



Continuous Water-Quality Monitoring of the Red River of the North and USGS Water Services

North Dakota Water Quality Monitoring Conference
February 27, 2012

Karen R. Ryberg

Continuous Water-Quality Monitoring of the Red River of the North



Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.



Specific Conductance
Temperature

Dissolved
Oxygen

pH

Turbidity



02/24/2012 11:59

Credit: U.S. Geological Survey/Art Lilienthal

Continuous Water-Quality Monitoring of the Red River of the North





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National Water Information System: Web Interface

USGS Water Resources (District Access)

Data Category: Home Geographic Area: United States GO

News updated November, 2011

USGS Water Data for the Nation

Data Category

- Real-time data** **Current-conditions** data transmitted from selected surface-water, groundwater, and water-quality sites.
- Site information** Descriptive site information for all sites with links to all available water data for individual sites.
- Surface water** Water flow and levels in streams, lakes, and springs.
- Groundwater** Water levels in wells.
- Water quality** Chemical and physical data for streams, lakes, springs, and wells.
- Mapper** Map of all sites with links to all available water data for individual sites.

Introduction

These pages provide access to water-resources data collected at approximately 1.5 million sites in all 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands. Online access to this data is organized around the categories listed to the left.

The USGS investigates the occurrence, quantity, quality, distribution, and movement of surface and underground waters and disseminates the data to the public, State and local governments, public and private utilities, and other Federal agencies involved with managing our water resources.

- About us
- Help
- Tutorial

Internal Access Only See this section.

- [\[NWISWeb Manual\]](#) [\[News\]](#) [\[FAQ\]](#) [\[NWIS-RT Home\]](#)

- [Questions about sites/data?](#)
- [Feedback on this web site](#)
- [Automated retrievals](#)
- [Help](#)

- [Data Tips](#)
- [Explanation of terms](#)
- [News](#)



http://waterdata.usgs.gov/

USGS 05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

Available data for this site

SUMMARY OF ALL AVAILABLE DATA

GO

Stream Site**DESCRIPTION:**

Latitude 47°55'37", Longitude 97°01'44" NAD27
 Grand Forks County, North Dakota, Hydrologic Unit 09020301
 Drainage area: 30,100 square miles
 Contributing drainage area: 26,300 square miles,
 Datum of gage: 779.0 feet above NGVD29.

Summary of All Available Data

AVAILABLE DATA:

| Data Type | Begin Date | End Date | Count |
|---|-------------------------|-----------------|--------------|
| Real-time | -- Previous 120 days -- | | |
| Daily Data | | | |
| Temperature, water, degrees Celsius | 1956-10-02 | 1973-09-30 | 6330 |
| Temperature, water, degrees Celsius | 2007-03-31 | 2012-02-23 | 4872 |
| Discharge, cubic feet per second | 1904-01-01 | 2012-02-23 | 39497 |
| Gage height, feet | 1979-03-01 | 2012-02-23 | 8127 |
| Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | 2007-03-31 | 2012-02-23 | 4668 |
| Dissolved oxygen, water, unfiltered, milligrams per liter | 2007-03-31 | 2012-02-23 | 4620 |
| pH, water, unfiltered, field, standard units | 2007-03-31 | 2012-02-23 | 4674 |
| Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units (FNU) | 2007-05-11 | 2012-02-23 | 4449 |
| Daily Statistics | | | |
| Temperature, water, degrees Celsius | 2007-03-31 | 2010-11-08 | 1183 |
| Discharge, cubic feet per second | 1904-01-02 | 2010-10-12 | 39001 |
| Gage height, feet | 1989-02-17 | 2010-10-12 | 5419 |
| Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | 2007-03-31 | 2010-11-08 | 1139 |
| Dissolved oxygen, water, unfiltered, milligrams per liter | 2007-03-31 | 2010-11-08 | 1123 |
| Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units (FNU) | 2007-05-11 | 2010-11-08 | 1086 |
| Monthly Statistics | | | |
| Temperature, water, degrees Celsius | 2007-03 | 2010-11 | |
| Discharge, cubic feet per second | 1904-01 | 2010-10 | |
| Gage height, feet | 1989-02 | 2010-10 | |
| Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | 2007-03 | 2010-11 | |
| Dissolved oxygen, water, unfiltered, milligrams per liter | 2007-03 | 2010-11 | |
| Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units (FNU) | 2007-05 | 2010-11 | |
| Annual Statistics | | | |
| Temperature, water, degrees Celsius | 2007 | 2011 | |
| Discharge, cubic feet per second | 1904 | 2011 | |
| Gage height, feet | 1989 | 2011 | |
| Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius | 2007 | 2011 | |
| Dissolved oxygen, water, unfiltered, milligrams per liter | 2007 | 2011 | |
| Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units (FNU) | 2007 | 2011 | |
| Peak streamflow | 1882-04-18 | 2010-03-20 | 129 |
| Field measurements | 1901-05-24 | 2012-02-06 | 1808 |
| Field/Lab water-quality samples | 1949-06-22 | 2011-10-11 | 1017 |
| Additional Data Sources | Begin Date | End Date | Count |
| Instantaneous-Data Archive **offsite** | 1994-10-01 | 2007-09-30 | 213198 |
| Annual Water-Data Report (pdf) **offsite** | 2006 | 2010 | 5 |

