



U.S. Fish & Wildlife Service

# FWS Geospatial Strategy

By Chris Lett

National GIS Coordinator for the FWS  
Geospatial and Data Management Team  
Branch of Communication Technology

Information Resources and Technology Management





U.S. Fish & Wildlife Service

# FWS Geospatial Strategy

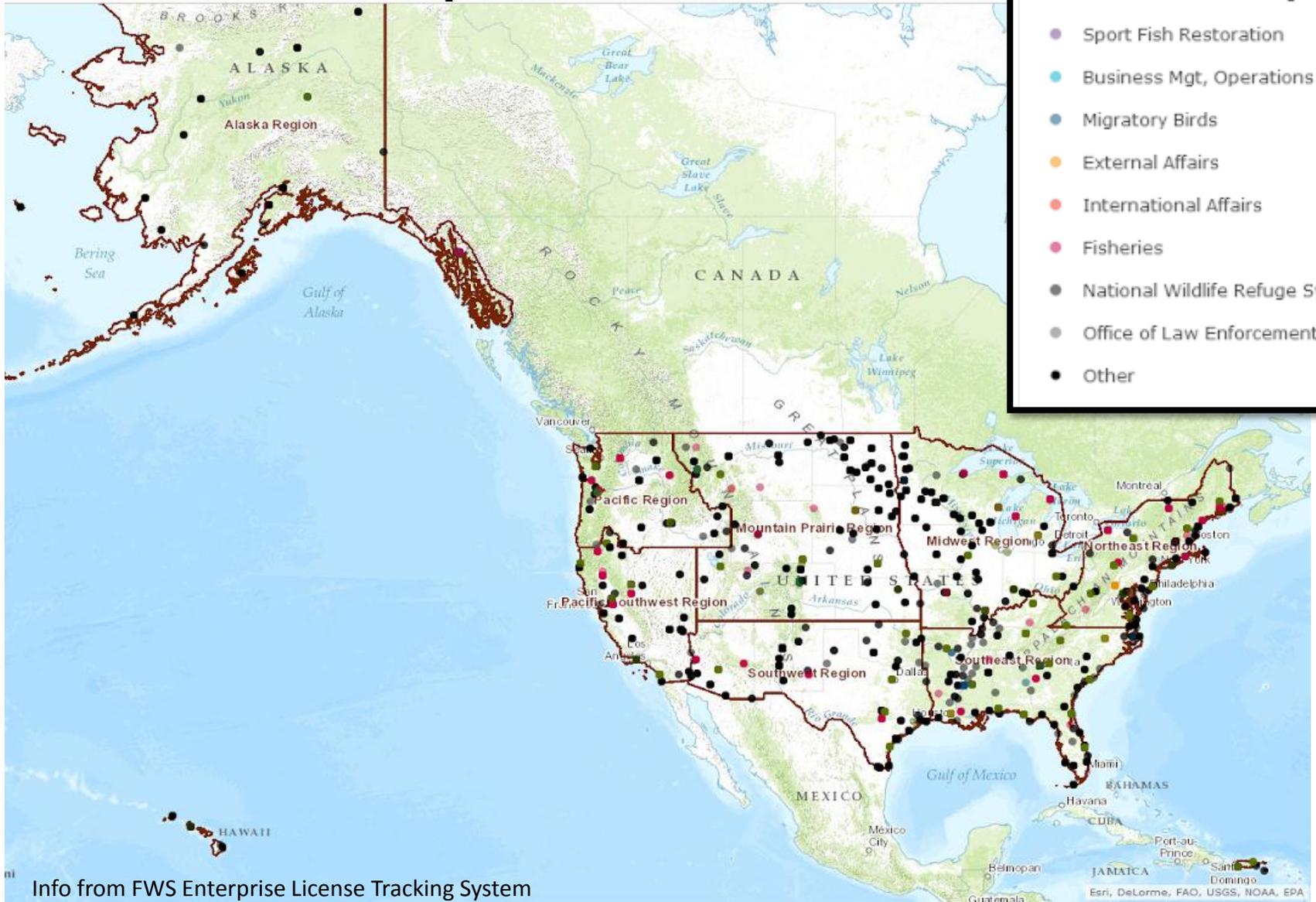
## Agenda

- Geospatial Strategy
- GIS Steering Committee
- Task Groups
- Web Mapping



# FWS Geospatial Software Users

- Ecological Services
- Info Resources Tech Mgt
- Sport Fish Restoration
- Business Mgt, Operations
- Migratory Birds
- External Affairs
- International Affairs
- Fisheries
- National Wildlife Refuge System
- Office of Law Enforcement
- Other



# FWS GIS Steering Committee - Regional

## Region 1

David Drescher  
Alternate  
Refuges

## Region 2

Cinthia Eichornn  
Acting  
Refuges

## Region 3

Mary Balogh  
NWRS

## Region 4

Jason Duke  
Sci App

## Region 5

BJ Richardson  
Acting  
Sci App

## Region 6

Linda Moeder  
Acting  
Refuges

## Region 7

Dawn Magness  
Acting  
Refuges

## Region 8

Pat Lineback  
Sci App

# FWS GIS Steering Committee - Programs

**National GIS  
Coordinator  
Chris Lett**

**NWRS GIS  
Coordinator  
TBD**

**Chief  
Cartographer  
Ron Salz**

**Science  
Applications  
Vacant**

**Ecological  
Services  
Vacant**

**Migratory  
Birds  
Mark Parr**

**Fire  
Management  
Camren  
Tongier**

**NCTC  
Mark  
Richardson**

**Fisheries  
Mitch Bergeson**

**Wildlife & Sport  
Fish Restoration  
Dan Hogan**

**Field Rep  
Cobb  
McCrea**

**Refuges I&M  
Todd  
Sutherland**



U.S. Fish & Wildlife Service

## FWS Geospatial Services National Office

HQ, Information Resources and Technology Management,  
Branch of Communication Technology, Geospatial and Data  
Services Team

- **Chris Lett** – National GIS coordinator, chair steering Committee, Team Lead
- **Kenny Elsner** – remote sensing, GPS & mobile, data.gov POC, IT Shared Costs, more
- **Doug Steinshouer** – metadata, license servers, software, install guides, help desk, & more
- **Matt Faruolo** – ¼ time – help desk, handouts, list serve, internet, license server backup & more





Enter Search Term(s):

Search

## USFWS Geospatial Services

Bison Photo Credit: Ryan Haggerty

Sunrise Photo Credit: Steve Hillbrand

### DATA & STANDARDS

[USFWS National GIS Data](#)

[USFWS Regional Data Sites](#)

[Metadata](#)

[Data Standards](#)

### APPLICATIONS

[EDUCATION & OUTREACH](#)

[POLICY](#)

[LINKS](#)

[CONTACTS](#)

### GEOSPATIAL SERVICES

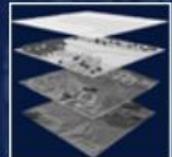
Geospatial data and services are critical elements needed to meet the mission of the U.S. Fish and Wildlife Service (USFWS). Geographic Information Systems (GIS), Global Positioning Systems (GPS), and remote sensing are the primary elements which fall under the geospatial data and services umbrella.

Geospatial services provide the technology to create, analyze, maintain, and distribute geospatial data and information. GIS, GPS and remote sensing play a vital role in all of the Service's long-term goals and in analyzing and quantifying the USFWS Operational Plan Measures.

Nationally coordinated support for geospatial services, along with regional support and infrastructure, promotes cost savings and enables improved business practices. GIS, GPS and remote sensing can enable improved visualization, analysis, interoperability, modeling, and decision support. The benefits include increased accuracy, increased productivity, and more efficient information management and application support.

