

National Water Quality Monitoring Council: Are Statewide or Regional Databases Really Possible?

*Colorado Water Quality Monitoring
Council*

& Our Keystone Project

Data Sharing Network (DSN)

Presenting for the Colorado Water Quality Monitoring Council:

Jacob Bornstein: Colorado Watershed Network

Jacob@coloradowatershed.org

but...

Over 70 people and 30 organizations involved

Outline

- History/Philosophy
- CDSN Components/Overview
- Discussion Topics/ CDSN Needs

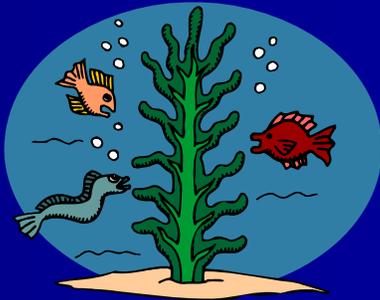
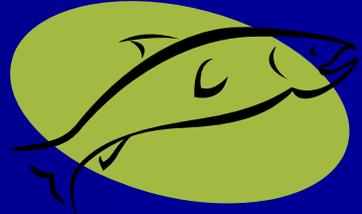
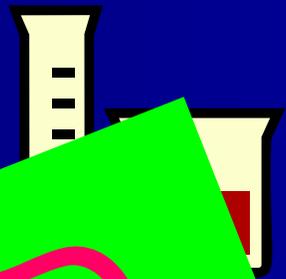


**Why is
it so
painful?**

First Effort: Standardize Methods



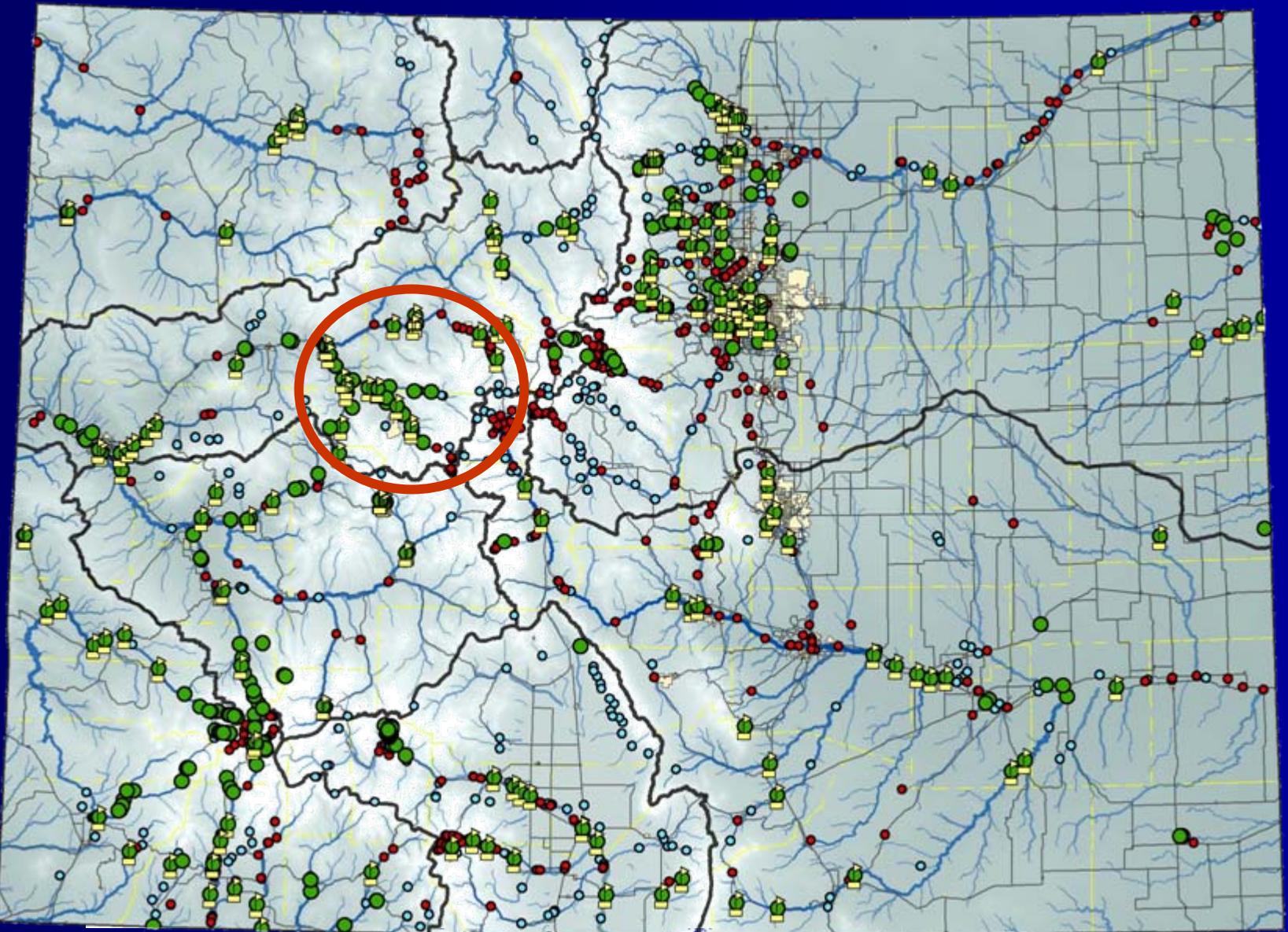
FAILED



Potential Data Sources in 1 Basin:

