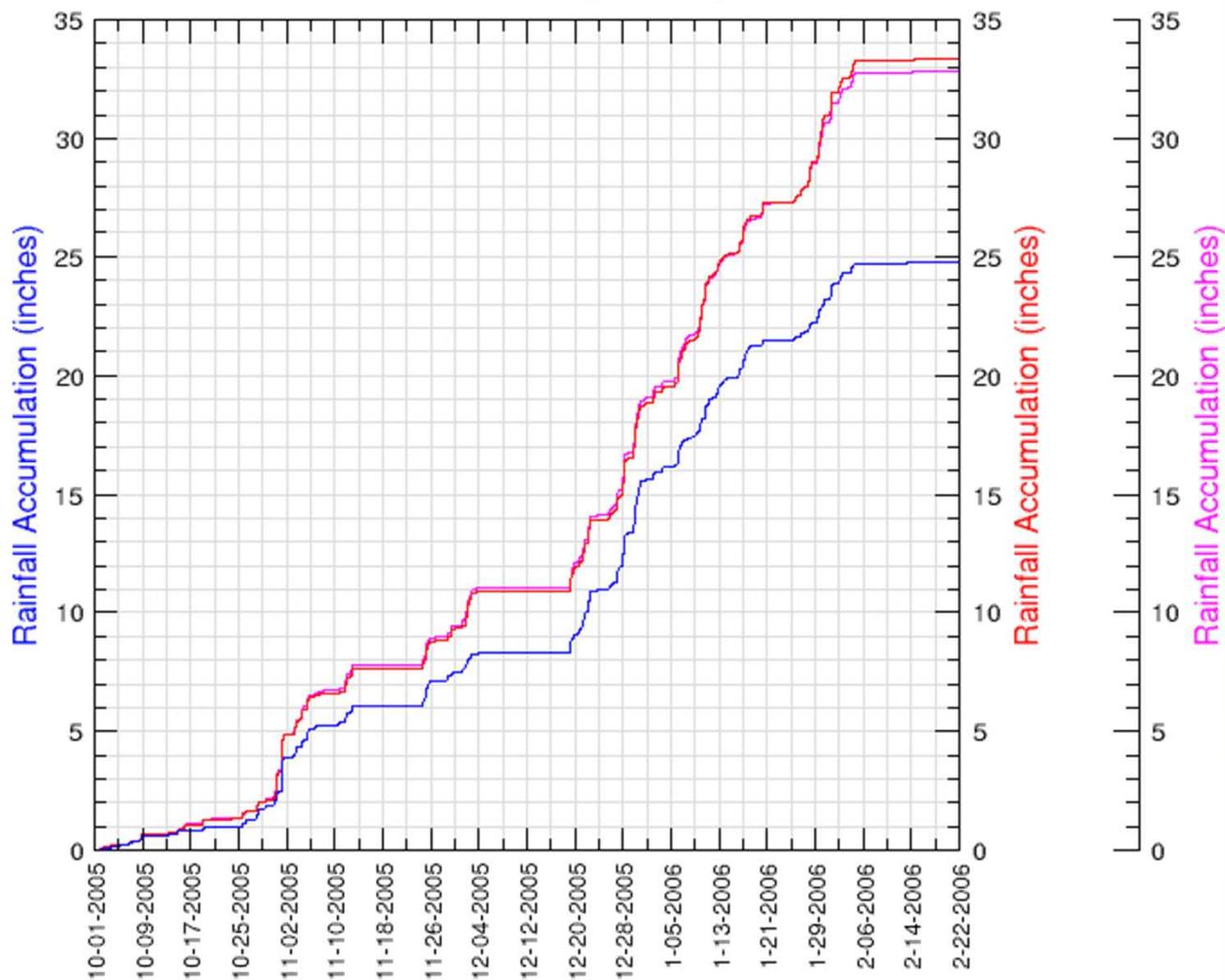
Time Series Plots – Multiple Sites

Durham Treatment Facility at Durham, OR (452359122454500)

Conestoga Aquatic Center Raingage at Tigard, OR (452657122481700)

Progress Fire Station Raingage at Tigard, OR (452732122464600)