This site was created to enable the USFWS to be effective in managing geospatial data resources and technology to successfully deliver geospatial services in support of the Service's mission.

### GIS Resources:



[USFWS National Data](#)



[USFWS Applications](#)



[geo.data.gov](http://geo.data.gov)





U.S. Fish & Wildlife Service

# FWS Geospatial Strategy

## The SharePoint Site at a Glance:

<https://fishnet.fws.doi.net/projects/GIS>

### ▶ General Info and Resources

Email List Serves, Resources (Maps, Graphics, Logos, Best Practices), Help, Disclaimers

### ▶ Contracts, Policies and Standards

USFWS GIS Steering Committee, FWS Data Standards, Contracts and Agreements, Position Descriptions

### ▶ Software and Applications

Installation Guides and Licensing for all Provisioned Software

### ▶ Data Portals

Information on sharing data, including data.gov, geo.data.gov, and SERVCAT

### ▶ GPS

Information on GPS within the USFWS

### ▶ Remote Sensing

Information on Remote Sensing within the USFWS

### ▶ Education and Training

Courses Available from ESRI, NCTC, and other Vendors to strengthen your knowledge in GIS and Geospatial Applications

### ▶ Conferences and Events

Information on Conferences and Events, both Current and Archives of Past Events

### ▶ Groups and Committees

Links to SharePoint Sites for Various Geospatial Groups, Committees, and Regions

### ▶ Multimedia Gallery

Map Gallery and Video Gallery

### ▶ Latest News

Latest News in the USFWS Geospatial Program

### ▶ Plus Much More!

For any questions pertaining to the National Geospatial Program or SharePoint, please contact Matt Faruolo at (303)-275-2363





**U.S. Fish & Wildlife Service**

## **FWS GIS Steering Committee**

- Over 100 Action Items for 2014
  - Communication, Deputy Director Briefing, Open Forums & Training
  - FWS GIS Steering Committee Meeting Notes & emails
  - Newsletter
  - SharePoint & Internet Sites





U.S. Fish & Wildlife Service

# FWS Geospatial Sharepoint Site

The screenshot shows the USFWS Geospatial Services SharePoint site. The top navigation bar includes "Site Actions", "Browse", and "Page". The main header features the USFWS logo, "USFWS Geospatial Services", and "GIS". On the right, there are "I Like It" and "Tags & Notes" icons, and a search bar labeled "Search this site...".

The left sidebar contains a navigation menu with the following items: "Geospatial Home Page", "General Info and Resources", "Contracts, Policy and Standards", "Software and Applications", "Data Portals", "GPS", "Remote Sensing", "Education and Training", "Conferences and Events", "Groups and Committees", "Multimedia Gallery", "Latest News!", "Regional Pages", "Region 1 GIS", and "Region 3 GIS".

The main content area has a "Home - GIS" breadcrumb. Below it is a large banner with a duck in flight and the text: "Welcome to the USFWS Geospatial Portal" and "Your source for everything geospatial in USFWS". To the right of the duck is a small USFWS logo and a list of services: "GIS / GPS / Remote Sensing / Metadata / Training / Events / Software / Policy / Licensing / Much More".

Below the banner is a grid of 12 orange buttons arranged in three rows and four columns:

- Row 1: "General Info and Resources", "Policy and Standards", "Software and Applications", "Data Portals (uploading/serving data)"
- Row 2: "GPS (Global Positioning System)", "Remote Sensing", "Education and Training", "Conferences and Events"
- Row 3: "Groups and Committees", "Multimedia Gallery", "Geospatial Library", "Latest News!"





# Install Scripts

## Automation saves money!

- Install Scripts & Guides
- System Center Configuration Manager (SCCM) and AppsToGo
- Region 3 SCCM and GIS Group – major achievements in time saving through installation scripts – currently working on 10.2.1 script

### ArcGIS Desktop 10 Installation

**Before you install any product, you must first contact your **Regional GIS Coordinator** so that they may furnish you with a provisioning file to authorize your software. [Please click here to find out who your point-of-contact is.](#)**

**ArcGIS Desktop 10 Installation Guide** - This is the "standard" method to install ArcGIS Desktop 10 on your machine.

**ArcGIS Desktop 10 Software Download Instructions** - This is a list (including links) of all the software you will need to install ArcGIS Desktop 10 on your computer.

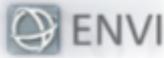
**ArcGIS Desktop 10 Script Installation Guide** - This script saves time during the install process, and makes the installation of ArcGIS Desktop 10 much easier and less time-consuming. Please contact your **GIS Representative** to obtain a copy of the Script on DVD.



## U.S. Fish & Wildlife Service

# National Geospatial Software \$2M cost avoidance

The USFWS has national software licensing with numerous companies that produce and distribute GIS and geospatial-related software packages and extensions. FWS GIS users have access to all of the following programs and extensions. *Please click on the software icon to be taken to its information page:*



U.S. Fish & Wildlife Service

## FWS Task Groups

### Remote Sensing



- Improve distribution & access to remote sensing products
- Coordinate FWS component of President's Aeronautics & Space Report
- Contribute to National Remote Sensing Groups
- Sharepoint Site for Remote Sensing & Task Group Site



U.S. Fish & Wildlife Service

## FWS Task Groups

### Unmanned Aircraft Systems



- Improve effectiveness & cost efficiency of use of unmanned aircraft systems
- Recommendations to DOI UAS groups and others
- Sharepoint Site for UAS (under development) & Task Group Site



U.S. Fish & Wildlife Service

## FWS Task Groups



- Promote communication of mobile technologies & GPS
- National GPS & Mobile Technology Committees
- Best practices GPS equipment list
- Sharepoint Site for GPS & Task Group Site



U.S. Fish & Wildlife Service

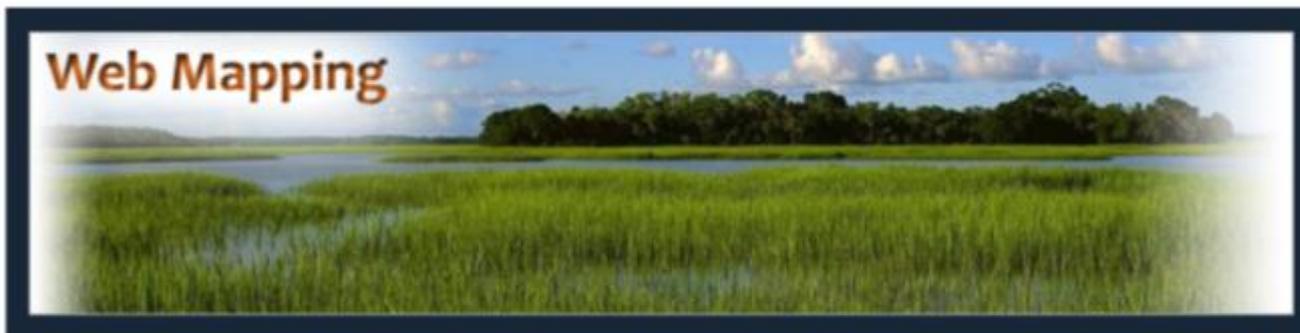
# Web Mapping Task Group

## Serving data & mappers

- Can you vs. should you?
- Document, document, document
- Security & Application Development Lifecycle

