



United States Department of Agriculture

Natural Resources Conservation Service

USDA-NRCS

Geospatial Tools for Dam Safety

2014 Interagency Flood Risk Management Project Workshop

August 20, 2014

Presented by: Kevin Farmer, State Conservation Engineer
USDA-NRCS, Warwick, RI

NRCS Watershed Projects

Since 1948, NRCS Constructed:

- 11,900 dams in 1,300 watersheds in 47 states

Watershed projects provide \$2 billion in annual benefits, with the primary benefits coming from dams

NRCS Watershed Rehabilitation Program

Since 2002:

- 215 approved projects in 26 states
- 127 projects (dams) with rehabilitation completed
- 51 projects in implementation phase
- 37 projects in planning

Hazard Class Change

NRCS has 11,900 Project Dams

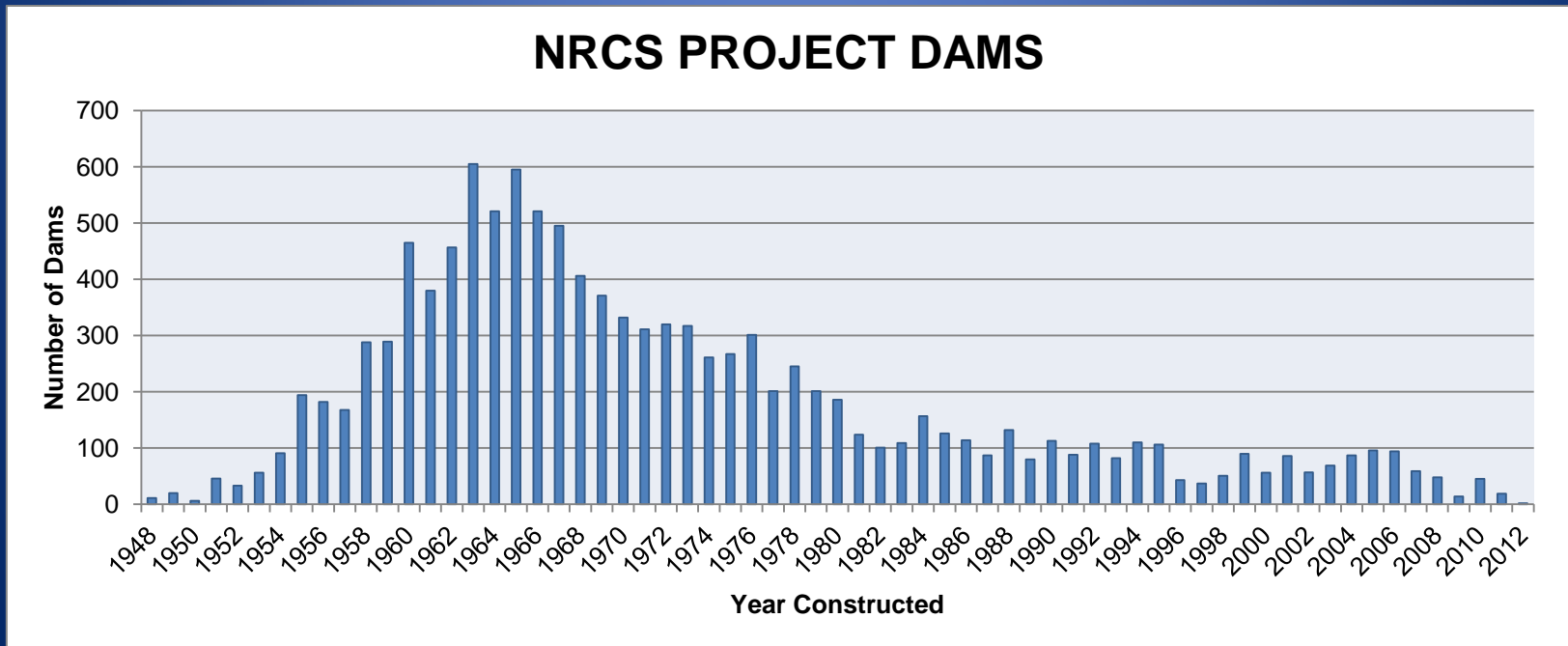
978 originally designed as high hazard
2,088 currently classified as high hazard