OPERATION:

Record for this site is maintained by the USGS North Dakota Water Science Center

Email questions about this site to [North Dakota Water Science Center Water-Data Inquiries](#)

Contact E-Mail

```

# ----- WARNING -----
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision. The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its use.
# Additional info: http://waterdata.usgs.gov/nd/nwis/help/?provisional
#
# File-format description: http://waterdata.usgs.gov/nwis/?tab_delimited_format_info
# Automated-retrieval info: http://waterdata.usgs.gov/nwis/?automated_retrieval_info
#
# Contact: gs-w_support_nwisweb@usgs.gov
# retrieved: 2012-02-24 13:44:52 EST (sdww01)
#
# Data for the following 1 site(s) are contained in this file
# USGS 05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND
# -----
#
# Data provided for site 05082500
# DD parameter statistic Description
# 01 00010 00001 Temperature, water, degrees Celsius (Maximum), [once daily measurement]
# 01 00010 00002 Temperature, water, degrees Celsius (Minimum), [once daily measurement]
# 01 00010 00004 Temperature, water, degrees Celsius (AM), [once daily measurement]
# 01 00010 00011 Temperature, water, degrees Celsius (Instantaneous), [once daily measurement]
# 02 00060 00003 Discharge, cubic feet per second (Mean)
# 05 00065 00003 Gage height, feet (Mean)
# 24 00010 00001 Temperature, water, degrees Celsius (Maximum)
# 24 00010 00002 Temperature, water, degrees Celsius (Minimum)
# 24 00010 00003 Temperature, water, degrees Celsius (Mean)
# 25 00095 00001 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius (Maximum)
# 25 00095 00002 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius (Minimum)
# 25 00095 00003 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius (Mean)
# 27 00300 00001 Dissolved oxygen, water, unfiltered, milligrams per liter (Maximum)
# 27 00300 00002 Dissolved oxygen, water, unfiltered, milligrams per liter (Minimum)
# 27 00300 00003 Dissolved oxygen, water, unfiltered, milligrams per liter (Mean)
# 28 00400 00001 pH, water, unfiltered, field, standard units (Maximum)
# 28 00400 00002 pH, water, unfiltered, field, standard units (Minimum)
# 28 00400 00008 pH, water, unfiltered, field, standard units (Median)
# 29 63680 00001 Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units
# 29 63680 00002 Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units
# 29 63680 00003 Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, formazin nephelometric units
#
# Data-value qualification codes included in this output:
# Ice Ice affected
# P Provisional data subject to revision.
# e Value has been estimated.
#

```

| agency_cd | site_no | datetime | 01_00010_00001 | 01_00010_00001_cd | 01_00010_00002 | 01_00010_00002_cd | 01_00010_00004 | 01_00010_00004_cd | 01_00010_00011 |
|-----------|----------|------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| 5s | 15s | 20d | 14n | 10s | 14n | 10s | 14n | 10s | 14n |
| USGS | 05082500 | 2011-02-23 | | | 3460 | P:e | 17.48 | P | 0.0 |
| USGS | 05082500 | 2011-02-24 | | | 3560 | P:e | 17.49 | P | 0.0 |
| USGS | 05082500 | 2011-02-25 | | | 3670 | P:e | 17.53 | P | 0.0 |
| USGS | 05082500 | 2011-02-26 | | | 3760 | P:e | 17.54 | P | 0.0 |
| USGS | 05082500 | 2011-02-27 | | | 3810 | P:e | 17.54 | P | 0.0 |
| USGS | 05082500 | 2011-02-28 | | | 3860 | P:e | 17.52 | P | 0.0 |
| USGS | 05082500 | 2011-03-01 | | | 3880 | P:e | 17.48 | P | 0.0 |
| USGS | 05082500 | 2011-03-02 | | | 3840 | P:e | | P | 0.0 |
| USGS | 05082500 | 2011-03-03 | | | 3790 | P:e | 17.44 | P | 0.0 |
| USGS | 05082500 | 2011-03-04 | | | 3650 | P:e | 17.41 | P | 0.0 |
| USGS | 05082500 | 2011-03-05 | | | 3510 | P:e | 17.39 | P | 0.0 |
| USGS | 05082500 | 2011-03-06 | | | 3440 | P:e | 17.40 | P | 0.0 |
| USGS | 05082500 | 2011-03-07 | | | 3370 | P:e | 17.42 | P | 0.0 |
| USGS | 05082500 | 2011-03-08 | | | 3350 | P:e | 17.45 | P | 0.0 |
| USGS | 05082500 | 2011-03-09 | | | 3330 | P:e | | P | 0.0 |
| USGS | 05082500 | 2011-03-10 | | | 3320 | P:e | | P | 0.0 |
| USGS | 05082500 | 2011-03-11 | | | 3300 | P:e | 17.51 | P | 0.0 |
| USGS | 05082500 | 2011-03-12 | | | 3300 | P:e | 17.51 | P | 0.0 |

