Oregon GNIS Enhancement and Stewardship Project

Sheri Schneider
Oregon Geospatial Liaison
WR NSDI Partnership Office
USGS Western Region
sschneider@usgs.gov

Bill Clingman, Sr. GIS Analyst
Lane Council of Governments
bclingman@lcog.org

Milt Hill, FIT Coordinator
Geospatial Enterprise Office
OR Dept of Admin Services
milton.e.hill@state.or.us

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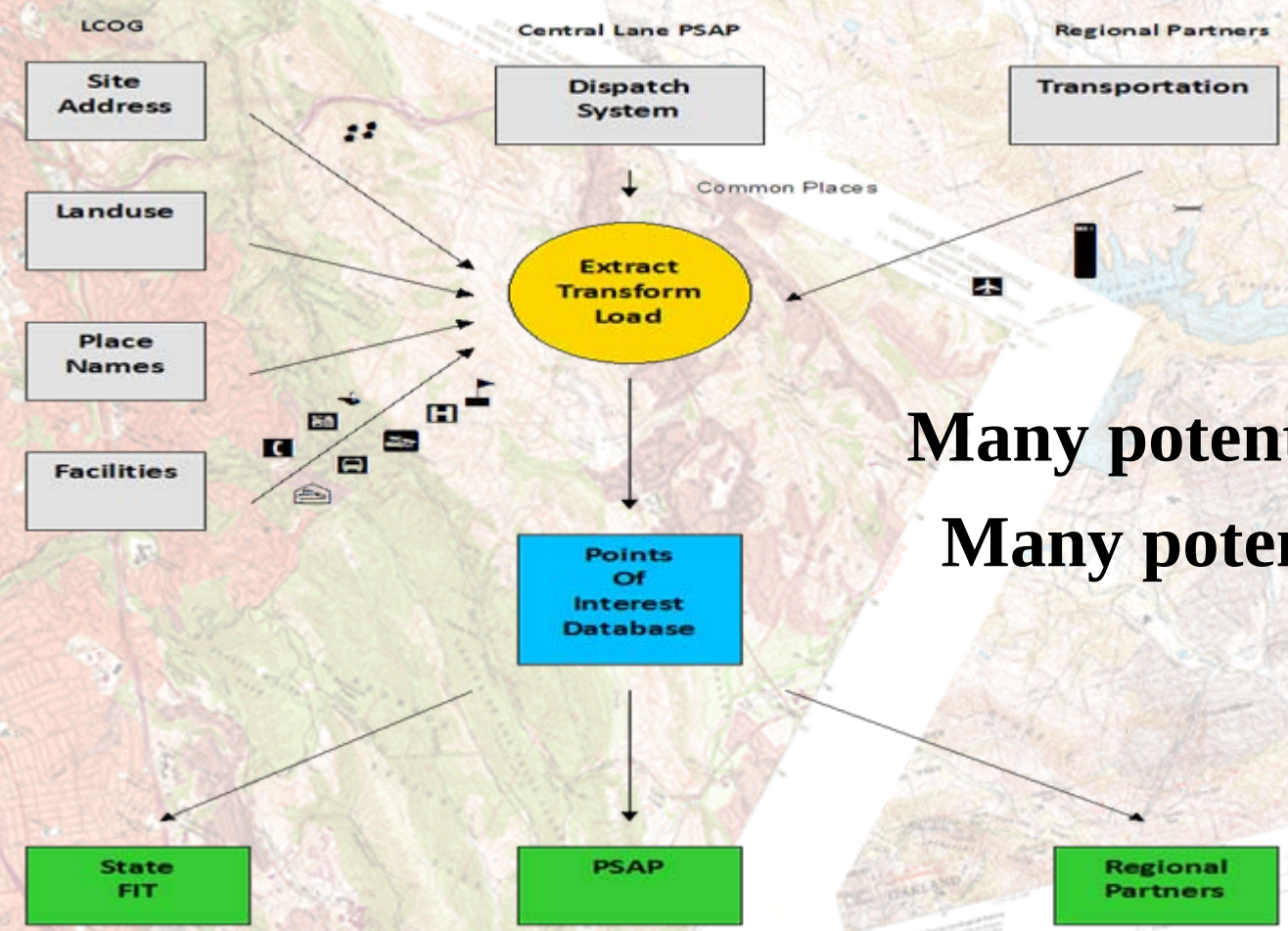
What brings us here?