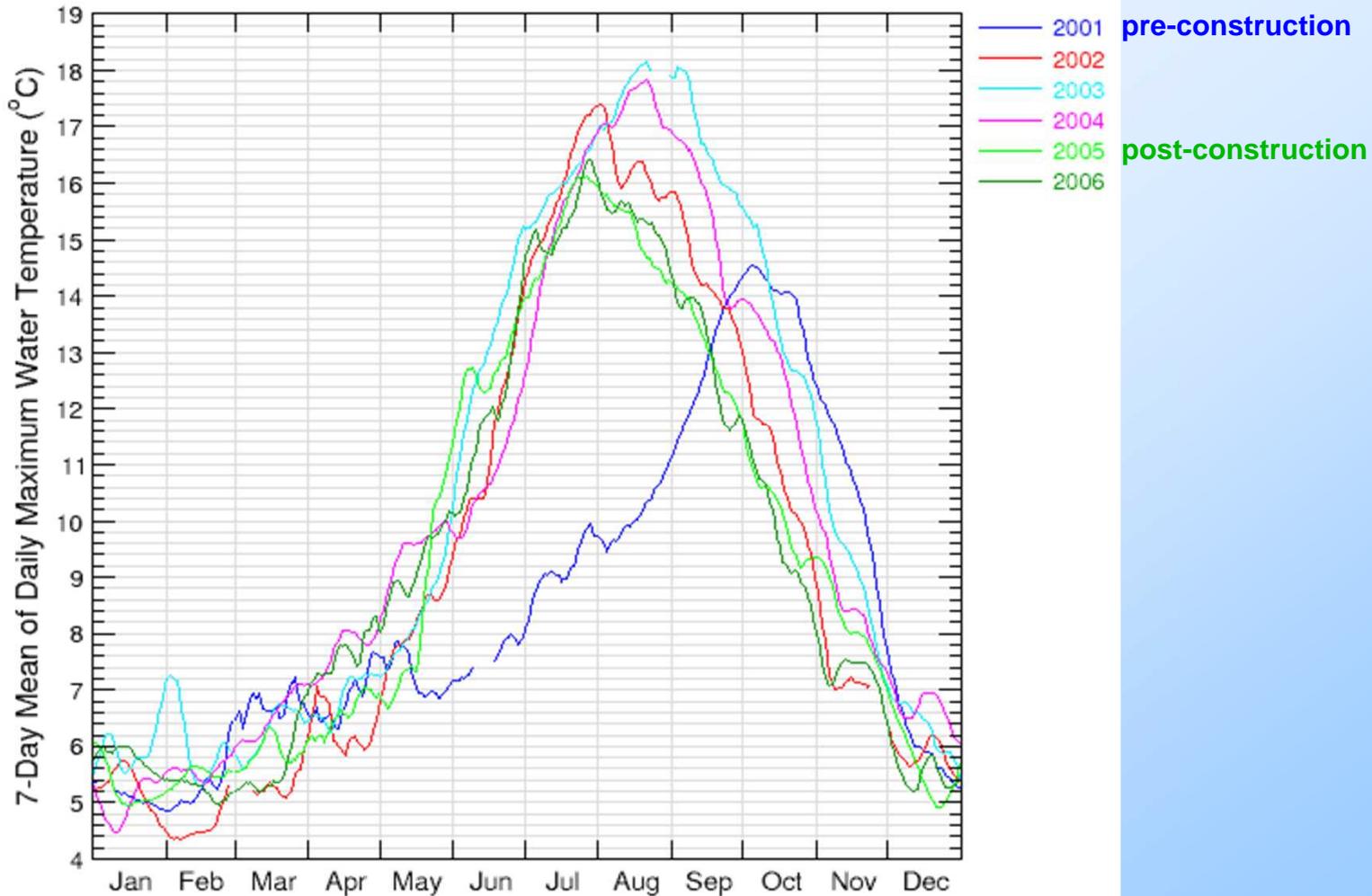
Data from U.S. Geological Survey



Inter-Year Comparisons

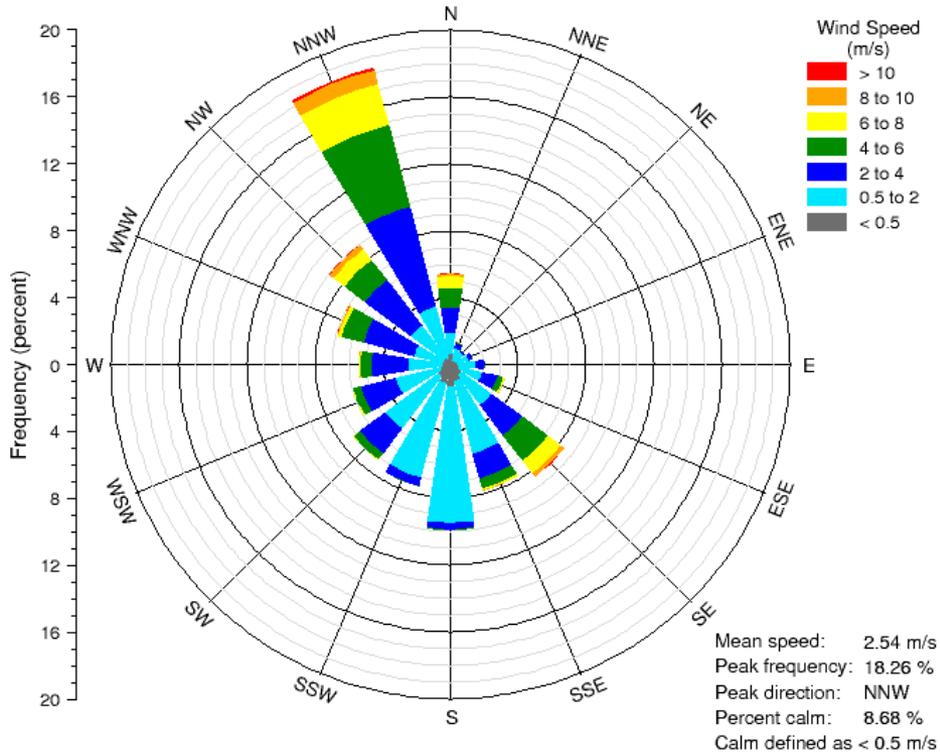
South Fork McKenzie River nr Rainbow, OR (14159500)