USGS Water Services

- Water services site: <http://waterservices.usgs.gov>
- Current services
 - Instantaneous values web service (up to 120 days)
 - Site information web service
 - Daily values web service
 - Water quality web service
- Source of data: USGS National Water Information System same as <http://waterdata.usgs.gov>

Instantaneous Values Web Service

- <http://waterservices.usgs.gov/rest/IV-Service.html>
- Current and recent instantaneous values for USGS real-time site (up to 120 days)
- Hardened – same data is hosted from three service centers
- Scalable – designed to handle demand during peak periods (floods, hurricanes etc.)

Instantaneous Values Web Service

- Multi-site queries allowed:
 - Up to 100 specified real-time sites
 - All real-time sites for a state
 - All real-time sites for up to 20 counties
 - All real-time sites within a Latitude/Longitude box

Continuous Water-Quality Monitoring of the Red River of the North



<http://water.usgs.gov/wateralert/>

Or Google “USGS Water Alert”

Water Alert

USGS WaterAlert

The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when [certain parameters](#), as measured by a USGS real-time data-collection station, exceed user-definable thresholds. The development and maintenance of the WaterAlert system is supported by the USGS and its partners, including numerous federal, state, and local agencies.

Real-time data from USGS gages are transmitted via satellite or other telemetry to USGS offices at various intervals; in most cases, once every 1 or 4 hours. Emergency transmissions, such as during floods, may be more frequent. *Notifications will be based on the data received at these site-dependent intervals.*

Instructions





SITE SELECTION


State or Territory


(select one or more)

- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma


Data Type

-  Surface Water
-  Groundwater
-  Water Quality
-  Precipitation

 = water-quality site





 **Site Number: [05054000](#)**

RED RIVER OF THE NORTH AT FARGO, ND

As of 2012-02-27 07:15:00 CST

| | | |
|------------------------------|---|------|
| Temperature, water (deg C) | = | 0.0 |
| Specific cond at 25C (uS/cm) | = | 814 |
| Dissolved oxygen (mg/l) | = | 10.5 |
| pH (std units) | = | 7.9 |
| Turbidity, Form Neph (FNU) | = | 5.2 |





Subscription Form

Site Info:

Site Number: 05054000
Site Name: RED RIVER OF THE NORTH AT FARGO, ND
Agency: USGS
Transaction ID: NqkfB

Send Notification To:

My mobile phone
 My email address

Notification Frequency:

Hourly
Daily

Water-Quality Data-type Parameter:

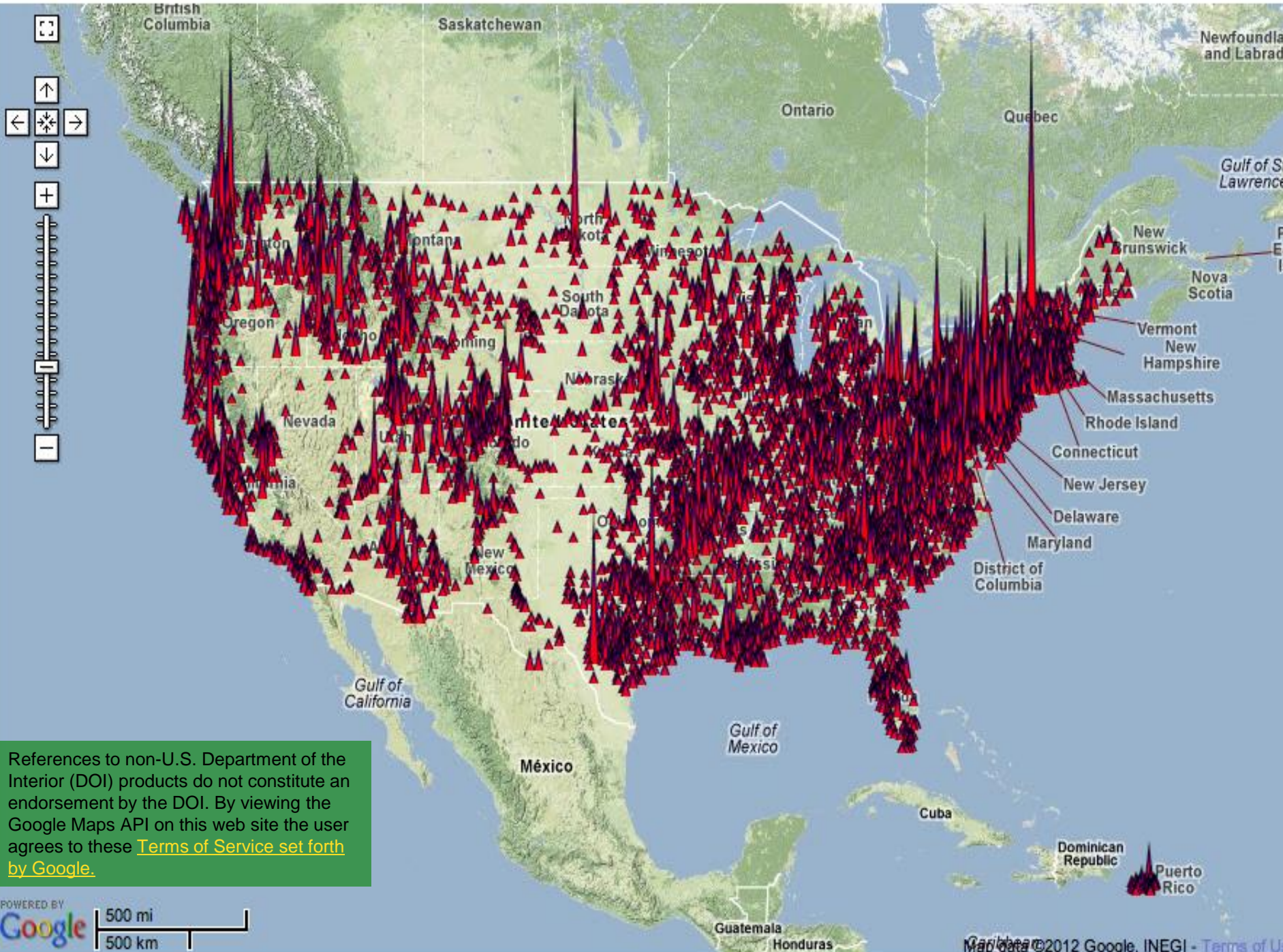
| | about this... | Recent value: |
|------------------------------|----------------------------------|---------------|
| Temperature, water (deg C) | <input type="radio"/> | 0.0 |
| Specific cond at 25C (uS/cm) | <input type="radio"/> | 814 |
| Dissolved oxygen (mg/l) | <input checked="" type="radio"/> | 10.5 |
| pH (std units) | <input type="radio"/> | 7.9 |
| Turbidity, Form Neph (FNU) | <input type="radio"/> | 5.2 |

Threshold Condition:

Greater than (>)
 Less than (<)
 Outside a range (< or >)
 Inside a range (> and <)

Real-time value is less than: mg/l

I have read and acknowledge the [Provisional Data Statement](#) and [Disclaimer](#).