- River Watch
- Roaring Fork Conservancy
- Garfield County
- U.S. Geological Survey
- City of Rifle
- Town of Basalt
- Roaring Fork Stream Health Initiative
- Colorado River Water Conservation District
- Basalt Water Conservancy District
- And more!

River Watch



What is the 3 Headed Monster?

1. Financial Barriers



2. Technical Barriers

3. Lack of Time

Innocent Citizen
that needs
information

And in the midst of all this....

- *4.9 million people w/ high rate of growth*
- *Natural Resource extraction (methane, oilshale, coal)*
- *70% federal land, 6 ecoregions, headwaters*
- *Drought, Fire, Floods*
- *770,000 river miles – water is a property right*
- *Metals and sediment are priority pollutants*
- *Nutrients – but no standards*

Third Effort: Share Meta-Data

W's

WORKED!



NPS Program



EPA STORET

Led to: Data Sharing Network

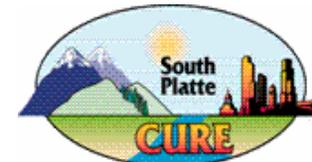
Water Quality Data Here Means:

Chemical, Physical Habitat or Biological Data in rivers, lakes, reservoirs, ground water or wetland water bodies

CDSN Sponsors



City of Englewood



City of Golden

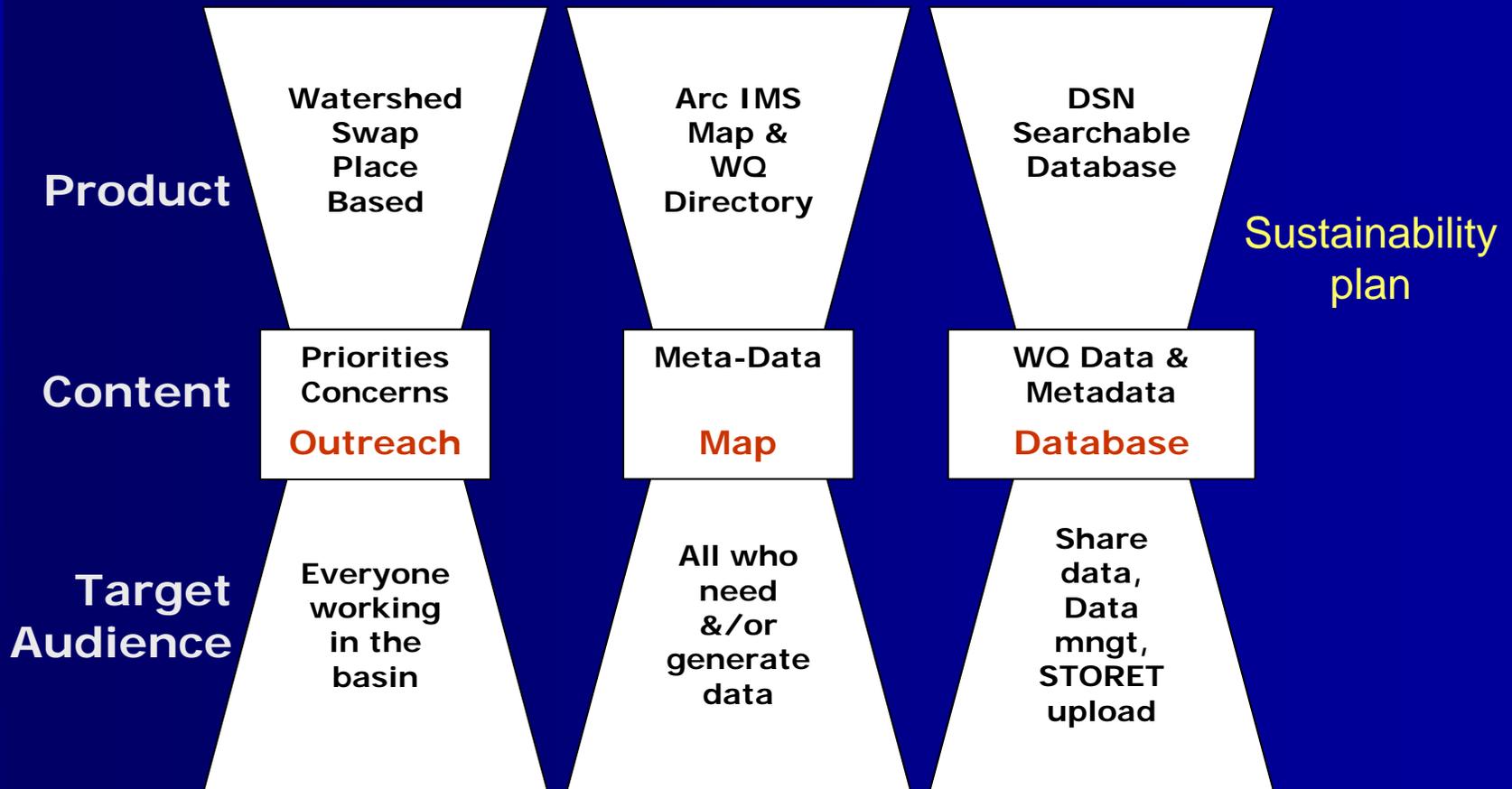


City of Thornton



Colorado Department of Public Health and Environment

CWQMC Data Sharing Network PROJECT COMPONENTS



An aerial photograph of a vast, green forested landscape. In the center, a large, dark blue lake winds through the forest, with a small, tree-covered island in the middle. The forest extends to the horizon under a clear sky.

EVERYTHING

EVERYWHERE

ALL OF THE TIME

Data Sharing Network Addresses Three-Headed Dog

1. Leverage resources
2. Provide platform with training and assistance
3. Provide a primary voice, monitoring directory, and data shop

Big Picture

- Easy & comprehensive data access
- Measuring results of restoration efforts
- Watershed Management Planning
 - Roundtables
 - 208 Planning
 - WQCC rulemaking
 - NPS funding

Data Sharing Network

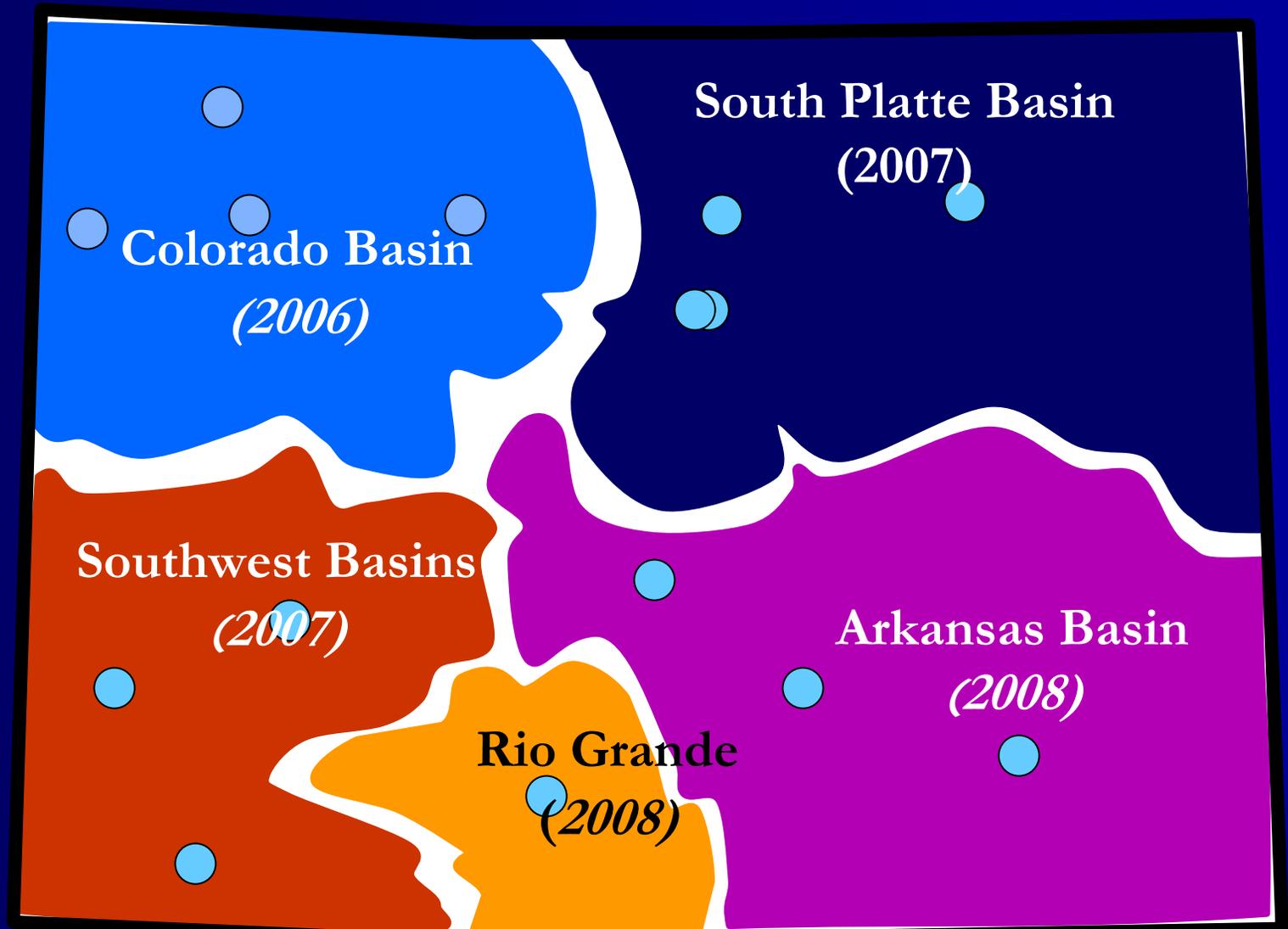
- Sponsored by 319 WQCD
- Conceived by CWQMC
- Implemented by CWN & CWQMC