Aging Infrastructure

The peak of dam construction was 1963

In 2014, 3,720 dams will reach their 50 year life



NRCS Dam Safety Efforts

Membership and partnership with:

- Interagency Committee on Dam Safety (ICODS)
- National Dam Safety Review Board (NDSRB)
- Association of State Dam Safety Officials (ASDSO)
- Federal Emergency Management Agency (FEMA)
- USDA Dam Safety Committee
- National Watershed Coalition
- National Association of Conservation Districts
- American Society of Civil Engineers

Technical assistance:

- Policy, development, guidance, direct assistance
- Geospatial data management – DamWatch and GeoObserver

NRCS – GeoObserver for Dams

A Geospatial Database

- Developed by the NRCS National Geospatial Center of Excellence for internal use by NRCS personnel.
- Provides National Inventory of Dam data for over 29,000 NRCS dams throughout the United States
- Allows uniform method for NRCS personnel to track key data on dams
- Is synchronized with NRCS DamWatch to provide consistent data for both platforms.

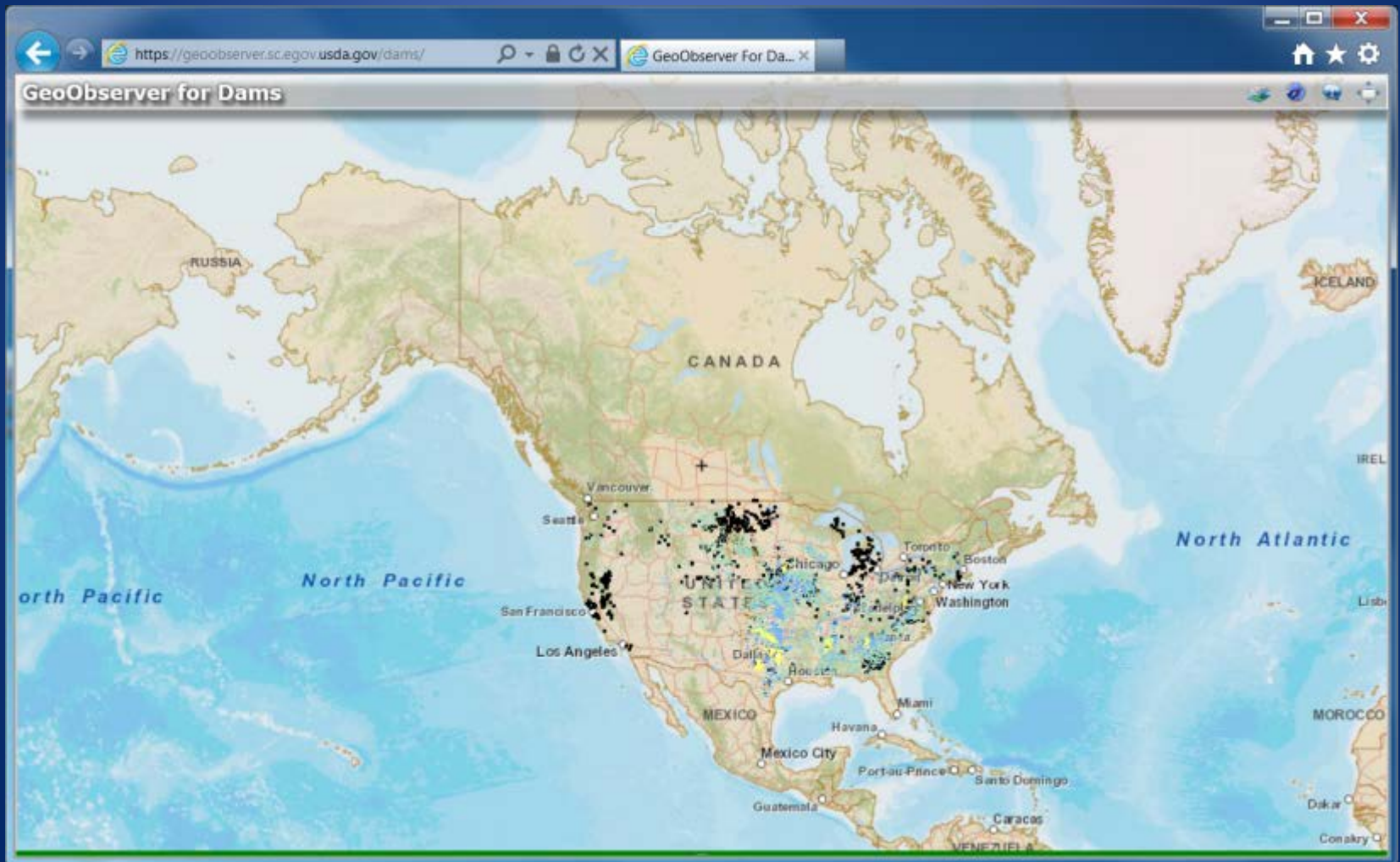
NRCS GeoObserver for Dams

Benefits to NRCS



- Important attributes of dams are stored in one location
- Allows updating of information on dams as changes occur
- Provides key information about dams to key personnel throughout agency
- Allows for accurate reporting of information on NRCS dams to the US Army Corps of Engineers for the National Inventory of Dams

NRCS GeoObserver for Dams National View



NRCS GeoObserver for Dams State View

GeoObserver for Dams

Filters For Dam

State: Virginia

County: Select from Counties

Dam:

Layer List Legend

- Base Layer
 - World Street Map
- Selected Graphic
 - Dams
- Dams by Authority
 - WS
 - PT
 - RC
 - FP
 - CD
 - GP
 - OT
 - No Value

Dams Details

| ST_NAME | DAM_NAME | OTHER_NAMES | FORMER_NAMES | FED_ID | NID_ID | LONG_DEG | LAT_DEG | GEODETIC_LOC | COUNTY | STREAM | NEARES |
|----------|-------------------|-------------|--------------|----------|---------|--------------|-------------|--------------|---------|-------------------|---------|
| Virginia | POPLAR FOREST DAM | | | VA-01914 | VA01914 | -79.26929997 | 37.34868928 | | BEDFORD | TR-TOMAHAWK CREEK | N.W. RR |