## Data Lifecycle

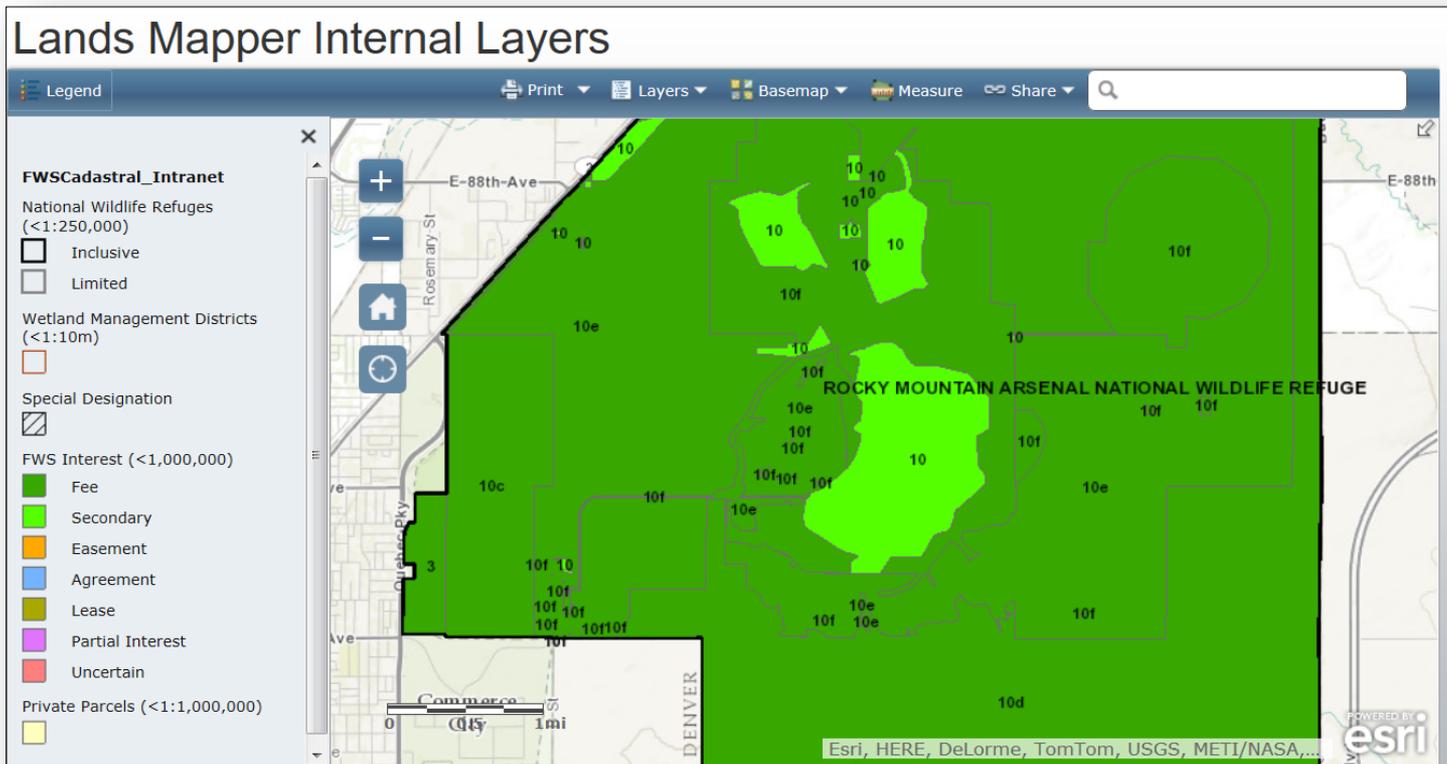
- Define, inventory/evaluate, obtain, access, maintain, use/evaluate, archive & QA/QC





# Web Mapping Task Group

The sharepoint site was created to assist with the very quickly changing web mapping application technologies. Please consider thinking about **web mapping application creation separately from the data services** that are accessed by the web mapping application as data can be supplied inside a network or permissioned differently from the web mapping application.





# Serving Data – some methods Considered independent of mapper

## Web Mapping Home

### Available Technologies:

ArcGIS Online (AGOL)

Data Basin

ESRI API

Google API

Open Source

Sandbox FWS Internal

ScienceBase/LC Map

System Developers

### Internal (FWS Intranet Only) Data

- FWS System Developers: ECOS & SDT
- Sandbox Denver test server, local or regional servers

### Public and “authorized” data

- ScienceBase & other data service hosting (LCCs)
- FWS System Developers: ECOS & Denver (data services)

### ArcGIS Online

- Test scenario – DOI Working on Authority to Operate
- NO TILING
- 50K credits for 2014
- Generally: public or draft public – ask your boss

DON'T FORGET DATA LIFECYCLE





## U.S. Fish & Wildlife Service

# Web Mapping Applications

- ScienceBase, DataBasin, Open Source, System Developers: ECOS & SDT
- FWS Applications (FWS Websites) – working on FWS mapping application template using the FWS web manual, internet mapping standard and FWS graphics standards (Javascript & Leaflet) for multiple devices
- ArcGIS Online – hosts mapping applications & mappers
  - One map can viewed on multiple devices (browser, mobile, ArcGIS Collector, offline editing)
  - Does not follow current web manual or internet mapping standards
- New FWS Test ArcGIS Portal on FWS intranet – under development





# U.S. Fish & Wildlife Service

## Education and Training



### Classes and Courses:

NCTC Geospatial Courses

NCTC offers a variety of GIS and GPS related classes

ESRI Free Course Catalog

ESRI's "free classes" can be taken by anyone, anytime

ESRI Premium Course Catalog

ESRI Premium classes included with the Enterprise License Agreement with no per course cost



How do I enroll?

Contact your regional "Virtual Campus contact" to sign up for Premium classes

### Videos and Webinars:

FWS GIS YouTube Videos

GIS and geospatial-themed videos on our private\* YouTube

NCTC Geospatial Tutorials

NCTC has a number of tutorials available to you online. Check

NCTC Webinar Center

NCTC's Webinar Resource Center has information on both





U.S. Fish & Wildlife Service

## FWS Geospatial Strategy

### Coordination and Communication – the Key to Success!

We need **your** help – please get involved!

- Task groups
- Field representative
- Newsletter
- Workshops & Training
- Feedback





U.S. Fish & Wildlife Service

## FWS Geospatial Strategy

# Questions?





**U.S. Fish & Wildlife Service**

# **FWS Data Management in FWS**

**Chris Lett**

National GIS Coordinator for the FWS  
Acting National Data Architect for the Service