Data from U.S. Geological Survey

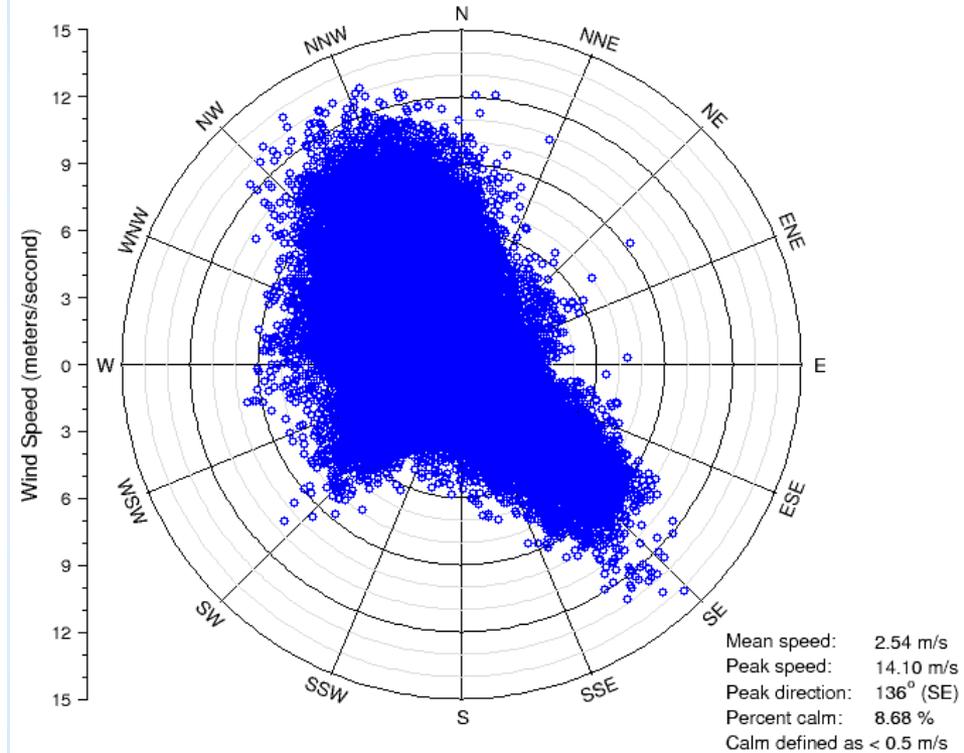


Wind Rose and Speed/Direction Plots

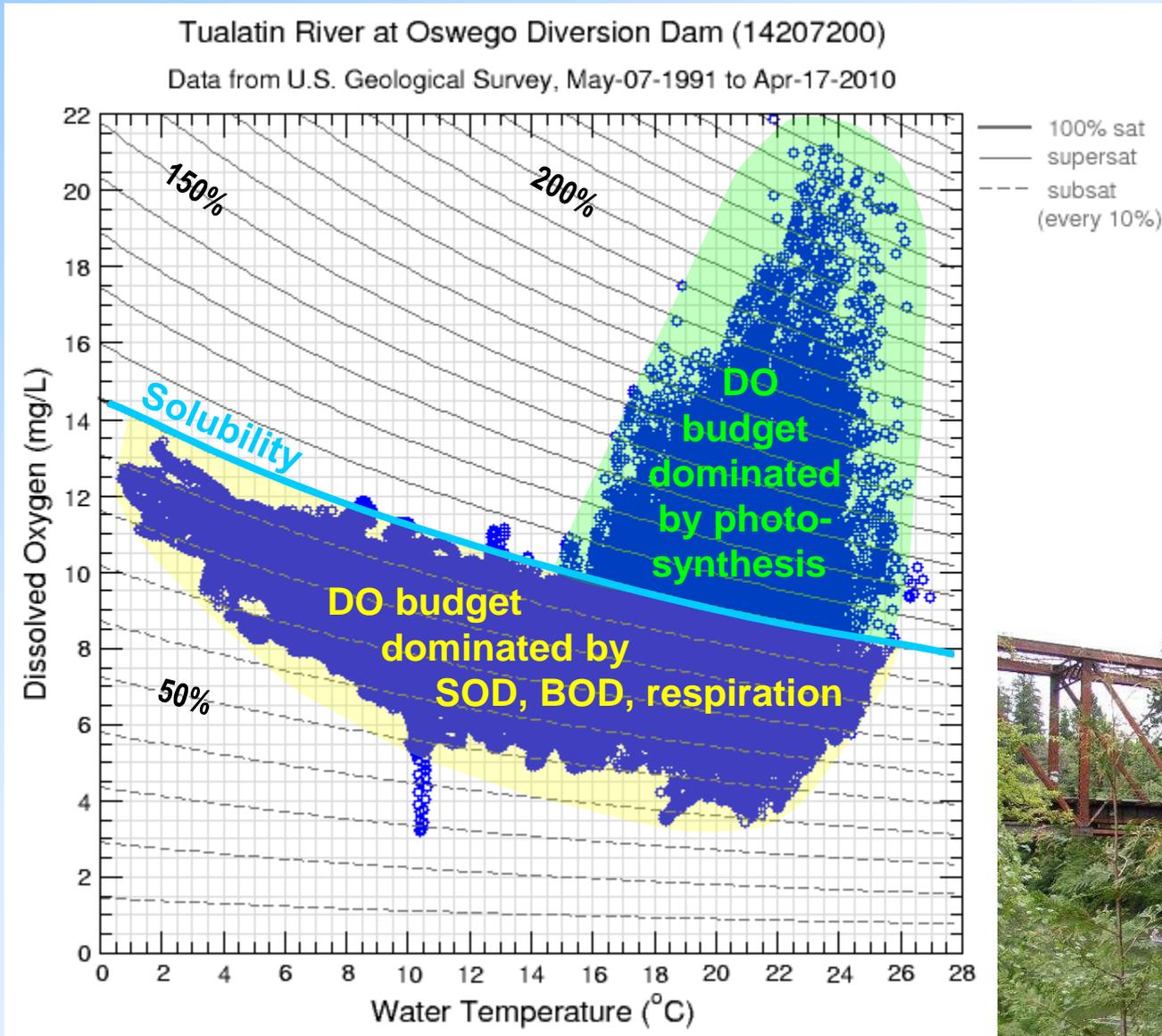
South Shore Met Station [SSHR MET] (421402121491400)
Data from U.S. Geological Survey, Aug-18-2005 to Jan-24-2011



South Shore Met Station [SSHR MET] (421402121491400)
Data from U.S. Geological Survey, Aug-18-2005 to Jan-24-2011