Outline of CDSN

Components/Overview

- Outreach Effort
- Mapping
- Database

Outreach, Training, Support



Data SWAPS were a success



One Day Event

- Any entity involved in watershed management in the basin of focus
- *Will continue at some frequency and become a mechanism to voice issues, concerns, exchange information, etc.*
-
-
- Followed by CDSIN training

Data SWAP Reports

Colorado Data Sharing Network in Review: The Colorado Basin ~ Yampa, White, N. Platte



Yampa Canyon near Dinosaur National Monument

Yampa, White and North Platte River Basin, Craig

10/31/2006

Watershed SWAP Priorities and Concerns:

- General observation that little water quality data collection is taking place outside of what is required by NPDES Permits
 - Data generators are primarily the larger cities and Forest Service, other entities collecting data primarily gather water quantity information
 - Overall concern for a collective need of data, especially baseline data; there is a lack of available data/ data that is information rich (adequate parameters, location, frequency and duration)
 - Need for E. coli data, especially when streams are on 303d list for violations and have no baseline data at all
 - Concern that a statewide database would encourage others to misuse data at a greater rate, some security of data concerns as well
 - Clarity that a statewide database could help the data gap needs and has built in security measures such as passwords and Final vs. Preliminary data status
 - Integrating internal organizational database mandates, such as Forest Service data, with DSN effort – in a way that does not cause more work
- EVALUATION:**
- Content about right (100%)

Component 2: CDSN MAP



CO Data Sharing Network STORET



Guidance Documentation

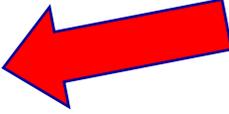
Map

Home

CO Data Sharing Network

Select one of the following to access the corresponding STORET application:

- [WebSIM](#)
- [Regional STORET Warehouse](#)
- [Web Registration](#)
- [Tutorial](#)
- [Map](#)



Colorado Data Sharing Network Viewer - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://codsnarcdev.goldsystems.com/ colorado

W Google Apps CWN Email CWN Google RiverWatch MapQuest

Colorado Data Sharing Network Viewer

ESRI | ESRI Support

Tasks

Query Attributes

Results

Map Contents

- CoR8Main_AXL

Navigation

Overview

The screenshot displays the Colorado Data Sharing Network Viewer web application. The browser window shows the URL 'http://codsnarcdev.goldsystems.com/'. The application interface includes a sidebar with sections for 'Tasks', 'Results', 'Map Contents', 'Navigation', and 'Overview'. The 'Map Contents' section shows a checked item 'CoR8Main_AXL'. The main map area displays a map of Colorado with a cluster of green data points in the eastern part of the state. Three red arrows point to specific UI elements: one to the 'Map Contents' section in the left sidebar, one to the green data points on the map, and one to the 'Overview' map in the bottom-left corner.

Colorado Data Sharing Network Viewer



Tasks

Query Attributes

Results

- [-] CoR8Main_AXL (1025370.2158, 4466622.8596)
 - [-] DSNStation
 - [-] South Platte River at Weld County

R8GIS.DSNStation.ORG_ID
R8GIS.DSNStation.STATION_ID
R8GIS.DSNStation.STATION_NAME
R8GIS.DSNStation.ORG_NAME

Map Contents

- Rivers and Streams ESRI
- Roads (Detailed)
- Basins
- Federal
- Counties



Results

- [-] CoR8Main_AXL (987713.3356, 4211480.1889)
 - [-] DSNStation
 - [-] USFS N. Middle Knobb

CODSNGIS.DSNStation.ORG_ID	COLO319
CODSNGIS.DSNStation.STATION_ID	5
CODSNGIS.DSNStation.STATION_NAME	USFS N. Middle Knobb
CODSNGIS.DSNStation.ORG_NAME	Colorado Watershed Network (CO)
CODSNGIS.DSNStation.PRIMARY_TYPE	River/Stream
CODSNGIS.DSNStation.LATITUDE	37.93
CODSNGIS.DSNStation.LONGITUDE	-105.46
CODSNGIS.DSNStation.HORIZONTAL_DATUM	North American Datum 1983
CODSNGIS.DSNStation.COUNTRY_NAME	UNITED STATES
CODSNGIS.DSNStation.STATE	COLORADO
CODSNGIS.DSNStation.COUNTY	CUSTER
CODSNGIS.DSNStation.URS_LINK	http://codsnarcdev.goldsystems.com/codsnquery.asp?c
CODSNGIS.DSNStation.OBJECTID	51
SHAPE.AREA	0
SHAPE.LEN	0

Minimum Data Element - Chem

- Project
 - Project name, org name, contact, etc.
- Location
 - Lat/long, datum, etc.
- Field Measurements
 - Id, medium, date, time, method, etc.
- Chemical Results
 - Id, medium, date, time, detection, method, etc.