**Andrey Andreyev**

Lead FWS Systems Development Team  
Acting Service Enterprise Architect

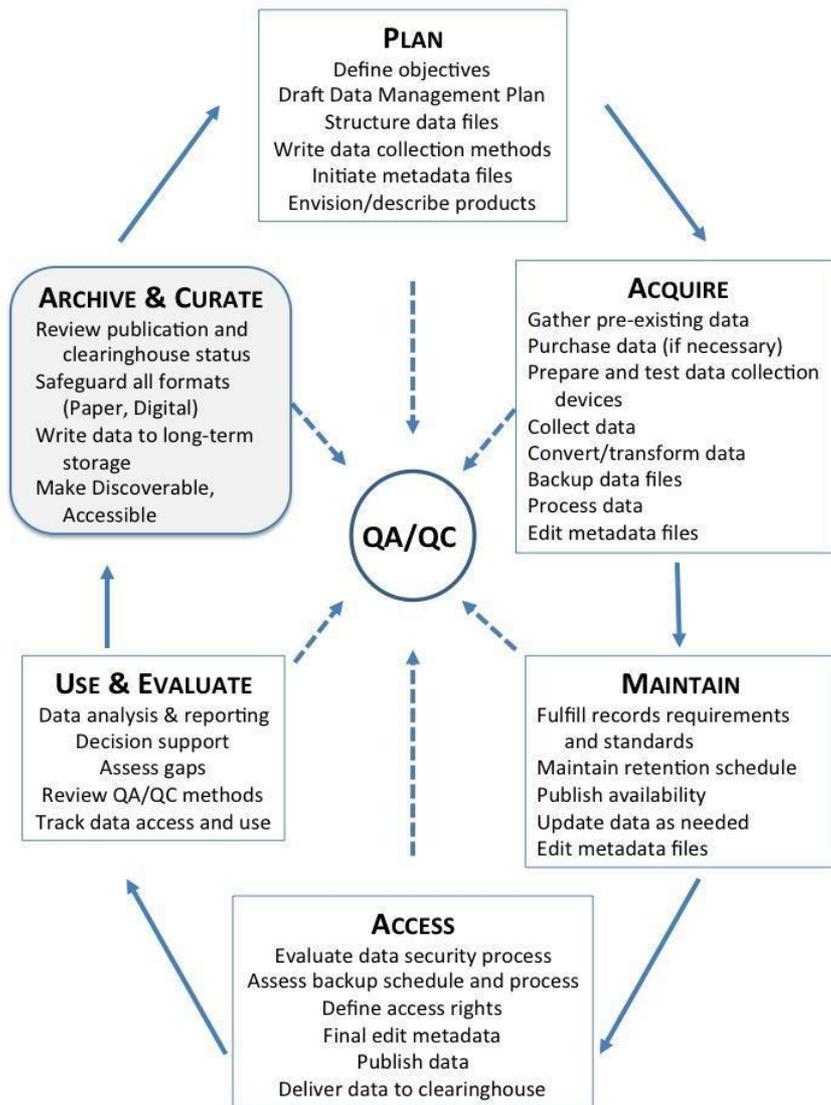
FWS HQ Information Resources and Technology Management  
Branch of Communication Technology

- History
- Federal Policy & Groups
- FWS Policy & Groups





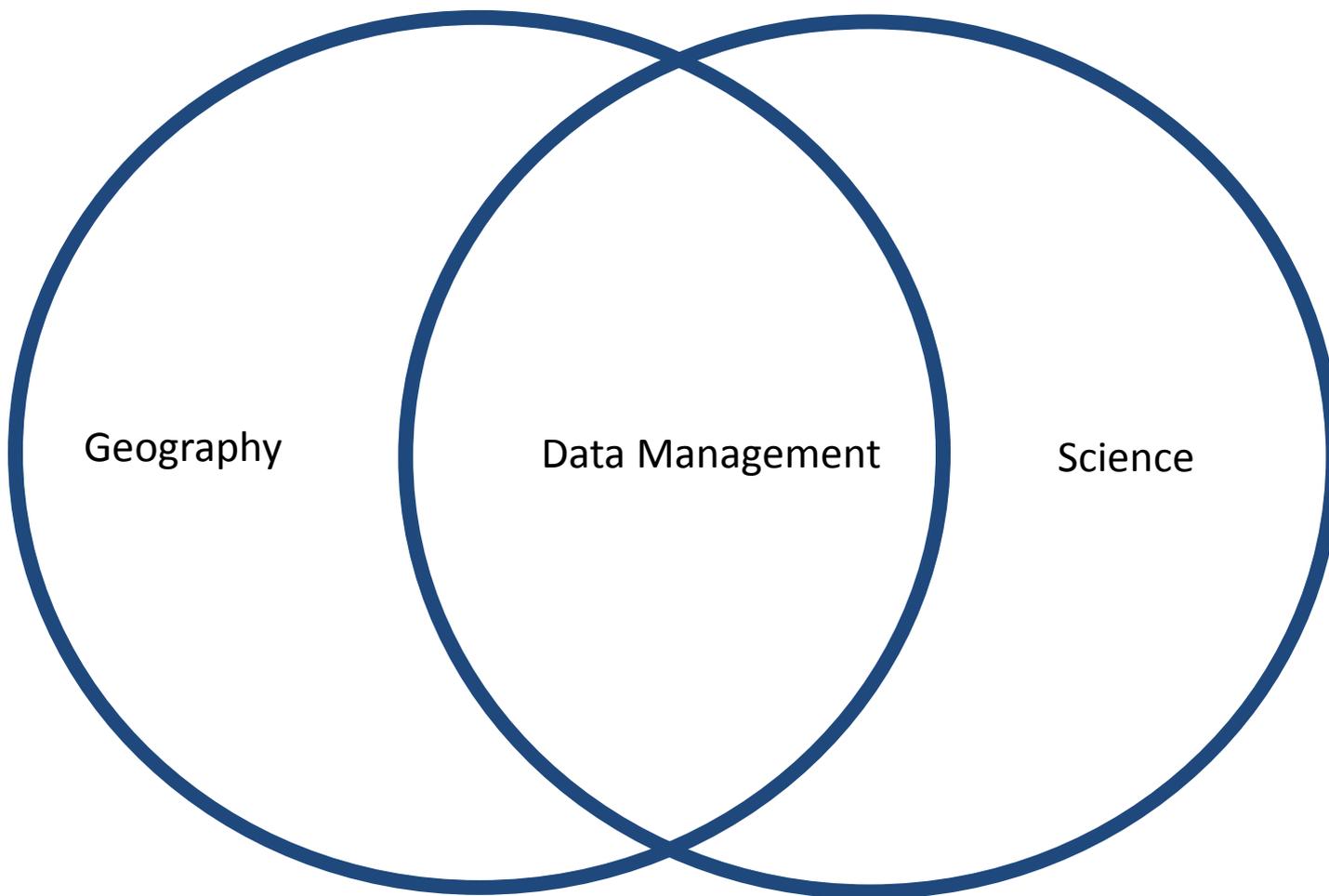
# Data Management Lifecycle





U.S. Fish & Wildlife Service

# Data Management Lifecycle





U.S. Fish & Wildlife Service

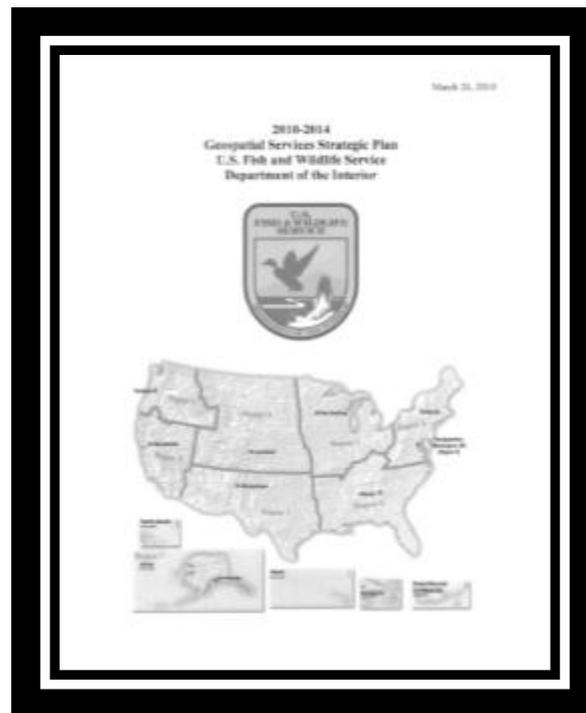
## FWS Geospatial Strategy

### Geospatial Services Strategic Plan

Vision: “Spatially enable business practices and facilitate effective decision making in support of the Service’s mission.”