Need for high-quality "landmark" data

- **Alternatives to traditional/formal addresses**
- **Common need: local, state, & federal levels**
- **Existing Framework data elements**

Local Perspective



Many potential sources

Many potential users

Oregon Framework Data Elements

Transportation Theme

- airports
- bridges
- heliports
- lighthouses
- navigation hazards
- ports

Utilities Theme

- electric generation facilities
- sanitary sewer treatment facilities
- solid waste/transfer sites
- telecommunication facilities
- water supply facilities

Preparedness Theme

- commercial key assets
- correctional facilities
- dam facilities
- emergency facilities
- emergency reference data stations
- hazardous materials sites
- health care facilities
- military facilities
- monuments/icons
- port facilities (air, sea, river)
- public bldg footprints
- public safety station locations
- rail facilities
- schools
- stadiums
- wildfire-related facilities

GEO USGS LCOG Lane Council of Governments

Characteristics/Requirements

- Single, Authoritative Source
- Data Standard and QC Policies
- Data Model and Database Structure
- Stewardship/Maintenance Plan
- Distribution Mechanism

GNIS has it all

- ✓ Single, Authoritative Source
- ✓ Data Standard and QC Policies
- ✓ Data Model and Database Structure
- ✓ Stewardship/Maintenance Plan
- ✓ Distribution Mechanism

Federal Priorities parallel our own

"Primary structures features" (NSDI):

- **Schools**
- **Hospitals**
- **Fire Stations**
- **Law Enforcement**
- **Prisons and Jails**
- **Urgent Care Centers**
- **Places of Worship**
- **Emergency Management**

Two Inter-related USGS Programs

- **Geographic Names Information System (GNIS)**

  http://geonames.usgs.gov/domestic/index.html

- **The National Map (TNM)**

  http://nationalmap.gov/

Geographic Names Information System (GNIS)

- **Federal standard for geographic nomenclature**
- **Official repository of geographic names**
- **Official vehicle for geographic names use by all departments of the Federal Government**
- **Source for applying geographic names to Federal electronic and printed products**

Geographic Names Information System (GNIS)

- **Physical and cultural geographic features of all types except roads and highways**

- **Defines feature locations by state, county, name of topographic map, and geographic coordinates**

- **Assigns unique, permanent Feature ID, *the only* standard Federal key for accessing, integrating, or reconciling feature data from multiple data sets**

Geographic Names Information System (GNIS)

- **Collects data from Federal, State, and local government agencies and other authorized contributors**
- **Provides data to all levels of government and to the public**
- **Online query, web map and feature services, file downloads, customized files on request**

U.S. Board on Geographic Names

Representatives of Federal agencies concerned with geographic information, population, ecology, and management of public lands.

http://geonames.usgs.gov/

U.S. Board on Geographic Names

- **Ensures uniformity in geographic nomenclature and usage throughout the Federal government**
- **Formulates principles, policies, and procedures for feature names standardization**
- **Serves as Federal authority for name problems, name inquiries, name changes, and proposals for new names for *places and natural features***
- **Names and locations of *cultural* features are determined by authoritative source and are *not* subject to formal Board review and decision**

GNIS Feature Categories

Feature Class	Feature Type
Airport	Admin
Arch	Place
Area	Place
Arroyo	Place
Bar	Place
Basin	Place
Bay	Place
Beach	Place
Bench	Place
Bend	Place
Bridge	Admin
Building	Admin
Canal	Place
Cape	Place
Cave	Place
Cemetery	Admin
Census	Admin
Channel	Place
Church	Admin
Civil	Admin
Cliff	Place
Crater	Place

Feature Class	Feature Type
Crossing	Admin
Dam	Admin
Falls	Place
Flat	Place
Forest	Admin
Gap	Place
Geyser	Place
Glacier	Place
Gut	Place
Harbor	Place
Hospital	Admin
Island	Place
Isthmus	Place
Lake	Place
Lava	Place
Levee	Place
Locale	Place
Military	Admin
Military (Historical)	Admin
Mine	Admin
Oilfield	Place
Park	Admin