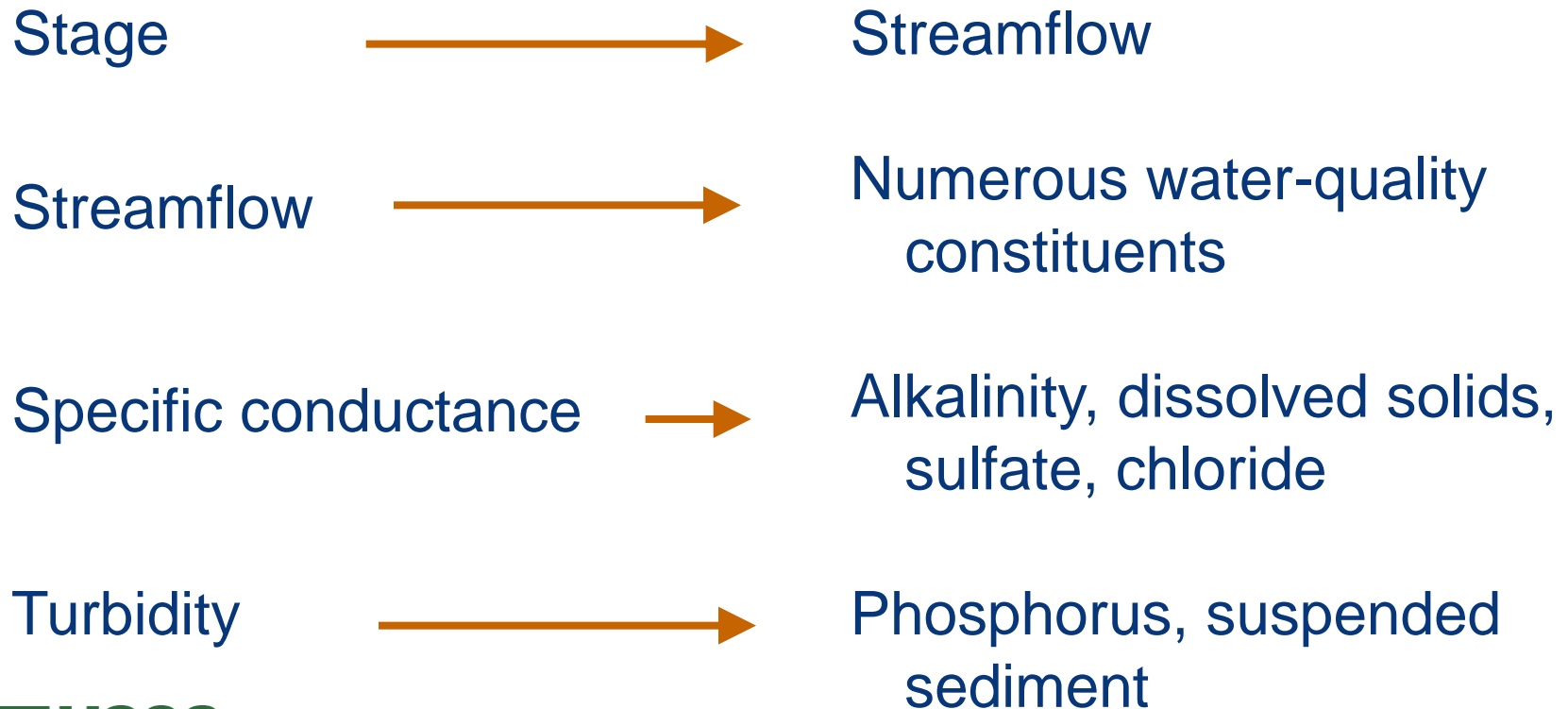


References to non-U.S. Department of the Interior (DOI) products do not constitute an endorsement by the DOI. By viewing the Google Maps API on this web site the user agrees to these [Terms of Service set forth by Google.](#)

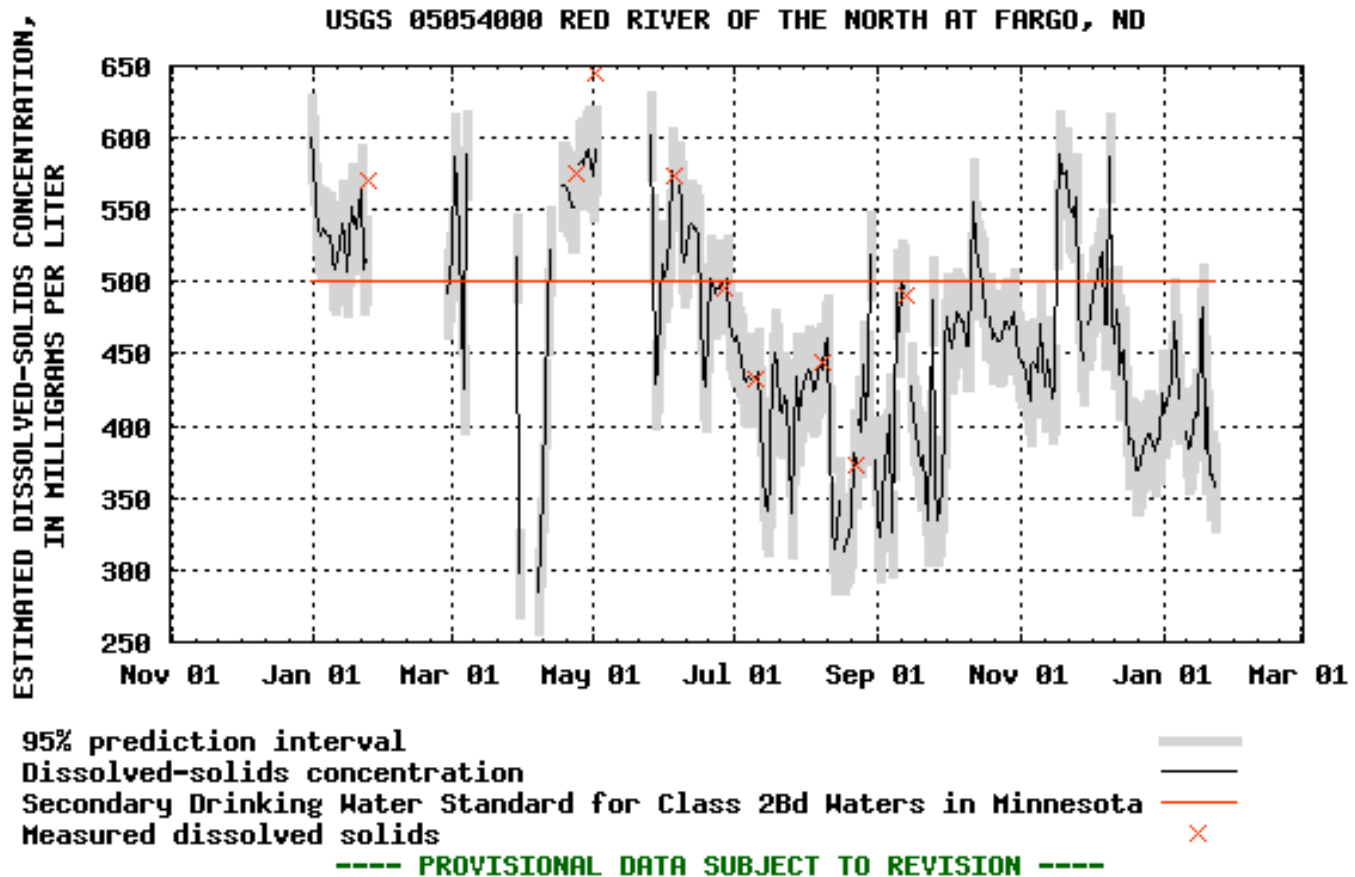
<http://nd.water.usgs.gov/cgi-bin/redriver/rtqw.pl>