#### Strategic Goals and Action Items:

- Governance
- Business Processes
- **Data Architecture**
- Application Architecture
- Technology Architecture
- Education Outreach





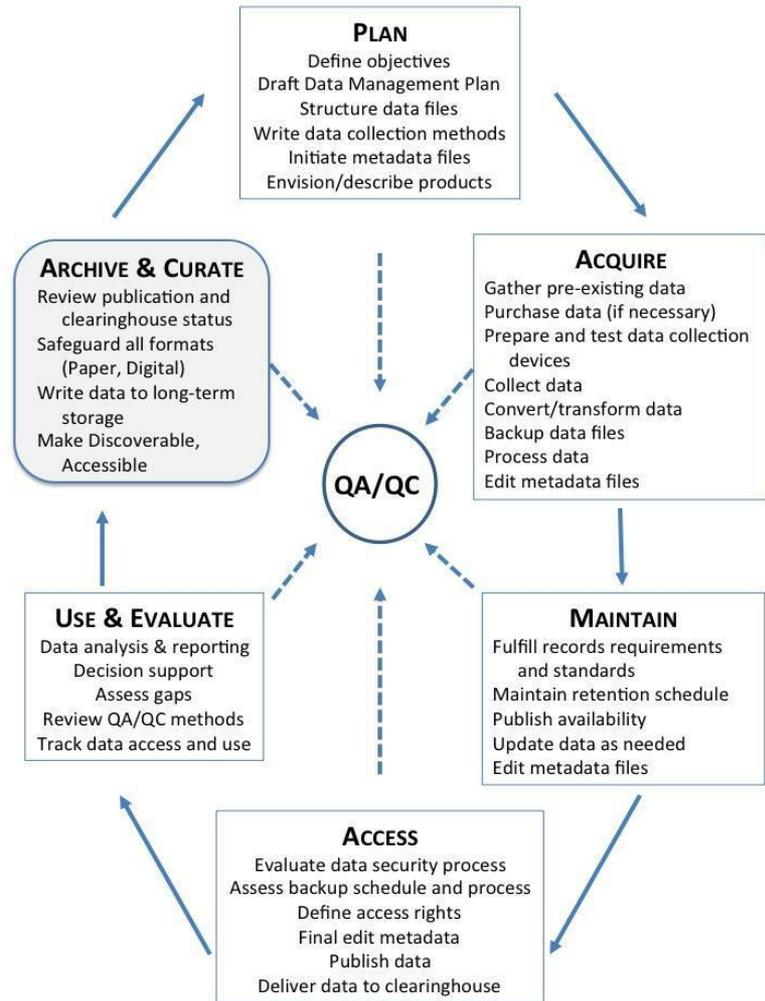
# FWS Groups - DM Subcommittee

## Data Management Subcommittee of the Science Committee

NWRS I&M, Great Northern LCC, R8 Science Apps, R8 NWRS I&M, IRTM, R6 NWRS I&M, Western AK LCC, Cost & Perf Mgt, Mig Birds, ECOS

Working on a Strategy for Scientific Data Management to be presented at Spring Directorate Meeting

- *Promote a culture of accountability*
- *Develop a long-term plan and infrastructure for consistent core data management*
- *Balance and train the workforce*
- *Include data management considerations in budget processes.*
- *Instill a sense of urgency*
- *Call for a Data Mgt position under Sci Adv*





U.S. Fish & Wildlife Service

## FWS Groups - DMAC

### Ad Hoc Data Management Advisory Committee

- Deal with Open Data & Sharing
- One Representative from each Region and Program and additional representatives from Data Lifecycle Elements (FOIA, records management, Emergency Response, etc).
- Specific task – FWS Policy related to DOI Data Management Policy
- Specific task – how to share

#### ACCESS

Evaluate data security process  
Assess backup schedule and process  
Define access rights  
Final edit metadata  
Publish data  
Deliver data to clearinghouse

5. Add additional datasets to DOI Enterprise Data Inventory



U.S. Fish & Wildlife Service

## Policies & Compliance

### Department of Interior Open Data Plan

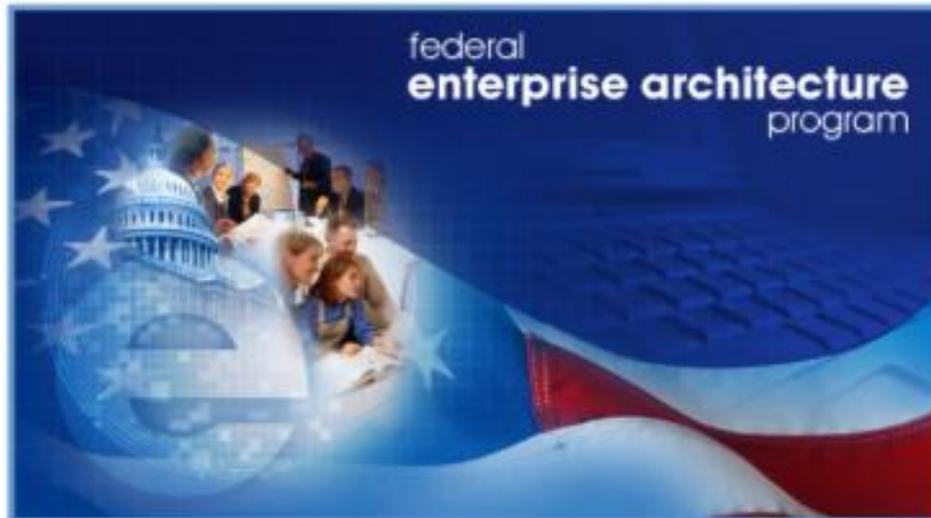
<http://doi.gov/data>

Q3	May 31, 2014	<b><i>Data as an Asset</i></b> <ol style="list-style-type: none"><li>1. Develop a method for discovering unidentified datasets and linking existing datasets to new uses in a methodical way to support business goals</li><li>2. Develop a method to increase the value of prioritized datasets by packaging and/or managing them as services</li><li>3. Provide basic analytics using DOI data for support of internal decision making</li><li>4. Establish regular information sharing sessions on open data and data service delivery topics</li><li>5. Add additional datasets to DOI Enterprise Data Inventory</li></ol>
----	--------------	--



## Federal/DOI History - Compliance

- Federal Enterprise Architecture Program (FEA) & eGov 2002
  - FWS Enterprise Architect – Andrey Andreyev acting
  - FWS Data Architecture – Chris Lett acting
    - Worked on Data Reference Model (DRM) 2005: provided a standard means by which data may be described, categorized & shared.