Custom Plots for Understanding Instream Processes

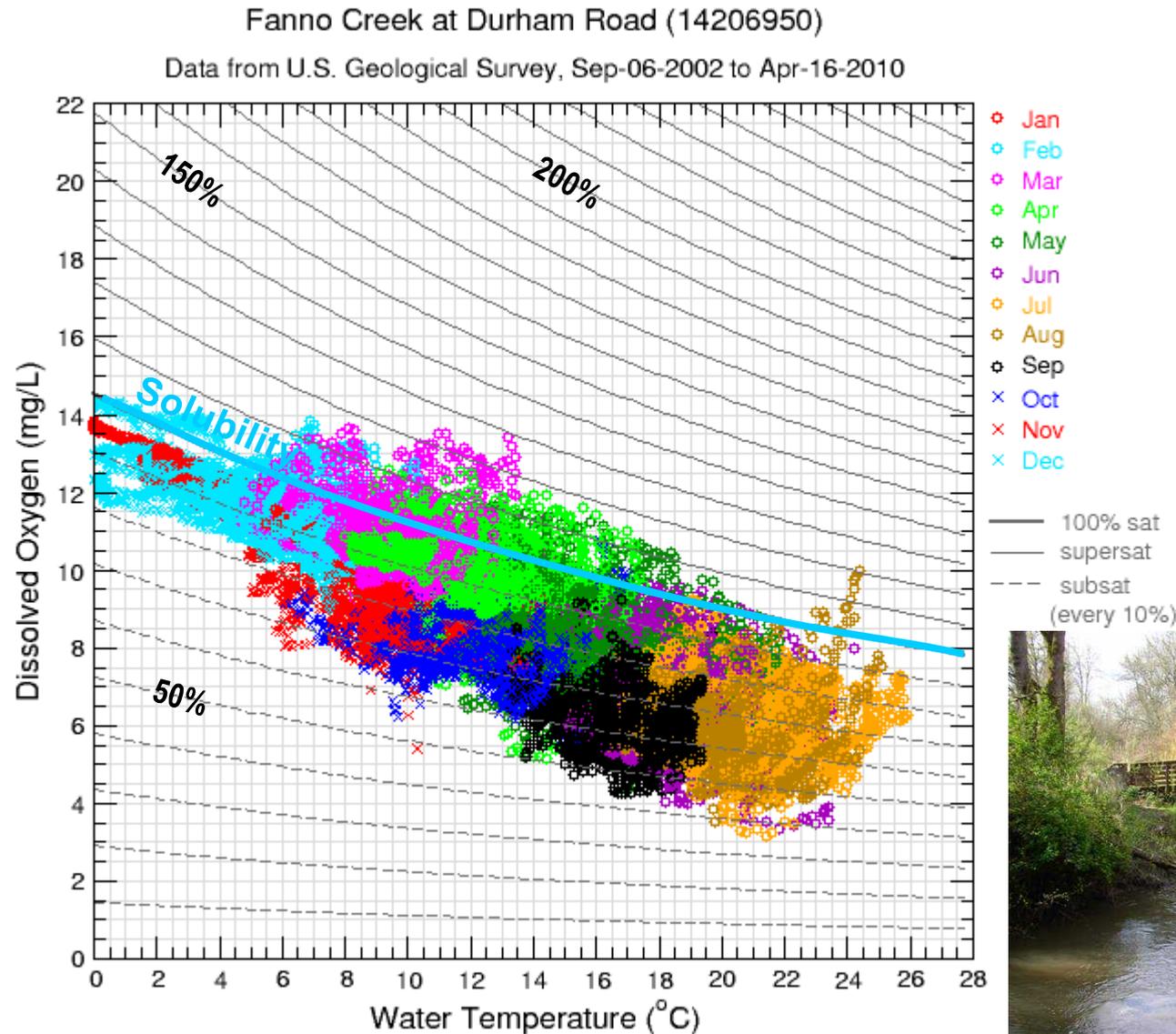


- Slow reaeration
- Significant SOD and BOD
- Algal growth in summer



photo by Stewart Rounds, USGS

Another Site, Another Pattern



- **Slow reaeration**
- **Large oxygen demands**
- **Small creek, more shading; therefore, less photosynthesis in summer**



photo by Stewart Rounds, USGS

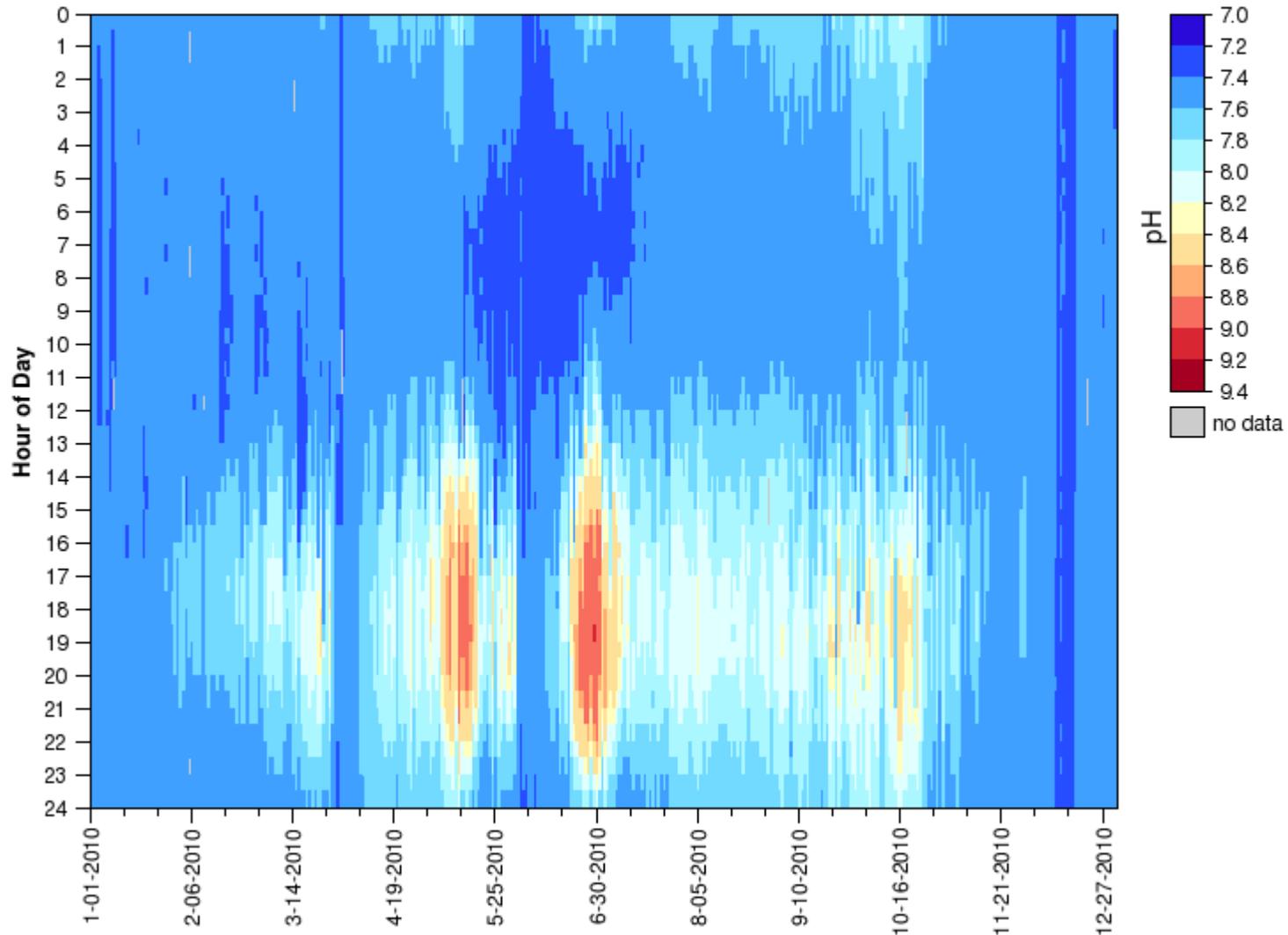
Color Maps!