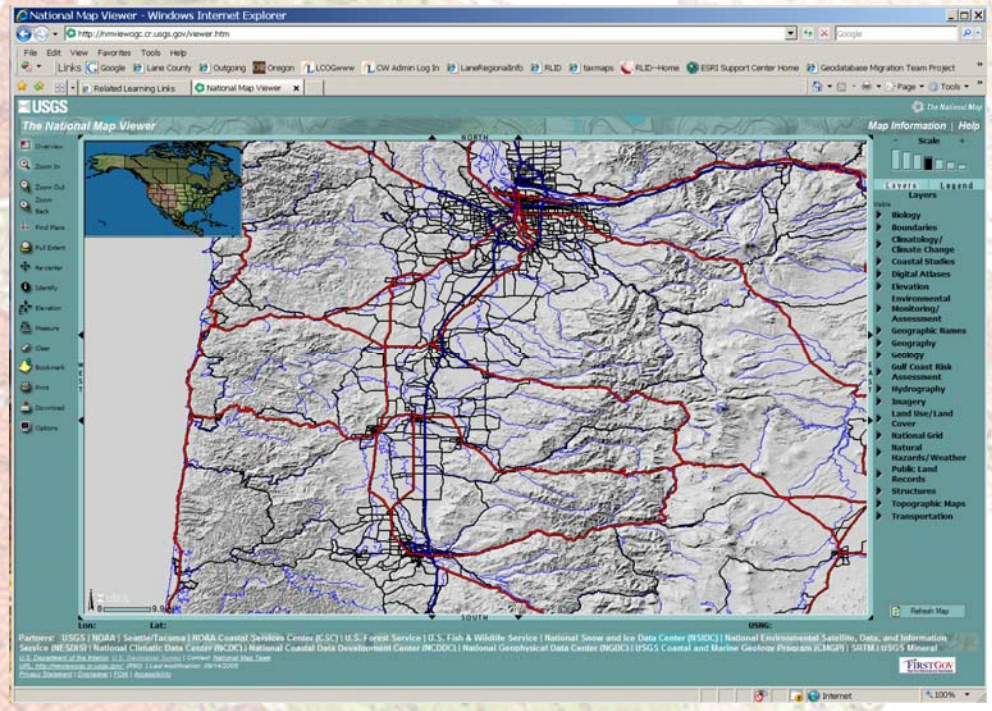
Feature Class	Feature Type
Pillar	Place
Plain	Place
Populated Place	Place
Post Office	Admin
Range	Place
Rapids	Place
Reserve	Admin
Reservoir	Place
Ridge	Place
School	Admin
Sea	Place
Slope	Place
Spring	Place
Stream	Place
Summit	Place
Swamp	Place
Tower	Admin
Trail	Admin
Tunnel	Admin
Valley	Place
Well	Admin
Woods	Place

“Admin” categories are cultural, “Places” are physical features.

The National Map (TNM)

- Collaborative effort: USGS, other Federal, State, and local partners
- Wide range of uses: recreation, science, emergency response
- Multiple delivery mechanisms: Web services, map products, downloadable data
- New generation of digital topographic maps

The National Map (TNM)