## Federal/DOI History

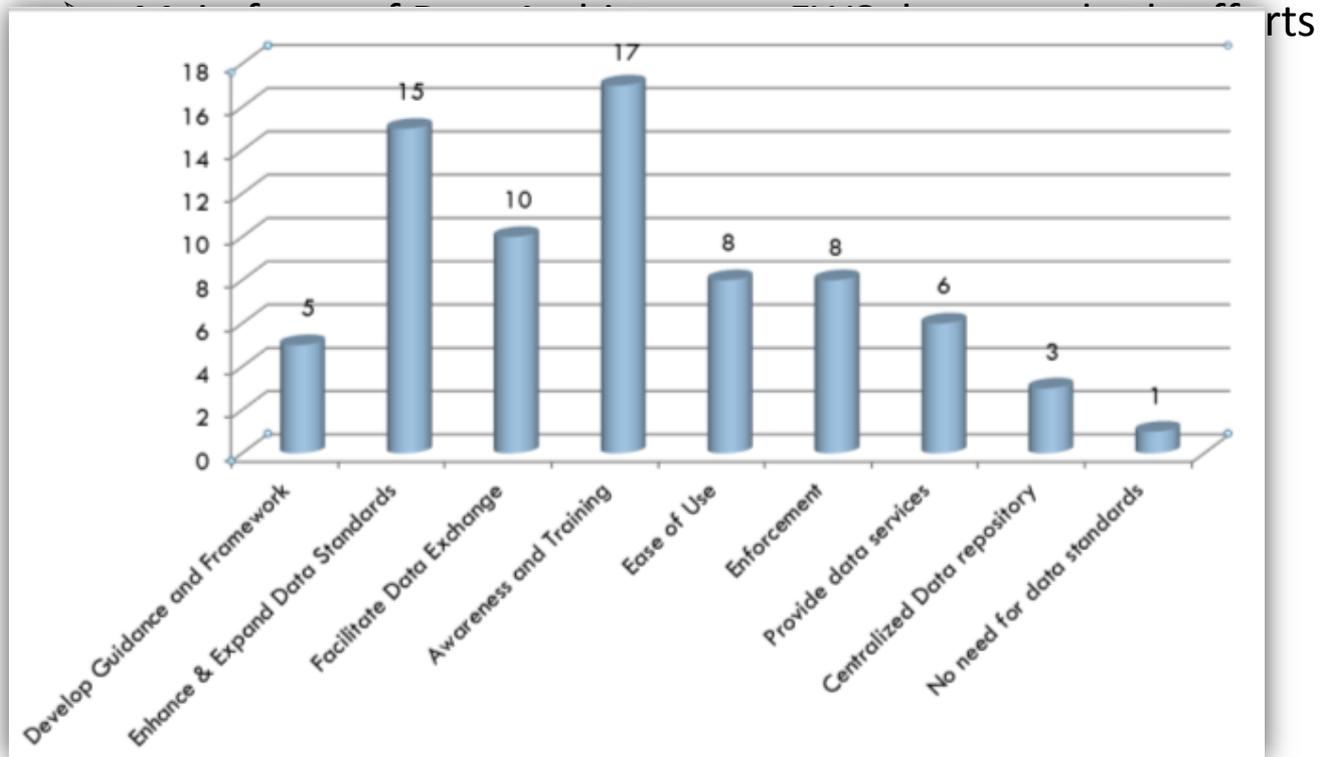
- Department of Interior Enterprise Architecture Reference Model (DEAR) – now retired
  - Described systems & identified Data Reference Model
- Electronic Capital Planning & Investment Control System (eCPIC)
  - Lists systems
  - Referenced Data Reference Model
- DEAR & eCPIC reference systems – not data

eCPIC



## FWS History

- FWS Data Standards and Policy Assessment Survey 2010
  - Sent to data stewards, data users, data producers & Information Technology professionals
    - IT tech list, gis list serv, DEAR & data steward group
  - Main focus of Enterprise Architect – FWS DEAR





U.S. Fish & Wildlife Service

## Policies & Compliance

ACCESS



### ➤ Why?

- Since 2011 Bureau Organizational Assessments required data shared through data.gov (**one dataset a quarter**)
- eGov scorecard – FWS CIO EPAP

### ➤ How?

- Kenny Elsner work as Point of Contacts
- One dataset a quarter
- Several years of “upgrades” & “fixes”



U.S. Fish & Wildlife Service

## Policies & Compliance

# M-13-13 – Office of President Open Data Policy – Managing Information as an Asset



EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503

THE DIRECTOR

May 9, 2013

M-13-13

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM:

Sylvia M. Burwell  
Director

Steven VanRoekel  
Federal Chief Information Officer

Todd Park  
U.S. Chief Technology Officer

Dominic J. Mancini  
Acting Administrator, Office of Information and Regulatory Affairs

SUBJECT: Open Data Policy—Managing Information as an Asset



U.S. Fish & Wildlife Service

## Policies & Compliance

### Department of Interior Open Data Plan

<http://doi.gov/data>

Q3	May 31, 2014	<b><i>Data as an Asset</i></b> <ol style="list-style-type: none"><li>1. Develop a method for discovering unidentified datasets and linking existing datasets to new uses in a methodical way to support business goals</li><li>2. Develop a method to increase the value of prioritized datasets by packaging and/or managing them as services</li><li>3. Provide basic analytics using DOI data for support of internal decision making</li><li>4. Establish regular information sharing sessions on open data and data service delivery topics</li><li>5. Add additional datasets to DOI Enterprise Data Inventory</li></ol>
----	--------------	--



U.S. Fish & Wildlife Service

## Policies & Compliance

### Department of Interior Open Data Plan

<http://doi.gov/data>

Q2	Feb. 28, 2014	<p><b>Structure</b></p> <ol style="list-style-type: none"><li>1. Publish DOI Data Resource Management Departmental Manual</li><li>2. Publish DOI Open Data Policy and Implementation Guide</li><li>3. Publish DOI Data Release Process</li><li>4. Publish DOI Metadata Policy and Implementation Guide</li><li>5. Develop internal and external communication plan to share information and collect feedback</li><li>6. Develop and deliver data management training for DOI Data Service Team</li><li>7. Add additional datasets to DOI Enterprise Data Inventory</li></ol>
----	---------------	--



U.S. Fish & Wildlife Service

## FWS Groups - DMAC

### Proposed Data Management Advisory Committee

- Ad Hoc Committee proposed to address the current data management policies & deadlines -
- One Representative from each Region and Program and additional representatives from Data Lifecycle Elements (FOIA, records management, Emergency Response, etc).
- <https://drive.google.com/a/fws.gov/?tab=mo#folders/0B3lfgTqE1t6XRTFyQWlITzgyQVU>





U.S. Fish & Wildlife Service

## Policies & Compliance

### DOI Open Data Policy Memo:

- Create DOI Data Services Team (Andrey/Chris)
- **Create an inventory of datasets with core metadata** Publish publicly-available items
- Create process to engage with customers & end users of data to prioritize release
- Clarify agency roles and responsibilities for promoting efficient & effective data release & management practices

### DOI Department Manual on Data Management

:

The DOI Data Services Team will also work on updating the Dept Manual, creating metrics, metadata requirements, and more.



## U.S. Fish & Wildlife Service

# FWS Representatives

Andrey Andreyev  
Lead FWS Systems Development Team  
Acting FWS Enterprise Architect  
DOI Data Services Team  
IRTM, Lakewood, CO

Chris Lett  
National GIS Coordinator FWS  
Acting FWS Data Architect  
DOI Data Services Team  
DOI Geospatial Advisory Committee  
Geospatial and Data Services Team  
IRTM, Lakewood, CO

Todd Sutherland  
National Data Manager  
National Wildlife Refuge System  
Inventory & Monitoring  
National Resources Program Center  
Ft Collins, CO

Kenny Elsner  
Cartographer  
POC for data.gov  
DOI Remote Sensing Working Group  
DOI Position Navigation Group  
Geospatial and Data Services Team  
IRTM, Lakewood, CO

**Data Management in your Job Title?**





U.S. Fish & Wildlife Service

## Ad Hoc Data Management Advisory Committee

- White House Open Data Policy
- One Representative from each Region and Program and additional representatives from Data Lifecycle Elements (FOIA, records management, Emergency Response, etc).





U.S. Fish & Wildlife Service

## FWS Groups - DMAC

### Ad Hoc Data Management Advisory Committee

- Deal with Open Data & Sharing
- One Representative from each Region and Program and additional representatives from Data Lifecycle Elements (FOIA, records management, Emergency Response, etc).