Clackamas River near Oregon City, OR (14211010)



pH

Data from U.S. Geological Survey, Jan-01-2010 to Dec-31-2010



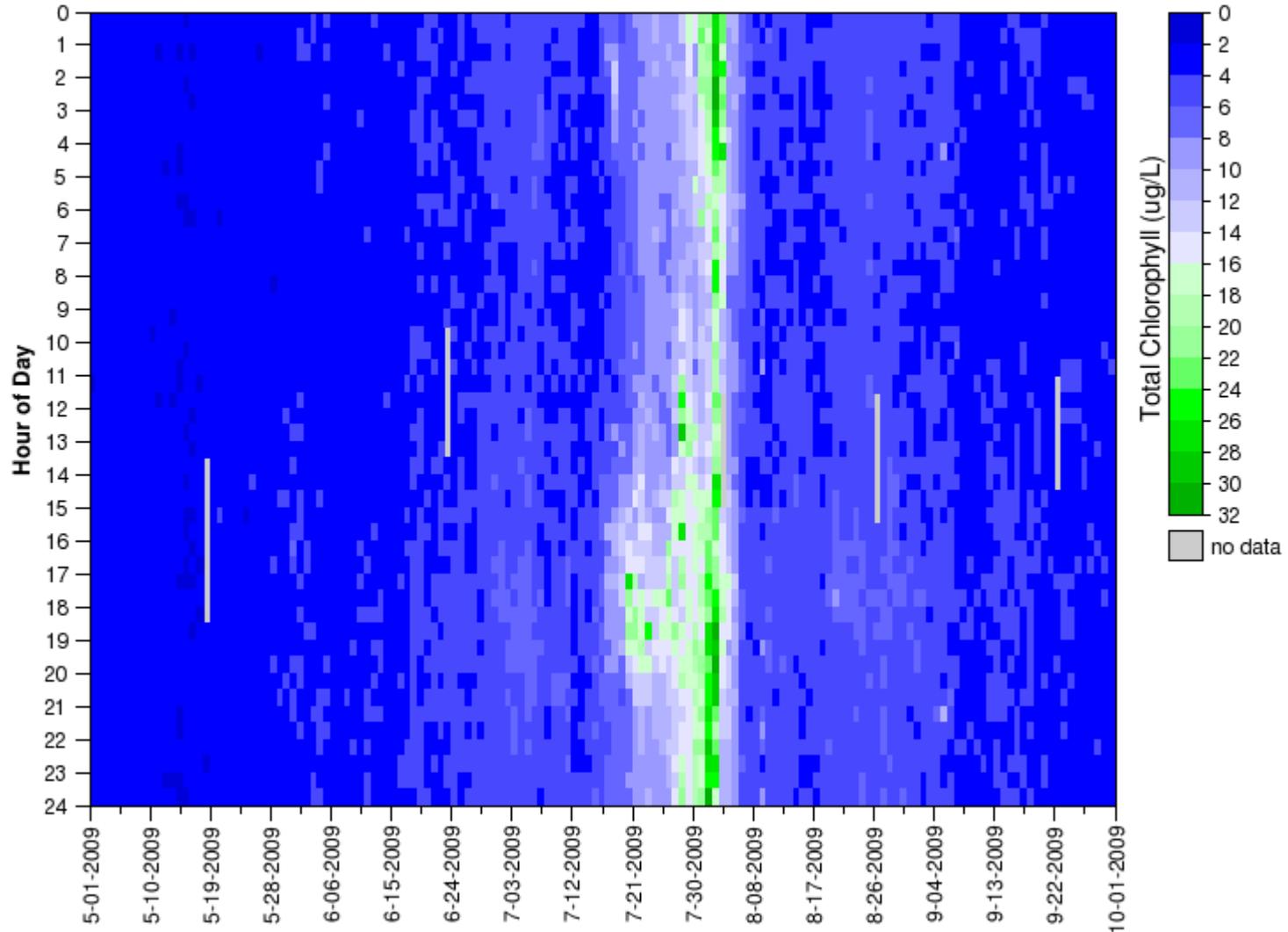
Date / Hour Color Map

Willamette River at Portland, OR (14211720)