Record: <<< 0 >>> Records (0 out of 1649 Selected) Options... Commit

NRCS GeoObserver for Dams County View

GeoObserver for Dams

Filters For Dam

State: Virginia

County: Fairfax

Dams: Select from Dams

Layer List

Legend

Base Layer

World Street Map

Selected Graphic

Dams

Dams by Authority

WS

PT

AC

FP

CG

GP

OT

No Value

Dams Details

| ST_NAME | DAM_NAME | OTHER_NAMES | FORMER_NAMES | FED_ID | NID_ID | LONG_DEG | LAT_DEG | GEODETIC_LOC | COUNTY | STREAM | NEAR |
|----------|--------------------|-----------------|--------------|----------|---------|--------------|-------------|--------------|---------|--------------------|------|
| Virginia | WOODALL DAM | | | VA-10717 | VA10717 | -77.62651451 | 39.01821521 | | LOUDOUN | TR-GOOSE CREEK | EVEE |
| Virginia | CHERRY HILL DAM | | | VA-10724 | VA10724 | -77.65643118 | 38.99157494 | | LOUDOUN | TR-LITTLE RIVER | ALDI |
| Virginia | QUAIL RIDGE DAM | | | VA-10720 | VA10720 | -77.55749198 | 38.95403934 | | LOUDOUN | TR-BROAD RUN | ARC |
| Virginia | POHOCK CREEK NO. 4 | LAKE ROYAL | | VA-594 | VA05922 | -77.28826631 | 38.80190274 | | FAIRFAX | RABBIT BRANCH | |
| Virginia | POHOCK CREEK NO. 3 | WOODGLEN LAKE | | VA-593 | VA05928 | -77.31225798 | 38.80257701 | | FAIRFAX | SIDEBURN BRANCH | |
| Virginia | CEDAR RUN NO. 4 | GERMANTOWN LAKE | | VA-264 | VA06144 | -77.72433498 | 38.61709201 | | FAUQUER | LICKING RUN | |
| Virginia | POHOCK CREEK NO. 7 | LAKE BRADDOCK | | VA-597 | VA05905 | -77.27237988 | 38.79945637 | | FAIRFAX | TR-POHOCK CREEK | |
| Virginia | POHOCK CREEK NO. 2 | LAKE BARTON | | VA-592 | VA05923 | -77.30809405 | 38.79618054 | | FAIRFAX | TR-SIDEBURN BRANCH | |
| Virginia | BELL DAM | | | VA-10718 | VA10718 | -77.65462918 | 39.00220721 | | LOUDOUN | TR-LITTLE RIVER | STAT |
| Virginia | POHOCK CREEK NO. 8 | HUNTSMAN LAKE | | VA-581 | VA05907 | -77.2553536 | 38.75433493 | | FAIRFAX | MIDDLE RUN | |
| Virginia | POHOCK CREEK NO. 1 | LAKE MERCER | | VA-591 | VA05929 | -77.25474278 | 38.73857721 | | FAIRFAX | SOUTH RUN | |
| Virginia | FOX DAM | | | VA-06117 | VA06117 | -77.79840876 | 38.77077861 | | FAUQUER | TR-CEDAR RUN | WAR |

Record: << < > >> Records (0 out of 52 Selected) Options... Cancel

NRCS GeoObserver for Dams Structure View

The screenshot displays the GeoObserver for Dams web application interface. The main map shows a satellite view of a dam structure, with a blue crosshair indicating the current location. The interface includes several panels:

- Filters For Dam:** A panel on the left with tabs for Filters, Attributes, Reports, and Help. It contains dropdown menus for State (Virginia), County (Fairfax), and Dams (POHICK CREEK NO. 4).
- Layer List:** A panel on the right showing the current map layers, including Imagery and Dams by Authority.
- Dams by Authority:** A legend on the right showing various authority codes (WS, PT, RC, FP, CO, GP, OT, No Value) with corresponding colored dots.
- Dams Details:** A table at the bottom showing the details for the selected dam.

| ST_NAME | DAM_NAME | OTHER_NAMES | FORMER_NAMES | FED_ID | NID_ID | LONG_DEG | LAT_DEG | GEOETIC_LOC | COUNTY | STREAM |
|----------|--------------------|-------------|--------------|--------|---------|--------------|-------------|-------------|---------|---------------|
| Virginia | POHICK CREEK NO. 4 | LAKE ROYAL | | VA-594 | VA05922 | -77.28826631 | 38.80190274 | | FAIRFAX | RABBIT BRANCH |