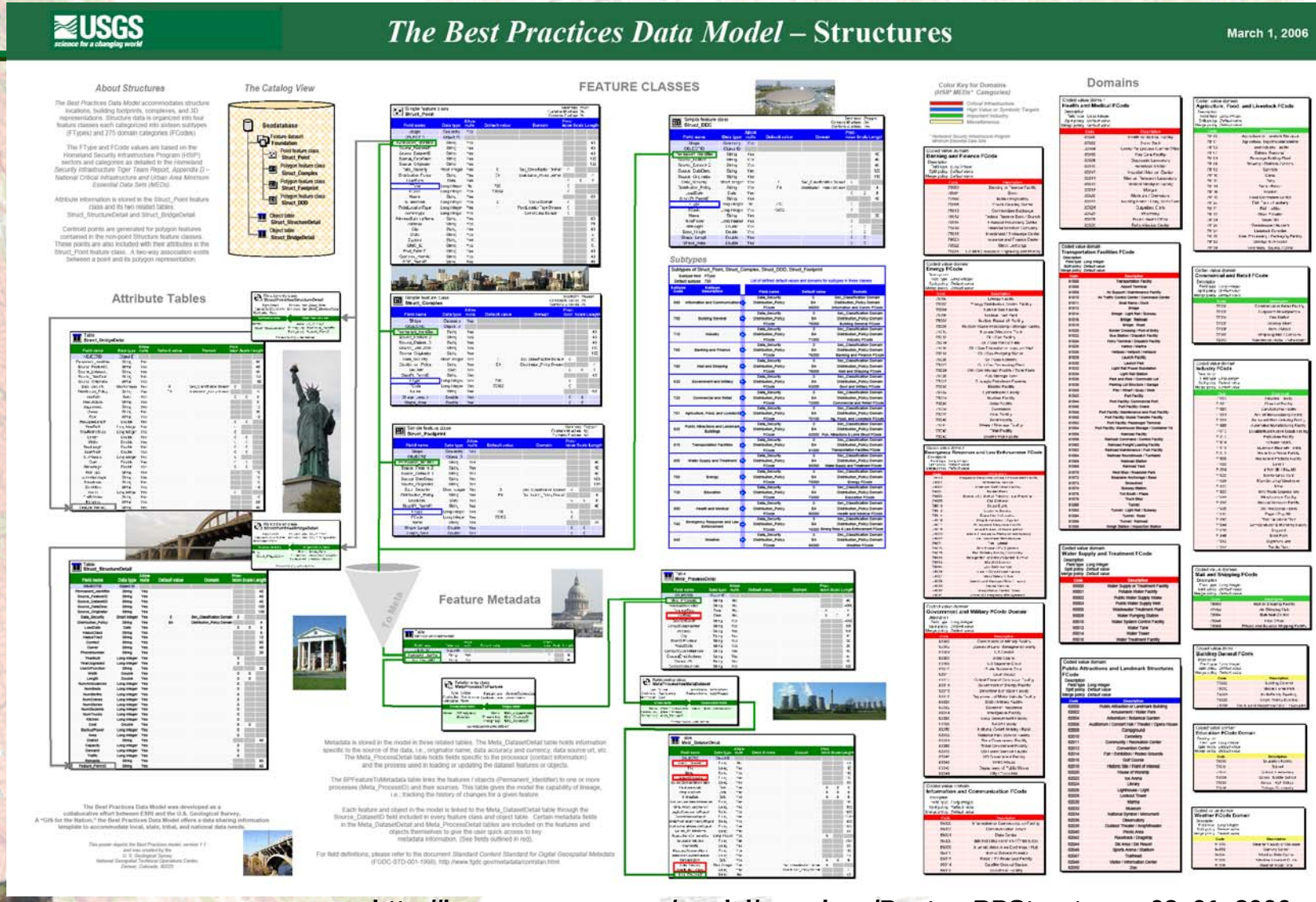


- Orthoimagery
- Elevation (NED)
- Hydrography (NHD)
- Boundaries
- Transportation
- Land Cover (NLCD)

- **Geographic Names (GNIS)**
- **Structures (NSD)**

http://nmviewogc.cr.usgs.gov/viewer.htm

National Structures Dataset (NSD)



http://bpgeo.cr.usgs.gov/model/acrodocs/Poster_BPStructures_03_01_2006.pdf

USGS LCOG
Lane Council of Governments

National Structures Dataset (NSD)

FType	FType_Description	FCode	FCode_Description	GNIS_Feature Class
730	Education	73002	School	School
		73003	School: Elementary	School
		73004	School: Middle School	School
		73005	School: High School	School
		73006	College / University	School
740	Emergency Response and Law Enforcement	74017	Emergency Operations Center	Building
		74026	Fire Station / EMS Station	Building
		74032	Marshal Service	Building
		74034	Law Enforcement	Building
		74036	Prison / Correctional Facility	Building
750	Energy	75030	Electric Facility	Building
		75032	Hydroelectric Facility	Building / Locale
		75034	Nuclear Facility	Building / Locale
		75036	Solar Facility	Building
		75038	Substation	Locale
		75039	Coal Facility	Locale
		75040	Wind Facility	Locale
		75041	Waste / Biomass Facility	Locale
		75042	Tidal Facility	Locale
		75043	Geothermal Facility	Locale
780	Mail and Shipping	78004	Bulk Mail Center	Post Office
		78006	Post Office	Post Office
800	Health and Medical	80009	Emergency Shelter	Building / Locale
		80012	Hospital / Medical Center	Hospital