Total Chlorophyll (ug/L)

Data from U.S. Geological Survey, May-01-2009 to Sep-30-2009

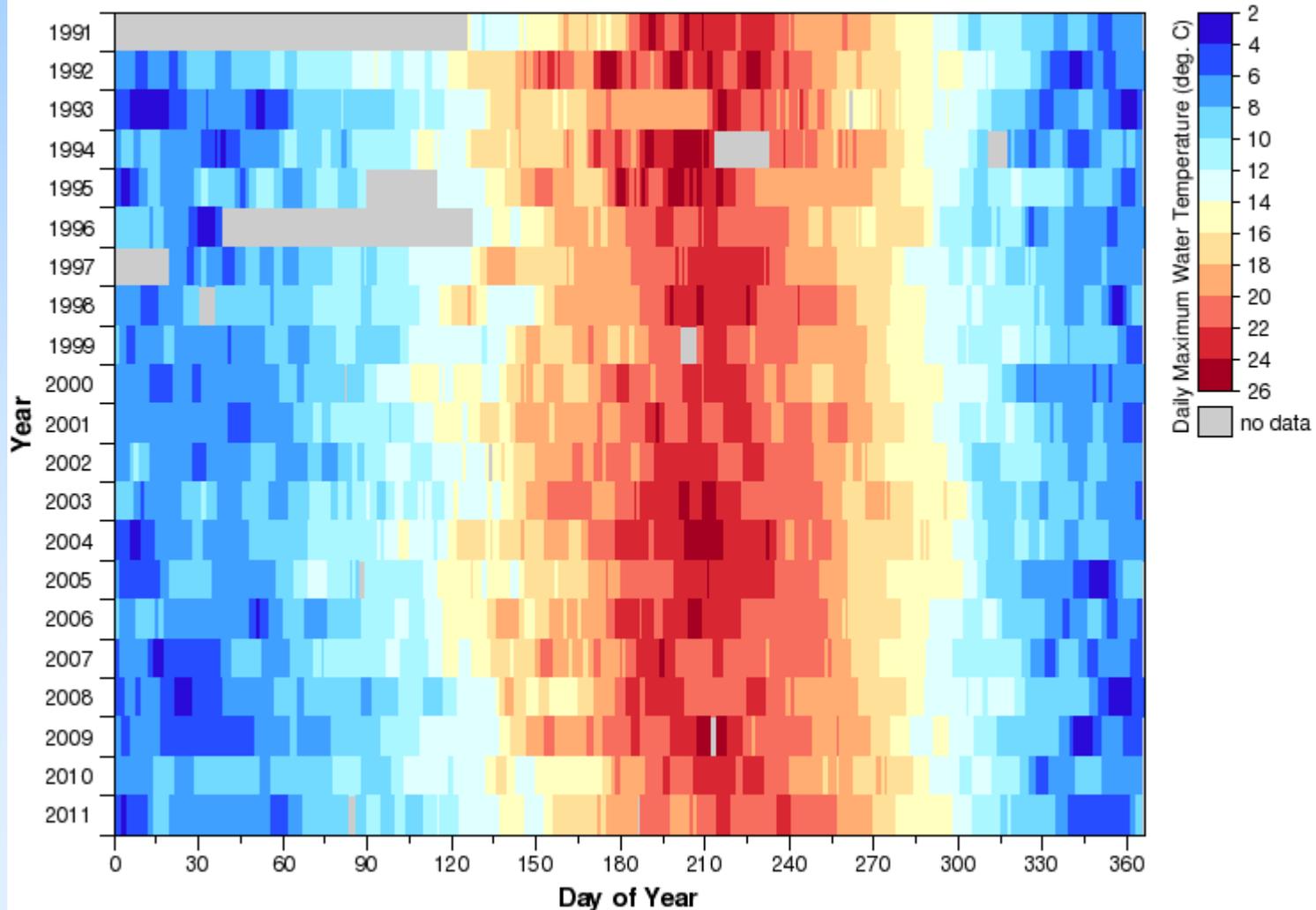


Year / Day-of-Year Color Map

Tualatin River at Oswego Diversion Dam (14207200)

Daily Maximum Water Temperature (deg. C)