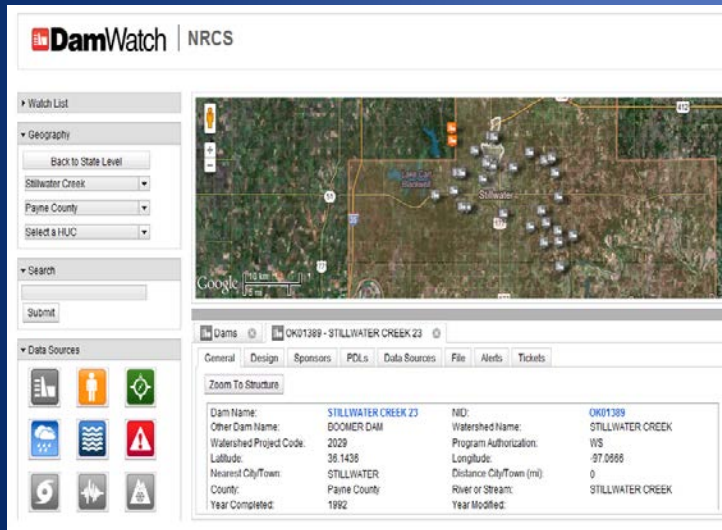
Record: <<< 1 >>> Records (1 out of 1 Selected) Options... Commit

GeoObserver Implementation

- Testing completed by 6 states
 - Massachusetts
 - West Virginia
 - Missouri
 - Kansas
 - Oklahoma
 - Utah
- Geospatial Center of Excellence completed updates
- Deployment and training to states anticipated for August
- Geospatial Center of Excellence will continue support

NRCS - DamWatch®

A Web-Based Dam Monitoring Tool



The screenshot displays the DamWatch web application interface. The top left corner features the DamWatch logo and the NRCS logo. The interface is divided into several sections:

- Watch List:** A section for managing the list of dams to monitor.
- Geography:** A section for filtering results by location, including a "Back to State Level" button, a dropdown for "Stillwater Creek", a dropdown for "Payne County", and a dropdown for "Selected HUC".
- Search:** A search bar with a "Submit" button.
- Data Sources:** A section with various icons representing different data sources.
- Map:** A satellite map showing the location of the dam in Stillwater Creek, Oklahoma.
- Dam Details:** A table providing information for the selected dam, "OK01389 - STILLWATER CREEK Z3".

| Zoom To Structure | | | |
|-------------------------|---------------------|--------------------------|------------------|
| Dam Name: | STILLWATER CREEK Z3 | NID: | OK01389 |
| Other Dam Name: | BOOMER DAM | Watershed Name: | STILLWATER CREEK |
| Watershed Project Code: | 2029 | Program Authorization: | WS |
| Latitude: | 36.1436 | Longitude: | -97.0986 |
| Nearest City/Town: | STILLWATER | Distance City/Town (mi): | 0 |
| County: | Payne County | River or Stream: | STILLWATER CREEK |
| Year Completed: | 1992 | Year Modified: | |

- USEngineering Solutions (USES) developed DamWatch® through an agreement with NRCS.
- Provides NRCS sponsors with real-time monitoring of 11,900 NRCS dams throughout the United States
- Alerts essential personnel when dams are experiencing potential threats from rainfall, snowmelt, earthquake, or other factors
- Provides a “one-stop” source for critical documents for dams such as drawings, historic photographs, and emergency action plans (EAPs).

NRCS DamWatch® Benefits to NRCS



- Important documents for watershed project dams electronically stored and readily available
 - ✓ Emergency action plans
 - ✓ Watershed work plans
 - ✓ Drawings
 - ✓ Photos
 - ✓ Inspection reports
 - ✓ Etc.
- Continuous monitoring of each dam
- Access to rainfall alerts, USGS gages, seismic alerts
- Captures data from other devices

More Benefits to NRCS



- Allows timely and effective assistance to project sponsors
- NRCS personnel remain familiar with NRCS project dams
- Strengthens project sponsor and state dam safety programs
- Critical information readily available
- Allows tracking of performance and maintenance history

DamWatch[®] Implementation

- Successfully piloted and operational in Oklahoma for 3 years
- National version testing underway in 6 states
 - Massachusetts
 - West Virginia
 - Missouri
 - Kansas
 - Oklahoma
 - Utah
- Information Technology Center (ITC) working with USES on updates
- Testing by states ongoing
- Deployment and training to states anticipated for late September
- ITC and USES will continue support