#### ACCESS

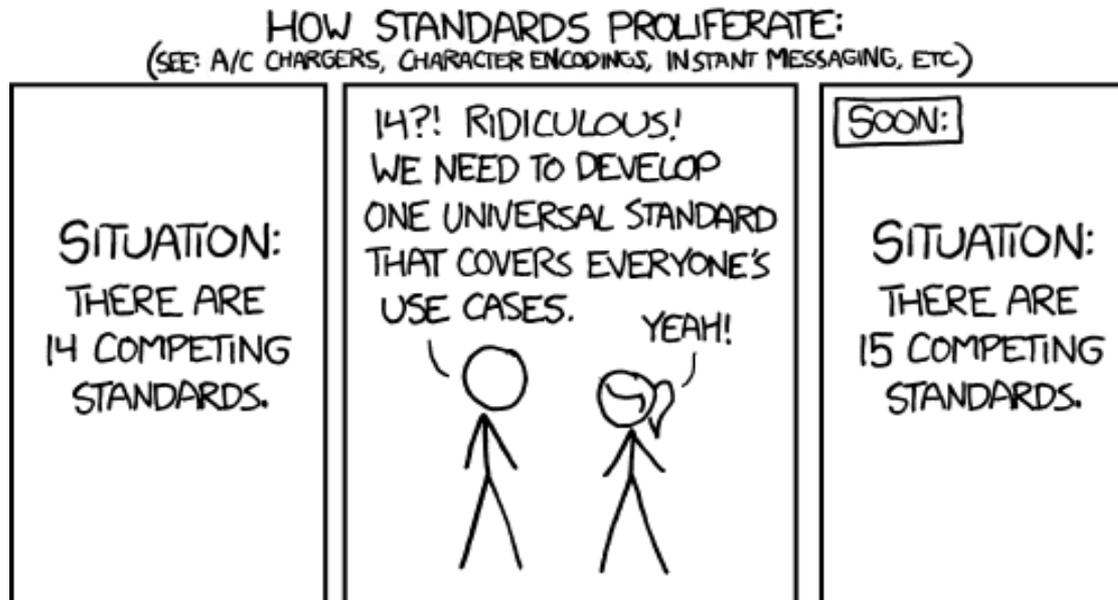
Evaluate data security process  
Assess backup schedule and process  
Define access rights  
Final edit metadata  
Publish data  
Deliver data to clearinghouse





## FWS History

- Federal Enterprise Architecture Program (FEA)
  - Acting Enterprise Architect – Andrey Andreyev
- Data Architecture
  - Acting Data Architect – Chris Lett
- DOI Data Architect Committee (DAC) – retired/disbanded ~2009
- Previous Focus on Data Standards – no enforcement
- Call for Senior Level Committee in ~2009





## U.S. Fish & Wildlife Service

# FWS Data Management Sharepoint

DOI Sharepoint Site - open to all DOI and partners can join too (under development)

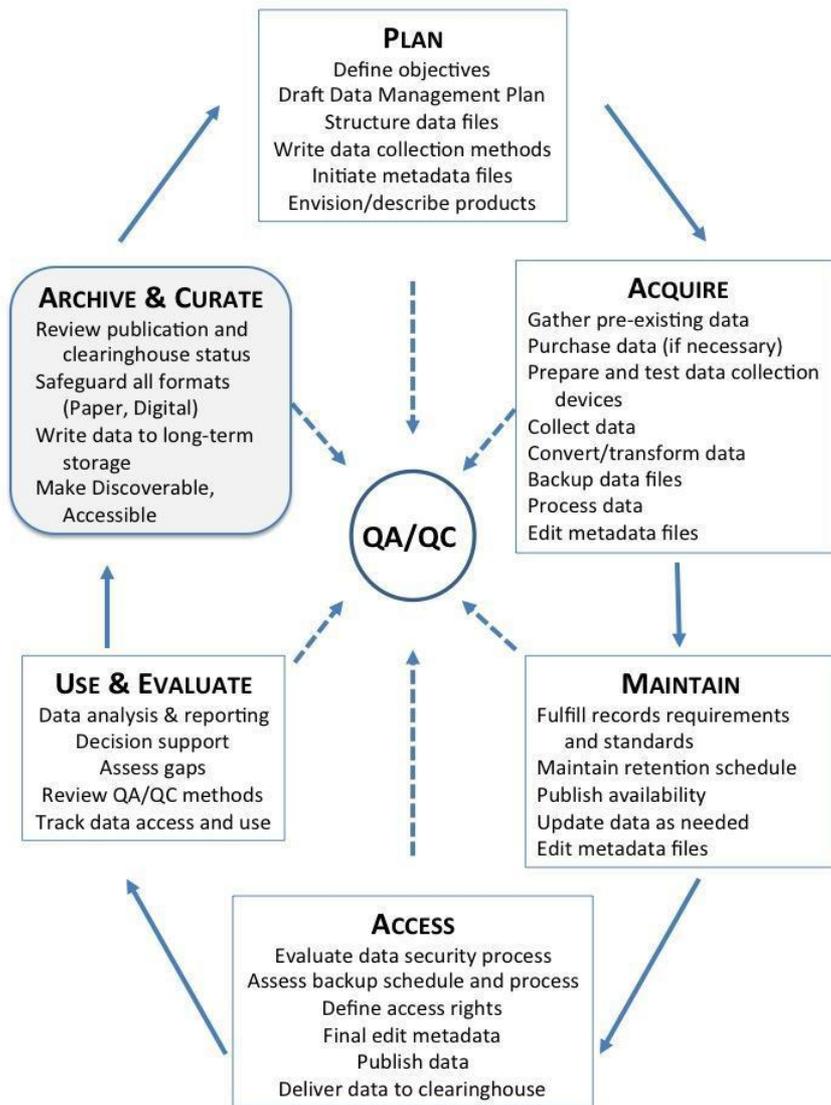
<https://connect.doi.gov/fws/Portal/fwsdm>

Resources: Training Documents, Recordings, Policies - completed  
fws-data-email-listserv

The screenshot shows a web browser window displaying the FWS Data Management SharePoint site. The browser address bar shows the URL <https://connect.doi.gov/fws/Portal/fwsdm/SitePages/Home.aspx>. The site header includes "FWS Data Management" and "Sub-Committee of the Science Committee". A navigation menu on the left lists various sections: HOME, POLICY, RESOURCES, DATA LIFECYCLE, CONTACTS, ABOUT FWS DATA MANAGEMENT, Libraries, Site Pages, Shared Documents, Sensitive Documents, Lists, Calendar, Tasks, Policy Guidelines, Definitions List, FWS Data Management Contacts, Data Management Resources, Discussions, Team Discussion, Recycle Bin, and All Site Content. The main content area features a banner with a wolf silhouette and the text "FWS Data Management Sub-Committee of the Science Committee". Below the banner is a welcome message: "Welcome to the FWS Data Management SharePoint Site!". Four buttons are displayed in a row: Policy, Resources, Data Lifecycle, and Contacts. At the bottom, there is a call to action: "Subscribe to the fws-data email listserv! Stay informed of all the developments for FWS Data Management". The footer indicates "DM Subcommittee (permissioned access)".



# Data Lifecycle





## U.S. Fish & Wildlife Service

# Lifecycle

- Open Data Directive
- Service Catalog (NWRS I&M System owners)
- JSON script to publish to DOI CKAN
- 11,000 public records by Nov 30
- FWS Service Catalog

### ACCESS

- Evaluate data security process
- Assess backup schedule and process
- Define access rights
- Final edit metadata
- Publish data
- Deliver data to clearinghouse





## Lifecycle

- Records Management & Retention Schedule

<http://www.fws.gov/irm/bpim/recman.html>

- DOI Electric Records & Document Management System (ERDMS) – in progress

- Freedom of Information Act

<http://www.fws.gov/irm/bpim/foia.html>

- GIS Metadata Tools

- ServCat – xml for geospatial or Dublin core forms for non-geospatial

### MAINTAIN

Fulfill records requirements and standards  
Maintain retention schedule  
Publish availability  
Update data as needed  
Edit metadata files

Copyright 2005 by Randy Glasbergen.  
www.glasbergen.com



“We back up our data on sticky notes because sticky notes never crash.”