Data from U.S. Geological Survey, Mar-07-1991 to Dec-31-2011

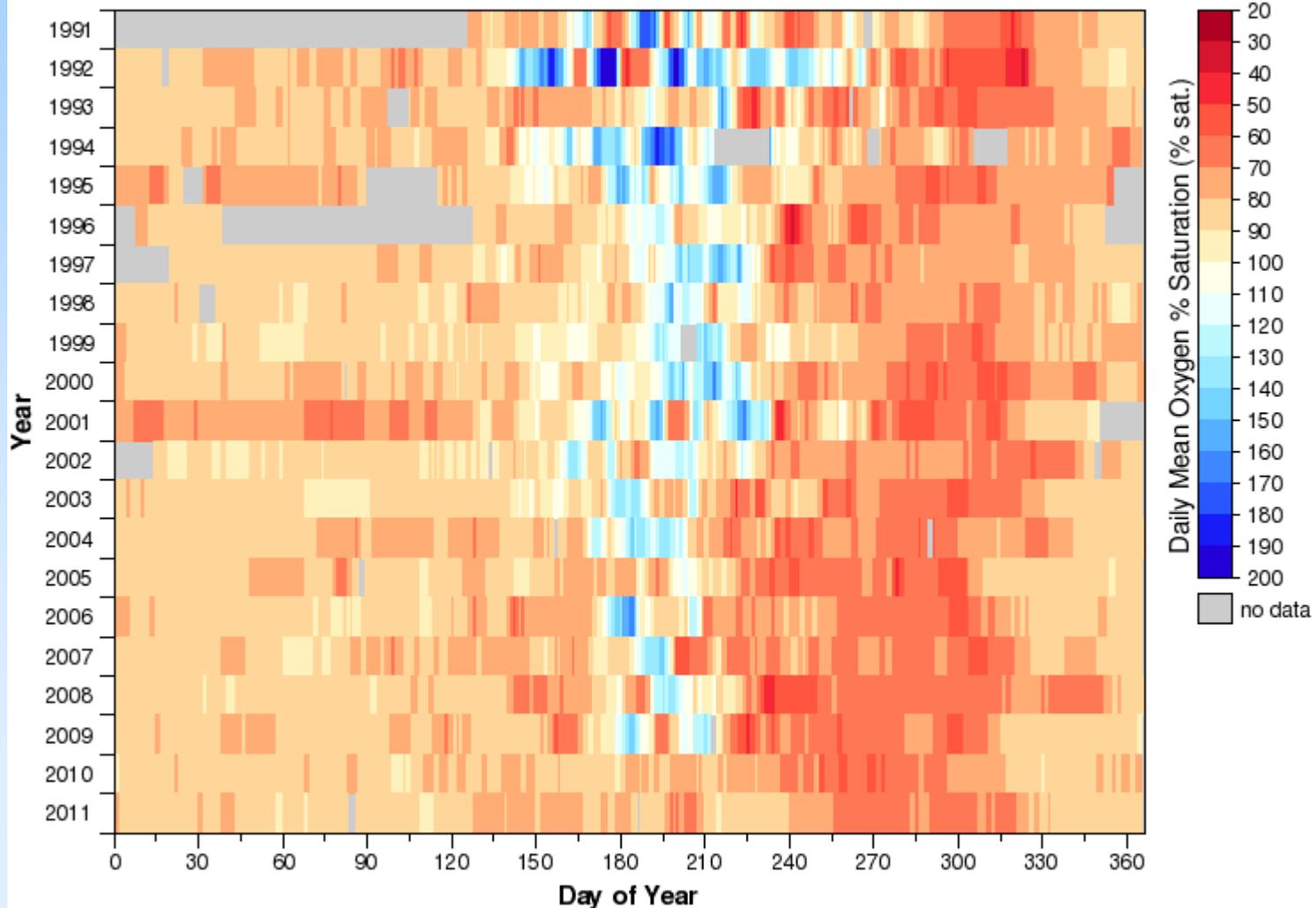


Year / Day-of-Year Color Map

Tualatin River at Oswego Diversion Dam (14207200)

Daily Mean Oxygen % Saturation (% sat.)

Data from U.S. Geological Survey, Mar-07-1991 to Dec-31-2011

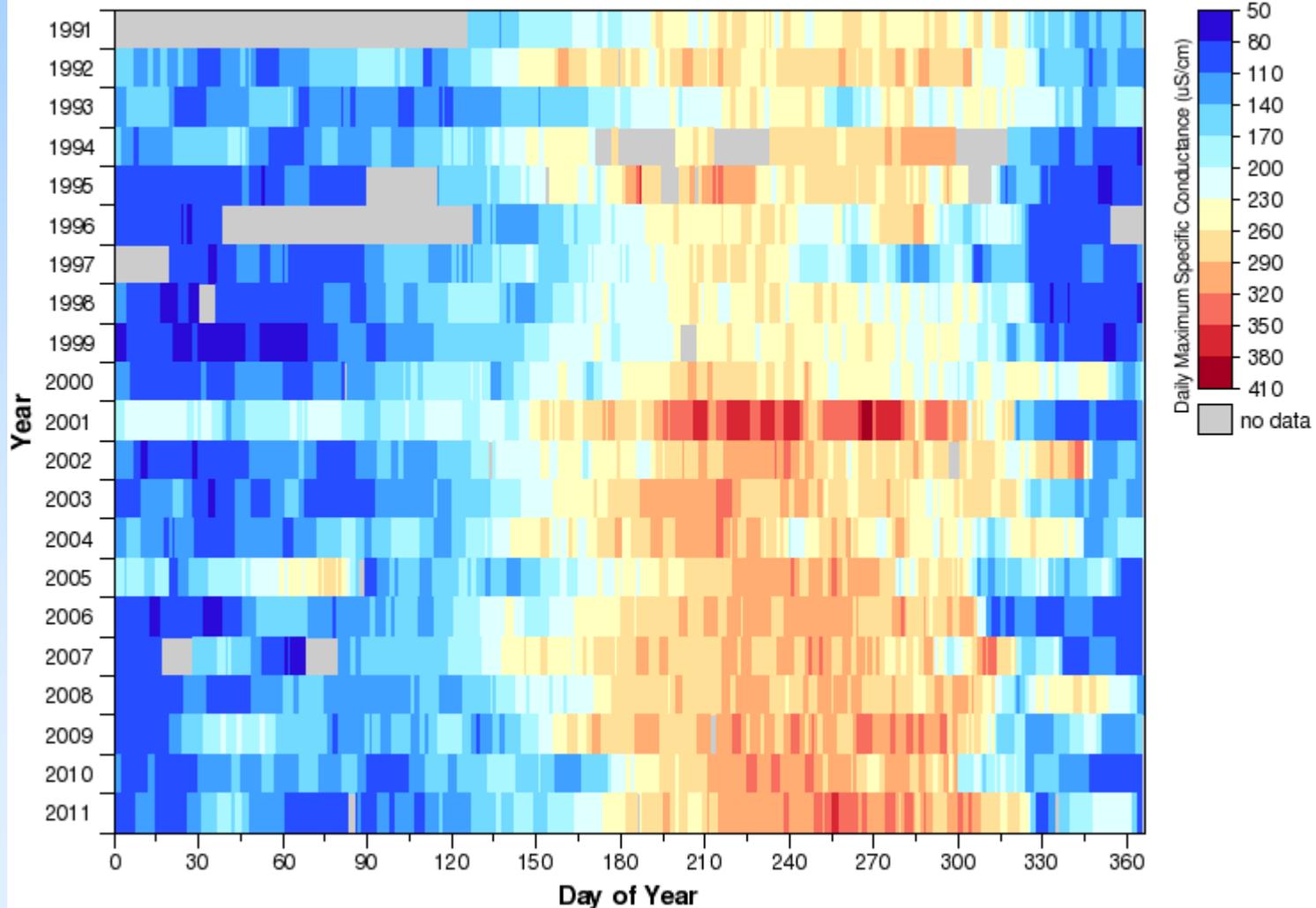


Year / Day-of-Year Color Map

Tualatin River at Oswego Diversion Dam (14207200)