Colorado Data Sharing Network Viewer

ESRI | ESRI Support Center | Help

Tasks

Query Attributes

Results

- DSNStation
 - Fort Lupton
 - R8GIS.DSNStation.ORG_ID MWRD
 - R8GIS.DSNStation.STATION_ID SPR-9
 - R8GIS.DSNStation.STATION_NAME Fort Lupton
 - R8GIS.DSNStation.ORG_NAME Metro Waste
 - R8GIS.DSNStation.PRIMARY_TYPE River/Stream
 - R8GIS.DSNStation.LATITUDE 40.0598333
 - R8GIS.DSNStation.LONGITUDE -104.82672
 - R8GIS.DSNStation.HORIZONTAL_DATUM NAD83

U.S. Environmental Protection Agency

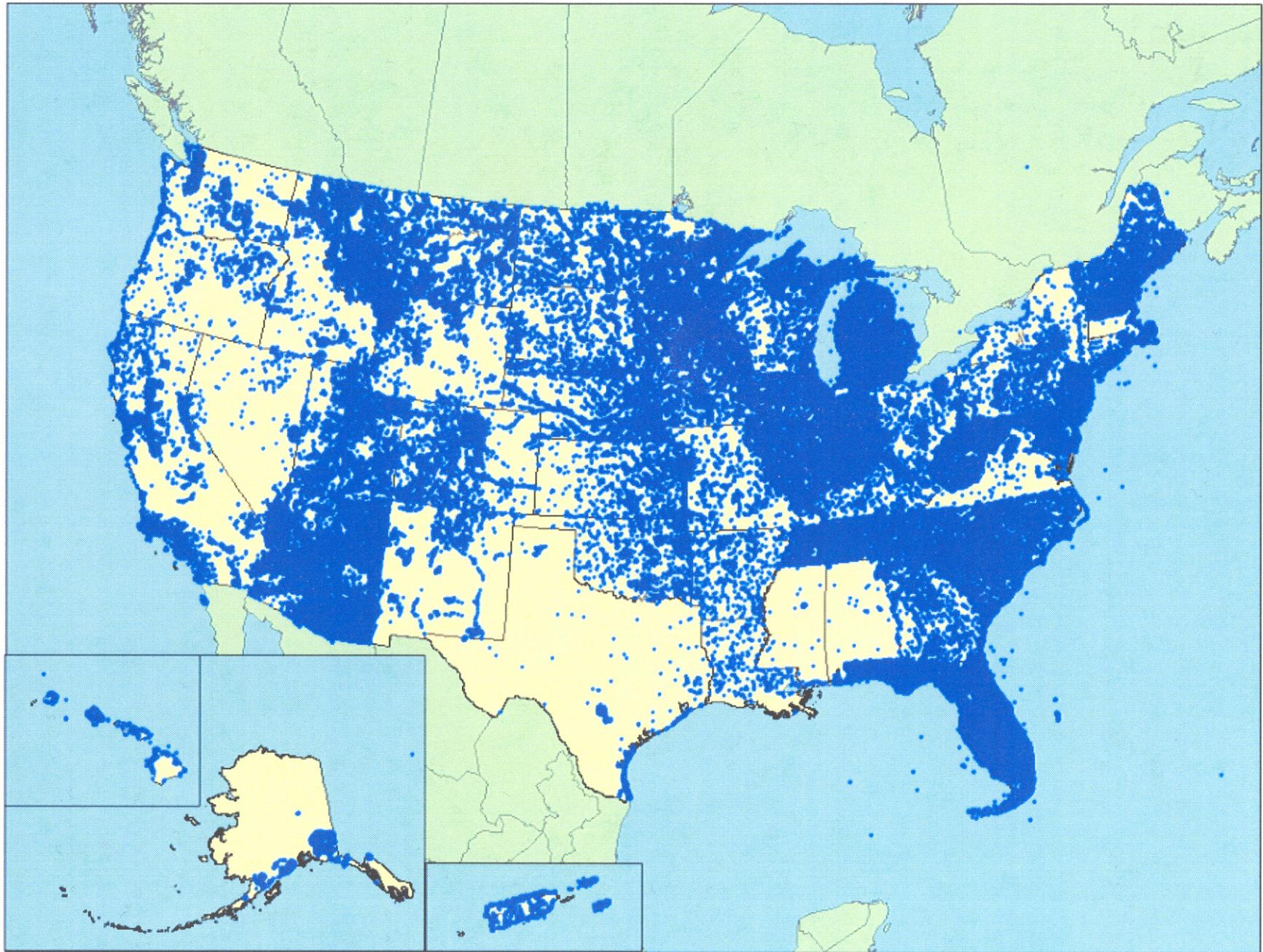
Colorado Data Sharing Network

Location	Sample ID	Analyte	Fraction	Matrix	Result	Reporting Limit	Units	Qualifier	Status	Depth (ft)	Sample Date
SP-RD18	S571375	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			119		mg/l		F	-	16-DEC-2004
SP-RD18	S570071	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			160		mg/l		F	-	01-DEC-2004
SP-RD18	S569011	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			176		mg/l		F	-	17-NOV-2004
SP-RD18	S567781	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			164		mg/l		F	-	03-NOV-2004
SP-RD18	S566568	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			164		mg/l		F	-	20-OCT-2004
SP-RD18	S565344	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			162		mg/l		F	-	06-OCT-2004
SP-RD18	S563266	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			156		mg/l		F	-	15-SEP-2004
SP-RD18	S562040	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			171		mg/l		F	-	01-SEP-2004
SP-RD18	S560790	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			154		mg/l		F	-	18-AUG-2004
SP-RD18	S559442	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			140		mg/l		F	-	04-AUG-2004
SP-RD18	S558667	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			149		mg/l		F	-	28-JUL-2004
SP-RD18	S557154	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)			139		mg/l		F	-	14-JUL-2004

Component 3: Data Base

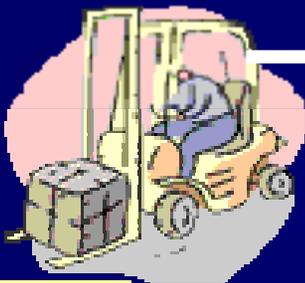
1. Target Audience
2. Data Base
3. WHY STORET?