Continuous Water-Quality Estimates

Prediction From Continuous Monitoring

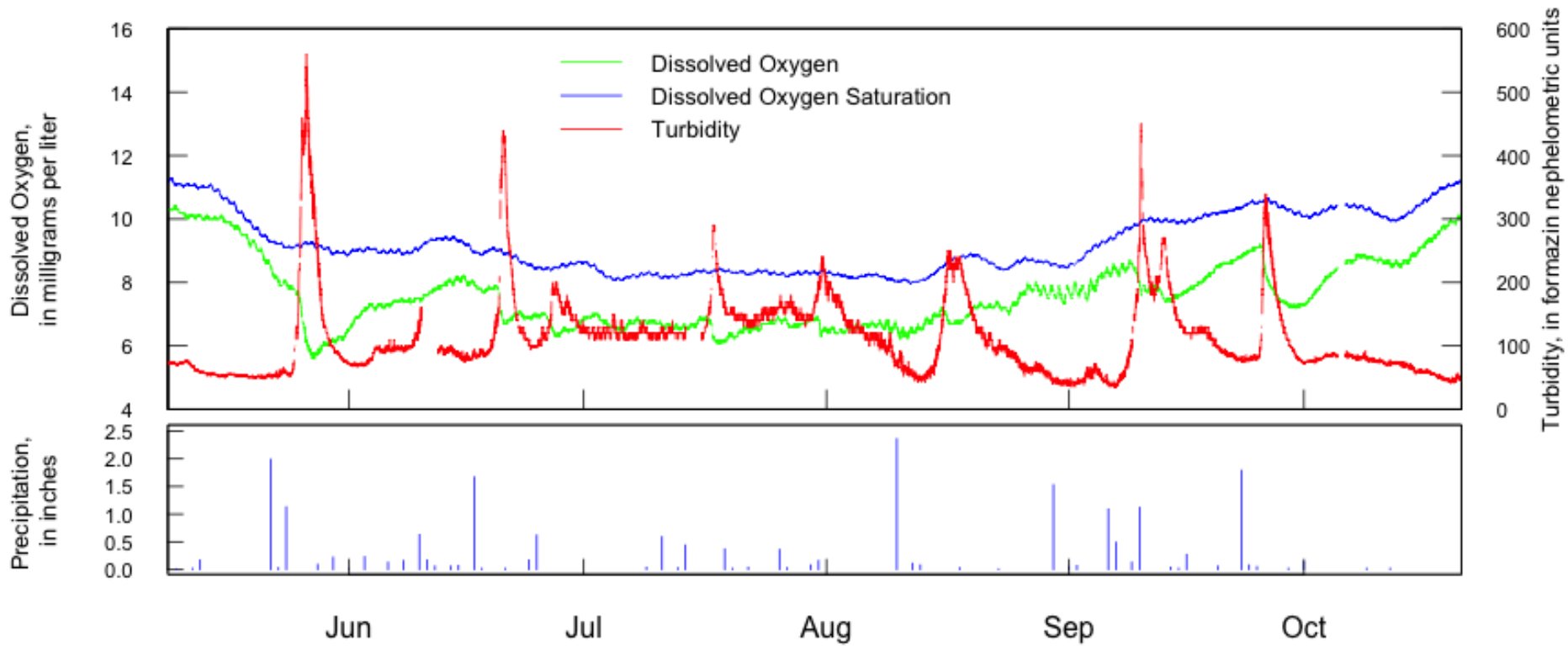


Estimated Dissolved Solids Concentration and Error Bounds



Monitoring the State of the River

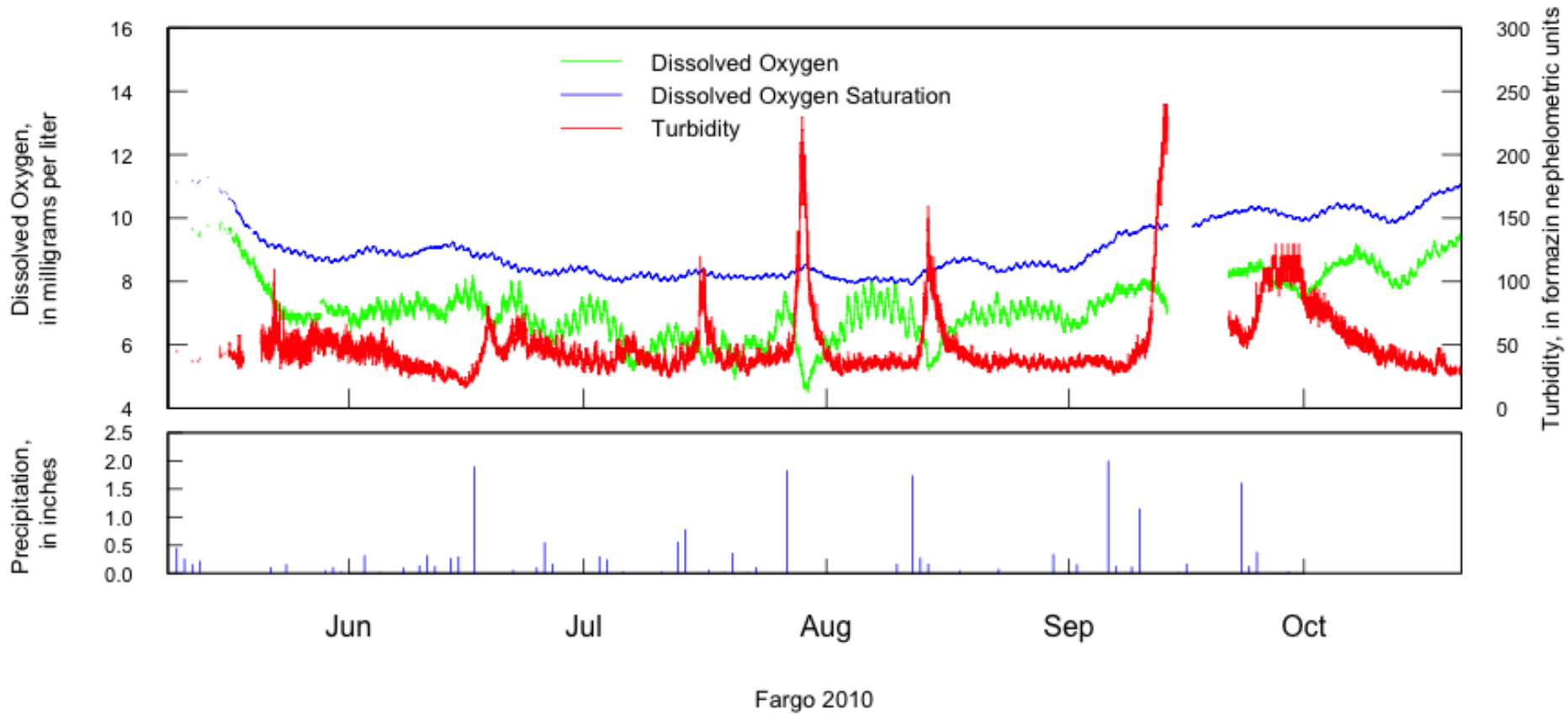
Grand Forks May 15 – Nov 15 2010



Grand Forks 2010

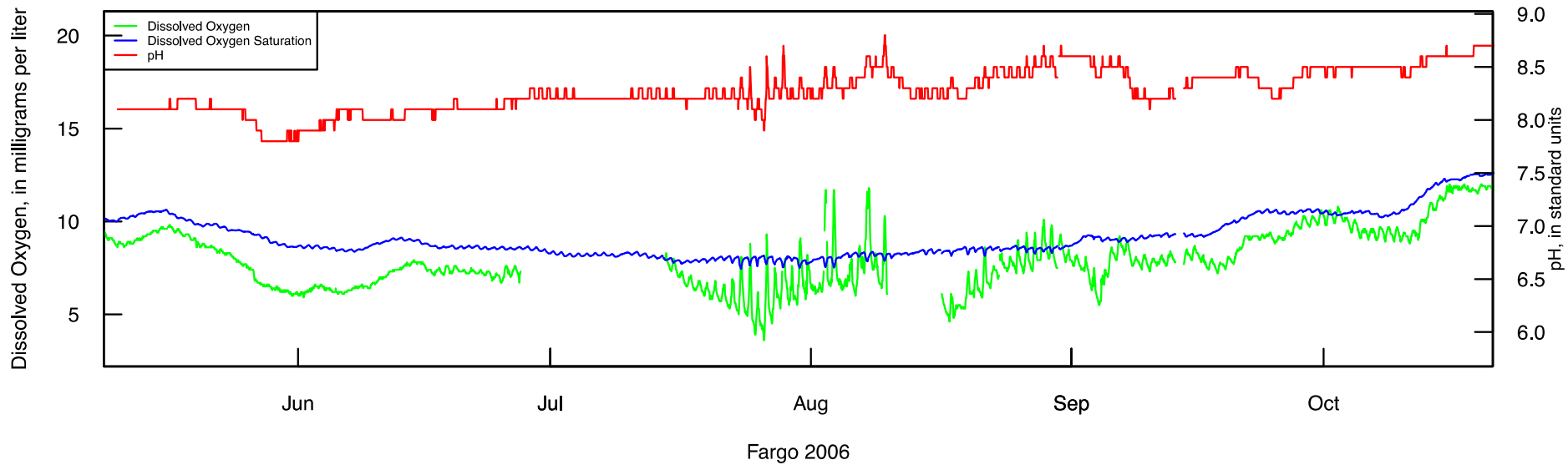
Fargo

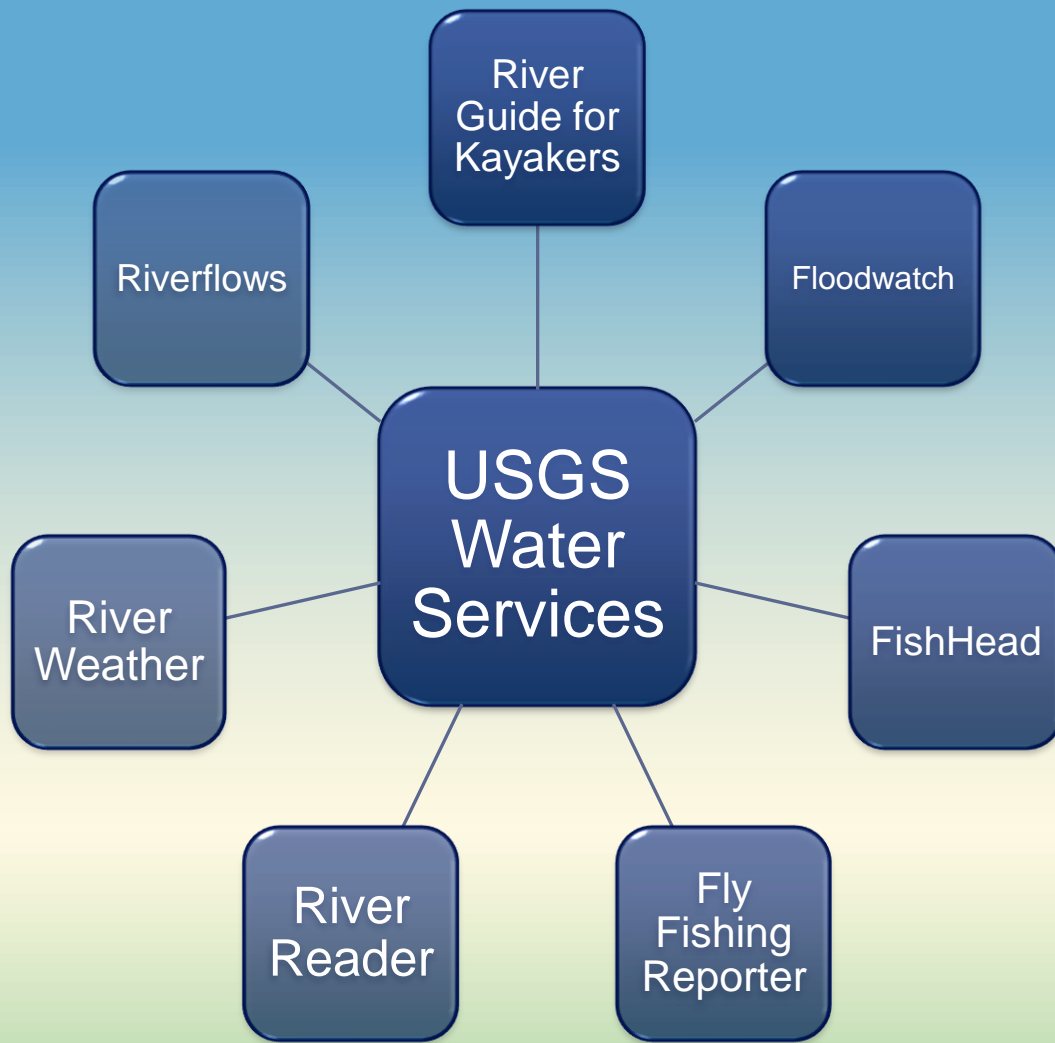
May 15 – Nov 15 2010



Fargo

May 15 – Nov 15 2006





Apps

Links to non-USGS sites - Links and pointers to non-USGS sites are provided for information only and do not constitute endorsement by the USGS, U.S. Department of the Interior, or U.S. Government, of the referenced organizations, their suitability, content, products, or services, whether they are governmental, educational, or commercial. Some of the documents on this server may contain live references (or pointers) to information created and maintained by other organizations. Please note that the USGS does not control and cannot guarantee the relevance, timeliness, or accuracy of these outside materials.

List available at

<http://waterservices.usgs.gov/examples/showcase.html>



Credit: U.S. Geological Survey/Victoria Christensen



03/01/2010

Credit: U.S. Geological Survey

Brought to You By Cooperators

- North Dakota Department of Health
- Minnesota Pollution Control Agency
- City of East Grand Forks
- City of Fargo
- City of Grand Forks
- City of Moorhead