Daily Maximum Specific Conductance (uS/cm)

Data from U.S. Geological Survey, Mar-07-1991 to Dec-31-2011

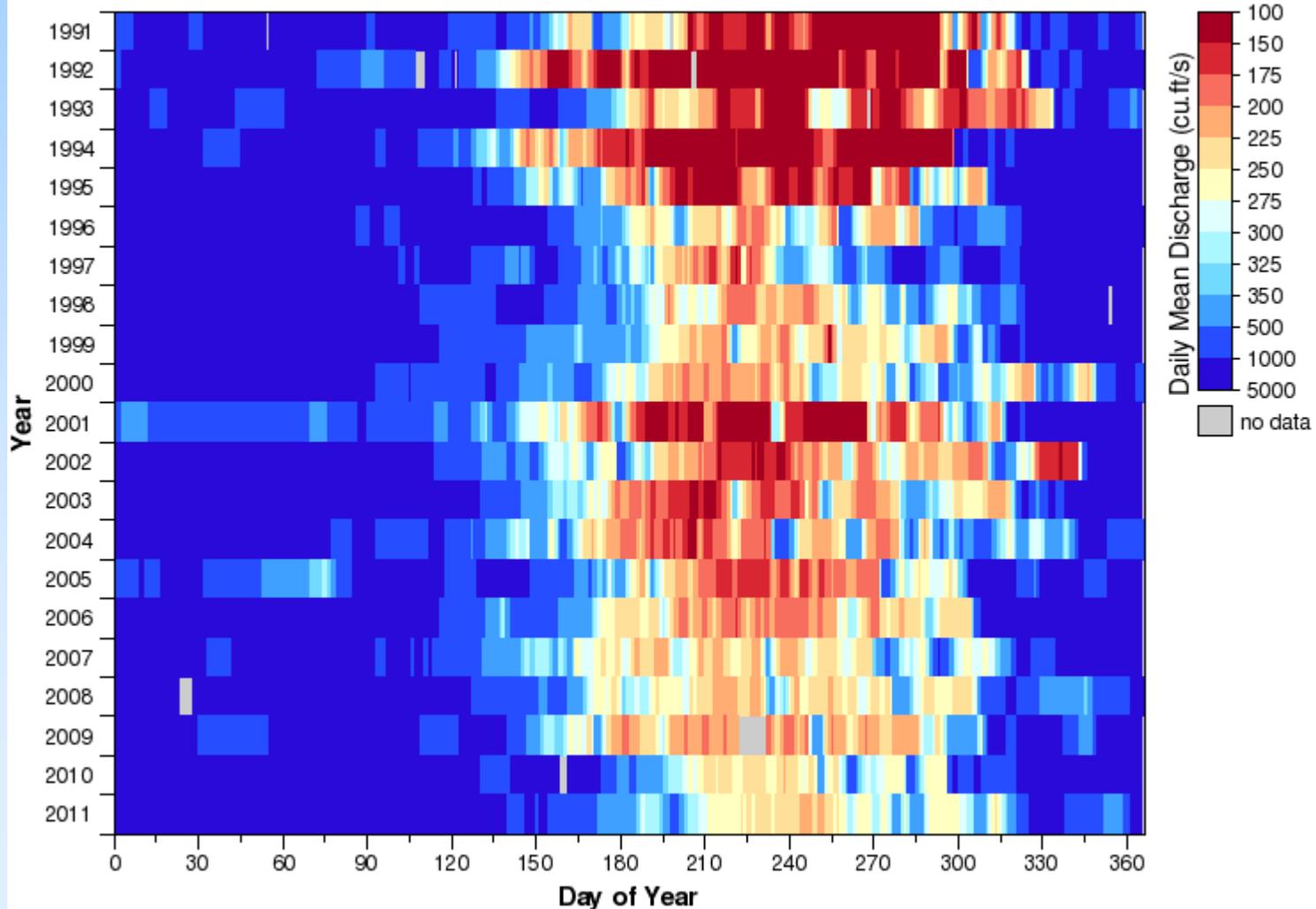


Year / Day-of-Year Color Map

Tualatin River at West Linn, OR (14207500)

Daily Mean Discharge (cu.ft/s)

Data from U.S. Geological Survey, Jan-01-1991 to Dec-31-2011



What's Next?

- One parameter, many sites, time-series graphs
- Map-based interface for site selection
- Time series with historical percentiles?
- Cumulative frequency plots?
- Begin to use web-services & expand to entire Nation
- Merge w/ USGS National Real-Time Water-Quality Network?

<http://or.water.usgs.gov/grapher>



The screenshot shows the top navigation bar of the USGS Oregon Water Science Center website. On the left is the USGS logo with the tagline "science for a changing world". The background features a scenic view of a lighthouse on a rocky island in the ocean. On the right, there are links for "USGS Home", "Contact USGS", and "Search USGS". Below this is a blue bar with the text "Oregon Water Science Center". At the bottom, a grey navigation bar contains the following links: "Data Grapher links:", "Home", "Time Series", "XY Graphs", "Polar Graphs", "Tables", and "Help".