278 Categories organized into 16 Groups

National Structures Dataset (NSD)

FType	FType_Description	FCode	FCode_Description	GNIS_Feature Class
810	Transportation Facilities	81006	Airport Terminal	Building
		81008	Air Support / Maintenance Facility	Building
		81010	Air Traffic Control Center / Command Center	Building / Tower
		81011	Boat Ramp / Dock	Locale / Park
		81012	Bridge	Bridge
		81014	Bridge: Light Rail / Subway	Bridge
		81016	Bridge: Railroad	Bridge
		81018	Bridge: Road	Bridge
		81022	Bus Station / Dispatch Facility	Locale
		81024	Ferry Terminal / Dispatch Facillity	Locale / Building
		81025	Harbor / Marina	Harbor
		81026	Helipad / Heliport / Helispot	Airport
		81032	Light Rail Power Substation	Locale
		81034	Light Rail Station	Locale
		81040	Pier / Wharf / Quay / Mole	Locale
		81052	Port Facility: Passenger Terminal	Locale
		81066	Railroad Station	Building / Locale
		81068	Railroad Yard	Locale
		81070	Rest Stop / Roadside Park	Locale / Park
		81074	Subway Station	Locale
		81076	Toll Booth / Plaza	Locale
		81080	Tunnel	Tunnel
		81082	Tunnel: Light Rail / Subway	Tunnel
		81084	Tunnel: Road	Tunnel
		81086	Tunnel: Railroad	Tunnel

278 Categories organized into 16 Groups

National Structures Dataset (NSD)

FType	FType_Description	FCode	FCode_Description	GNIS_Feature Class
820	Public Attractions and Landmark Structures	82006	Auditorium / Concert Hall / Theater / Opera House	Building
		82008	Campground	Locale
		82010	Cemetery	Cemetery
		82011	Community / Recreation Center	Building
		82012	Convention Center	Building
		82014	Fair / Exhibition / Rodeo Grounds	Locale
		82020	House of Worship	Church
		82022	Ice Arena	Building
		82024	Library	Building
		82026	Lighthouse / Light	Locale / Building
		82030	Marina	Locale
		82032	Museum	Building
		82038	Outdoor Theater / Amphitheater	Building or Locale
		82042	Racetrack / Dragstrip	Locale / Park
		82046	Sports Arena / Stadium	Park
830	Government and Military	83034	State Government Facility	Building
		83036	Tribal Government Facility	Building
		83040	US Government Facility	Building / Post Office
850	Water Supply and Treatment	85002	Public Water Supply Intake	Building / Locale / Reservoir / Well
		85004	Public Water Supply Well	Well
		85006	Wastewater Treatment Plant	Building / Locale
		85008	Water Pumping Station	Building / Locale
		85012	Water Tank	Reservoir
		85014	Water Tower	Tower
		85016	Water Treatment Facility	Locale / Building

278 Categories organized into 16 Groups

USGS Timeline

- 1890: U.S. Board on Geographic Names
- 1975: Geographic Names Information System
- 1987: GNIS designated as official Federal source of place/feature names & locations
- 2006: GNIS Feature ID supersedes FIPS Codes
- Today: GNIS and TNM database integration

From Topos to *The National Map*

For over a century, the U.S. Board on Geographic Names assured consistency and accuracy of geographic names on USGS Topographic Maps.

For thirty years, the Geographic Names Information System has been the primary mechanism for accomplishing this purpose.

Now *The National Map* will carry on with ANSI standard feature IDs, names, and locations.

How can we help?