# Lifecycle

- Data Delivery and Standards & Specifications Template
- Improve Data Deliverables Associated with Contracts & Agreements

## ACQUIRE

- Gather pre-existing data
- Purchase data (if necessary)
- Prepare and test data collection devices
- Collect data
- Convert/transform data
- Backup data files
- Process data
- Edit metadata files

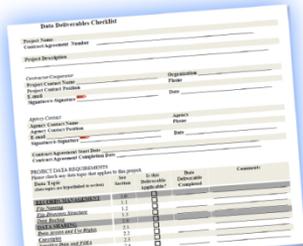
U.S. Fish & Wildlife Service

## Data Delivery Standards & Specifications Template

---

*Improve Data Deliverables Associated with Contracts and Agreements:*

The Data Delivery Standards & Specifications Template is a flexible tool intended to provide government project managers with a selection of best practices, standards, and documentation focused on improving the quality of data and documentation delivered through contracts, agreements, and other collaborative activities.

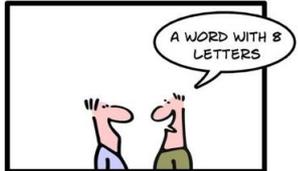
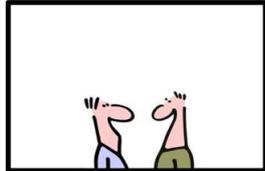


**Who should use the template?**  
Government project managers and specialists in cooperation with contracts and agreement personnel. Project managers cover a wide range of disciplines including: biology, ecology, hydrology, geography, planning, and data management.

**Why use the template?**  
Project managers and GIS/Data managers should use the template to evaluate the range of potential data deliverables relevant to their individual project(s) and complement a Statement Of Work, or help define the requirements for a data management plan. In return, contractors and cooperators will have a clearer understanding of project expectations and their responsibilities. The template can be used to develop either pre-contract Requests For Proposals (RFP) or used after an



SIMPLY EXPLAINED: METADATA





# Lifecycle

- Data Standards process (adopted/created)

- National Wetlands Inventory
- Critical Habitat

<http://www.fws.gov/stand/>

- Draft simple Data Management Plan

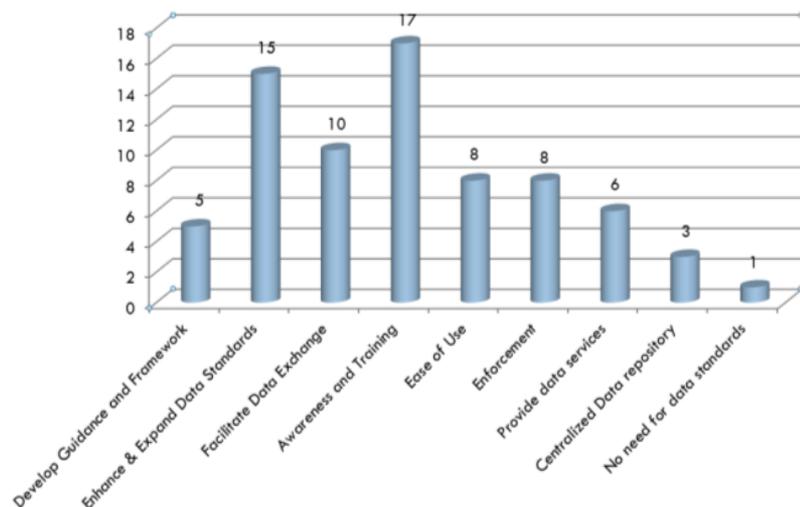
- Based on USGS Climate Science Center & LCC Data Management Team efforts

- <https://nccwsc.usgs.gov/content/data-policies-and-guidance>

- “Data should be managed separately from systems and applications” TC

## PLAN

Define objectives  
Draft Data Management Plan  
Structure data files  
Write data collection methods  
Initiate metadata files  
Envision/describe products



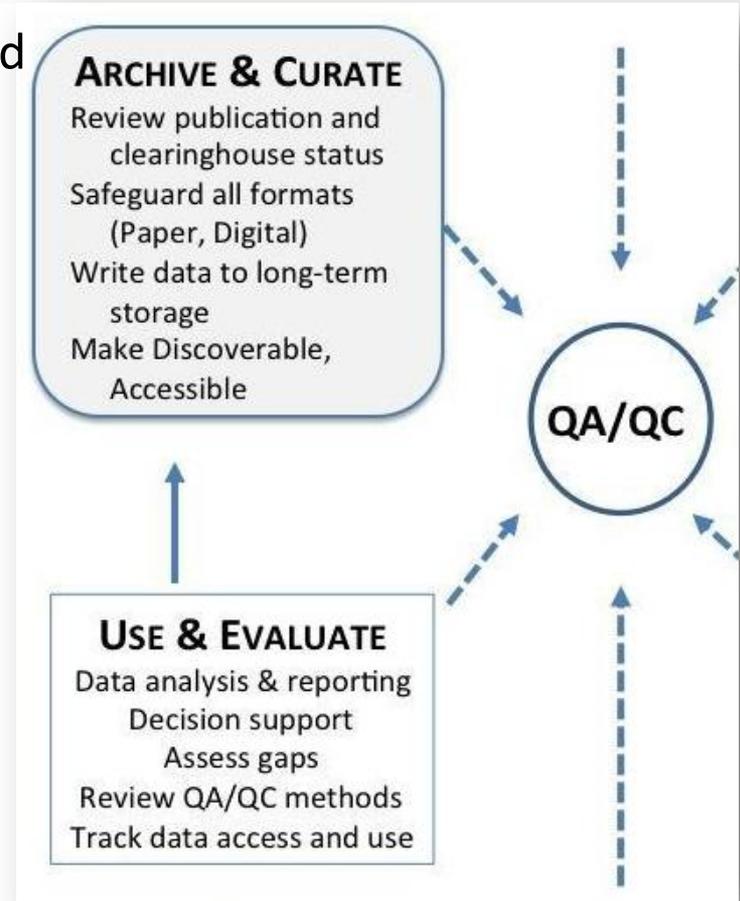
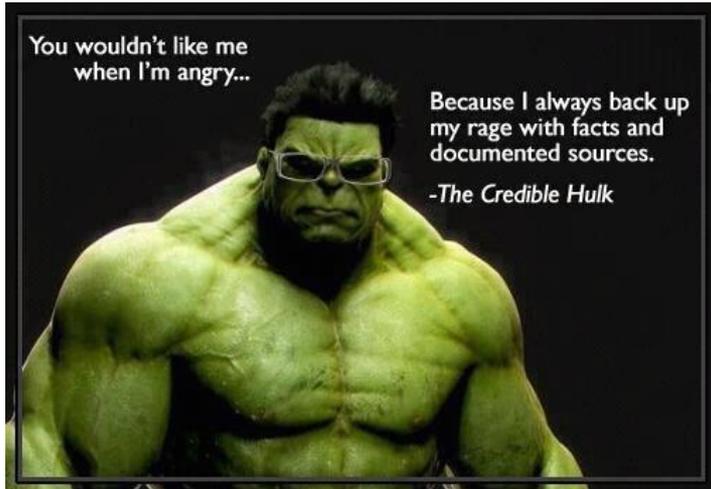


# Lifecycle

- FWS Information Quality Guidelines and Peer Review (2012)

<http://www.fws.gov/informationquality/>

- NWRS I&M Survey Protocols
- Systems/Applications for Reporting





## Biggest Challenges

1

- Culture

2

- Organizational Management

3

- Information Management Infrastructure

- Training
- Policy
- Enforcement
- People