General Flow

TEMPLATE,
 Excel
 Standardized



WQX



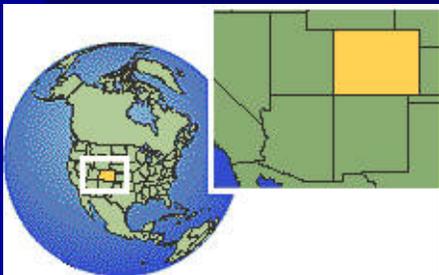
OPTION



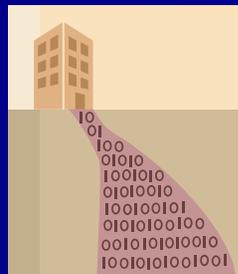
EPA National
 STORET
 Warehouse

STORET Regional
 Warehouse
 DSN Database

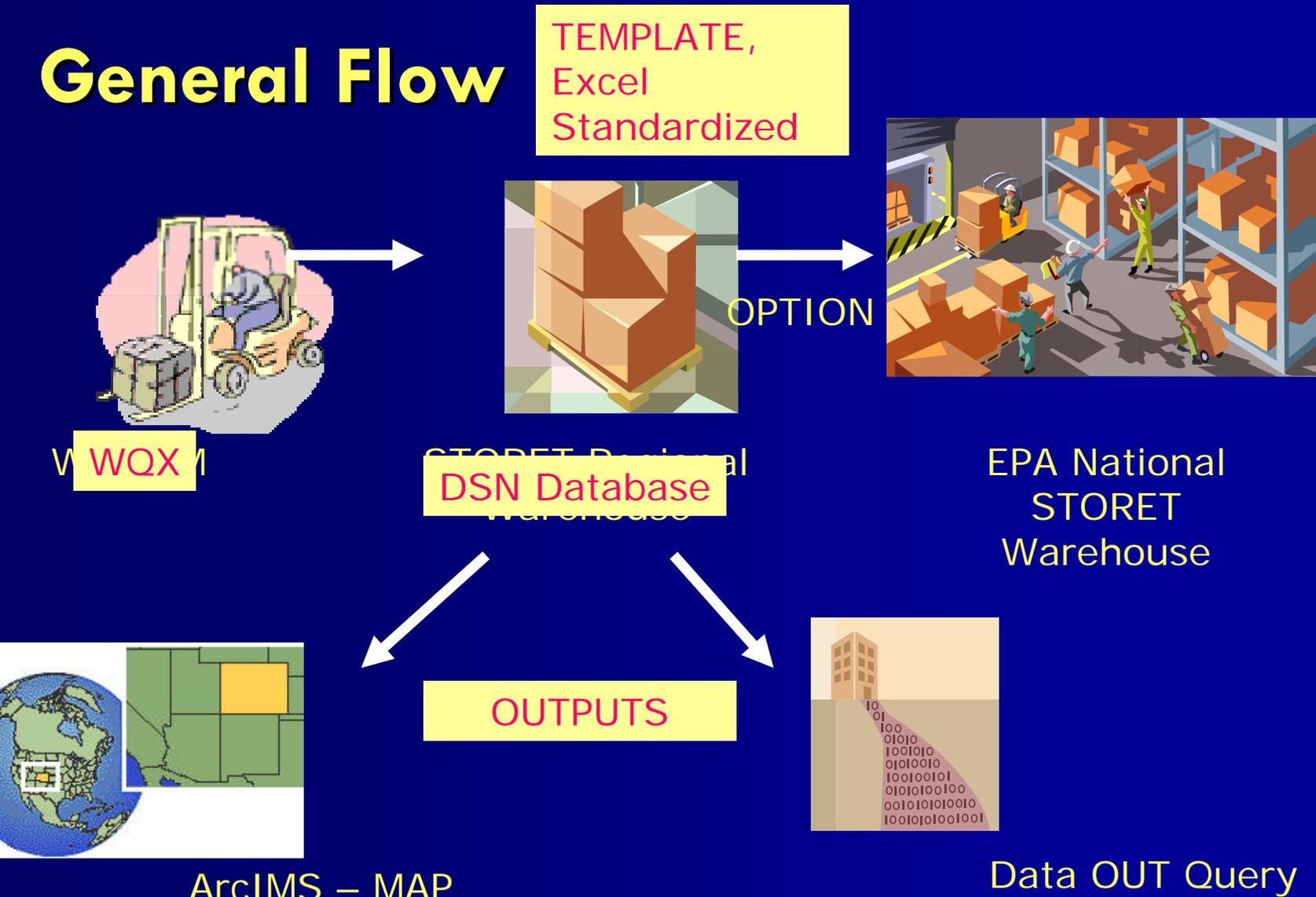
OUTPUTS



ArcIMS – MAP



Data OUT Query



DSN Data Base & Map

- Who puts data on the map or into the database?
 - Data or information generator (with our help)
 - Front end heavy system
 - Once you're set up to use the templates, its easy for database, map too
 - Institutionalize use (and support)
 - Will conduct data calls

Security, Access & Quality

- 3 Security Levels
 - Unique Username and Password
 - “Final” vs. “Preliminary”
 - Option to be excluded from annual National STORET uploads
- Anyone can enter/retrieve data/map info
 - We will track for documentation, sustainability, support
- We make no judgments on your data – anyone can use it, meta will drive that individual decision
- Privately share on map as option

Web SIM — Easy as 1,2,3

[Home](#)

[Projects](#)

[Stations](#)

[Results](#)

[Import Configuration](#)

[Advanced](#)

[Site Help](#)

[Logout](#)



Web SIM - v21 - STORET Interface Module

Fast Track Import Process

Getting Started: This is a DEMO environment to be used as a practice area for Web SIM. You have been assigned the temporary user name **GS04USER**. [Click here to remove all previously imported data and start with a clean environment](#)

Complete the steps listed below for the Fast Track Import Process. Help is given on the link to the right of every step.

Remember to upload your import files to the FTP site so that WebSIM can access them for processing. To upload your import files go to the FTP site and enter your username and password. Then drag and drop your import files from the folder on your computer to the FTP site window. [Click here to go to the FTP site.](#)

Take a Tour!

Click here to find out how to use the

Fast Track Import Process



Quick Links:

[Stations Import Log](#)

[Imported Stations](#)

[Results Import Log](#)

[Imported Results](#)

[Migration Log](#)

1

[Step One:](#)

[Step 1 Help](#)

Select the Import Configuration - Select this option to select from a list of existing Import Configurations regardless of import type.

Current Status: No Configuration Selected

2

[Step Two:](#)

[Step 2 Help](#)

Select the File to be Imported - Select this option to select a file uploaded to the organization specific FTP Site.

Current Status: No Import File Selected

3

[Step Three:](#)

[Step 3 Help](#)

Import Step - Select this option to initiate the import process.

DEMO SITE

Standard STORET Station Template

Station ID	Station Name	Station Description	Primary Type	Secondary Type	Lat(dd-mm-ss.ssss)	Long(ddd-mm-ss.ssss)	GeoDat	Geo Method	State	County	HUC
SPR-1	31st Ave.	South Platte River at 31st Avenue	River/Stream		39-46-10.8000	104-58-57.5000	NAD83	UN	CO	Denver	10190003

Import Status

Import 100370 Completed Successfully

Org ID:	DEMO__02
Import Configuration:	Level 1 Stations ImpConfig Template
Import File:	Level 1 Stations.txt
Date Imported:	04/14/06
Imported Lines Processed:	8
Lines with Errors:	0
Stations Ready for Migration:	8

[Migrate Records to STORET](#)

[Delete Import from SIM](#)

[Return To Previous](#)

Pulling Data



Demo STORET Data Warehouse v2.0.5

STORET Station Descriptions

- [Stations by Geographic Location](#)
- [Stations by Organization and Station ID](#)

STORET Regular Results

(Non-Biological Physical and Chemical Result Data)

- [Regular Results by Geographic Location](#)
- [Regular Results by Station](#)
- [Regular Results by Project](#)

STORET Biological Results

- [Biological Results by Geographic Location](#)
- [Biological Results by Station](#)
- [Biological Results by Project](#)

STORET Habitat Results

- [Habitat Results by Geographic Location](#)
- [Habitat Results by Station](#)
- [Habitat Results by Project](#)



Defeating the 3 Headed Monster?



~~Financial Barriers~~



~~Technical Barriers~~



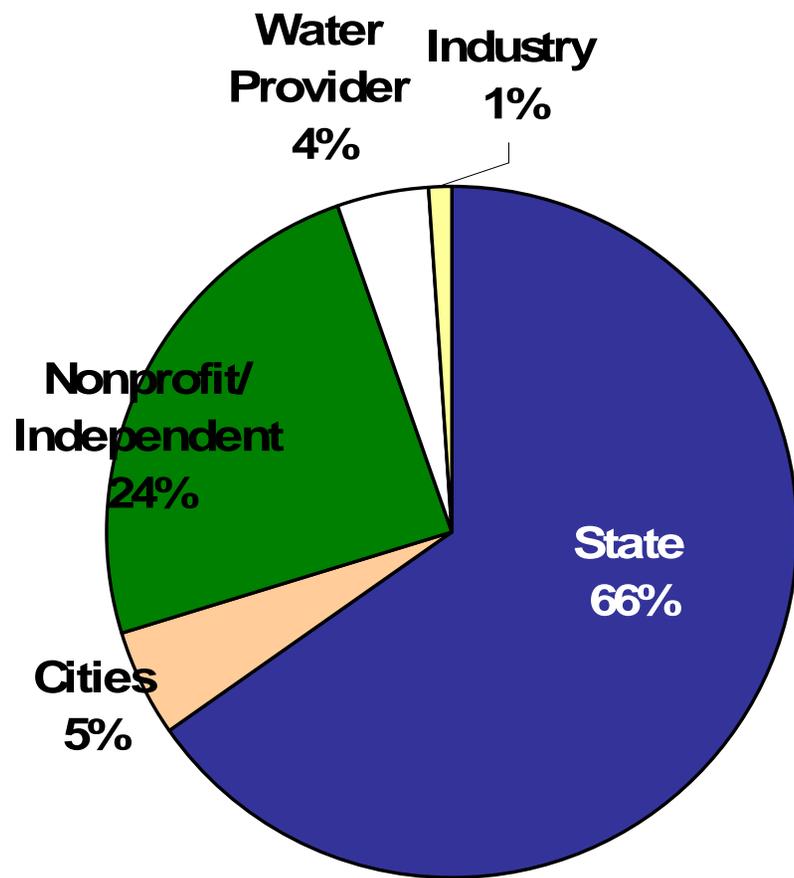
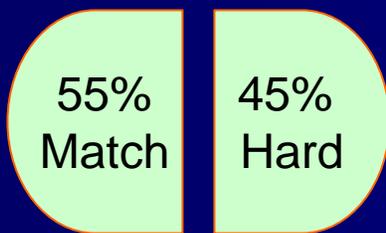
~~Lack of Time~~

Innocent Citizen that needs information

Outline of CDSN Needs & Discussion Topics

- Funding Needs
- Partnership Needs
- Discussion Topics

Costs: Approximately 100,000 annually



Cash Contributions supporting FY '08

Who is needed to keep this going?

- Beneficiaries of all 3 components
 SWAPS, Map Directory, Database
- Geographic, organization diversity
- INCLUSIVE and Relevant
- Now have new Charter
 - Participation
 - Structure
 - Goals
 - Costs
 - Funding

TIPS and Lessons Learned

1. CRITICAL MASS

1. Diverse, inclusive, relevant collaboration
2. Enough data on map & in database to be useful

2. LEADERSHIP & SUPPORT

1. Share Leadership
2. Seek support from many sources
3. Cannot be all volunteer
4. Focus on doing work, not setting up structure
5. Leverage existing technology, systems, etc.
6. Combine efforts to do broader outreach of needs

TIPS and Lessons Learned (cont...)

3. OUTREACH

1. Conduct at Appropriate Scale
2. Outreach to data generators, users, interested parties
3. Indicate how much was saved
4. Indicate sustainability

4. TECHNOLOGY

1. Hardware/Software/Hosting support
2. Data generator responsibility up front
3. Paid staff to help input data
4. Track use and users

Discussion Topics

- 1) Scale of measurable results monitoring,
- 2) Examples of projects and success stories in other states and nationally to help with a brain storm of what is next on the horizon for the CWQMC,
- 3) Our needs with regard to the WQX (water quality exchange) transition taking place with STORET,
- 4) Support in how we interact with USGS, EPA, WQCD in the state,
- 5) Continual support from national EPA and USGS to support the program,
- 6) Discussing overall need for scale and timing of monitoring in Colorado.

Questions?

System Site:

www.codsstoret.com

Website:

<http://coloradowatershed.org/CWQMC>

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Acting Chairs:

Vic Lucero, City of Thornton

Barb Horn, Colorado Division of Wildlife