- Take “ownership” of GNIS features in Oregon
- Improve existing GNIS information
- Add additional features to GNIS
- Utilize expert and local knowledge
- Leverage existing Framework partnerships
- Compile and provide local (city/county) data
- Promote the use of GNIS and TNM by state and local agencies throughout Oregon

Federal

USGS The National Map GNIS

State

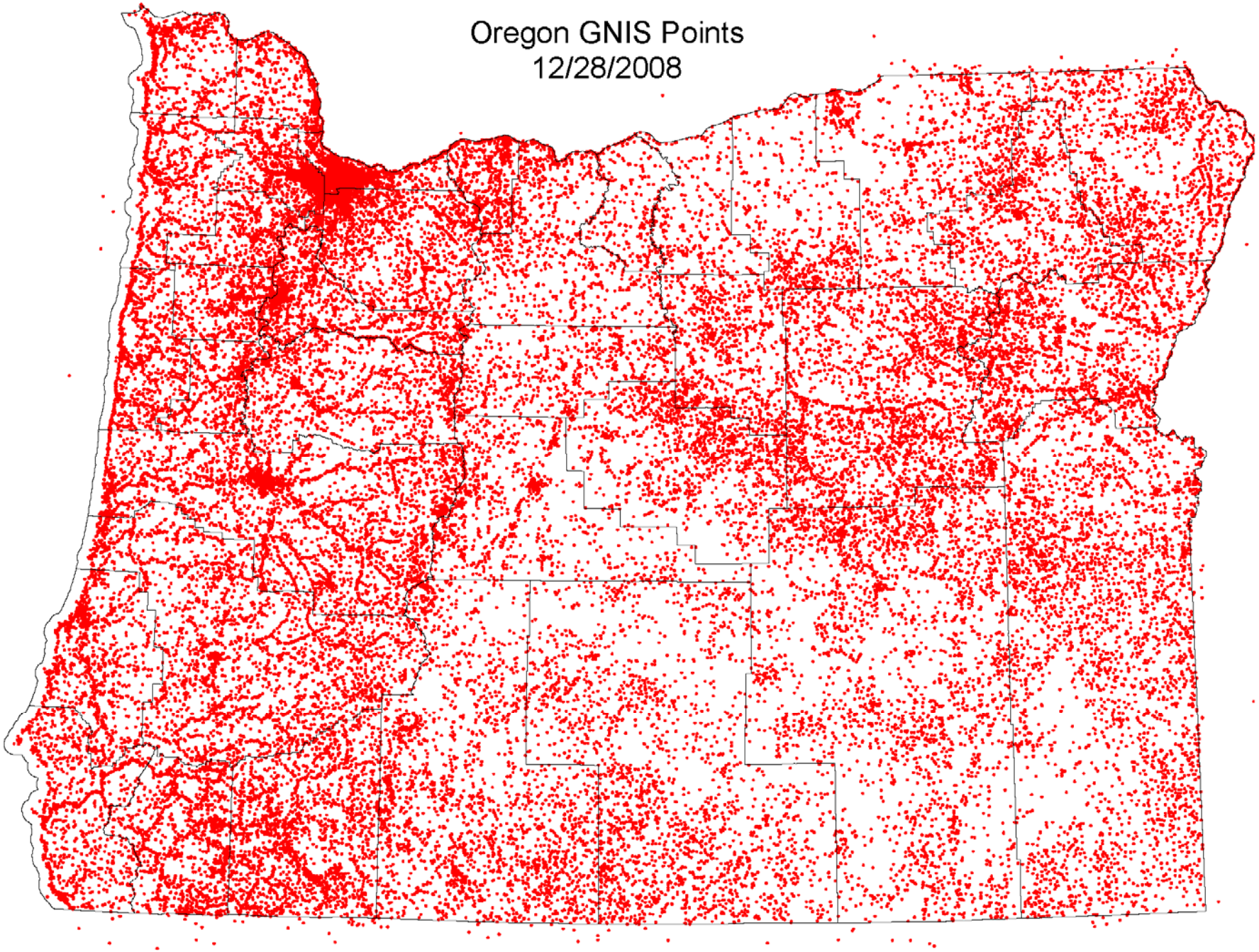
Oregon GIS Framework

HAZ-Prep FIT

Local

Oregon GNIS Today

- **55,391 features** as of 12/28/08 for Oregon
- **42,158 Place features** (Board of Geographic Names does have authority, over the *names*)
- **13,233 Administrative features** (Board of Geographic Names does not take responsibility)

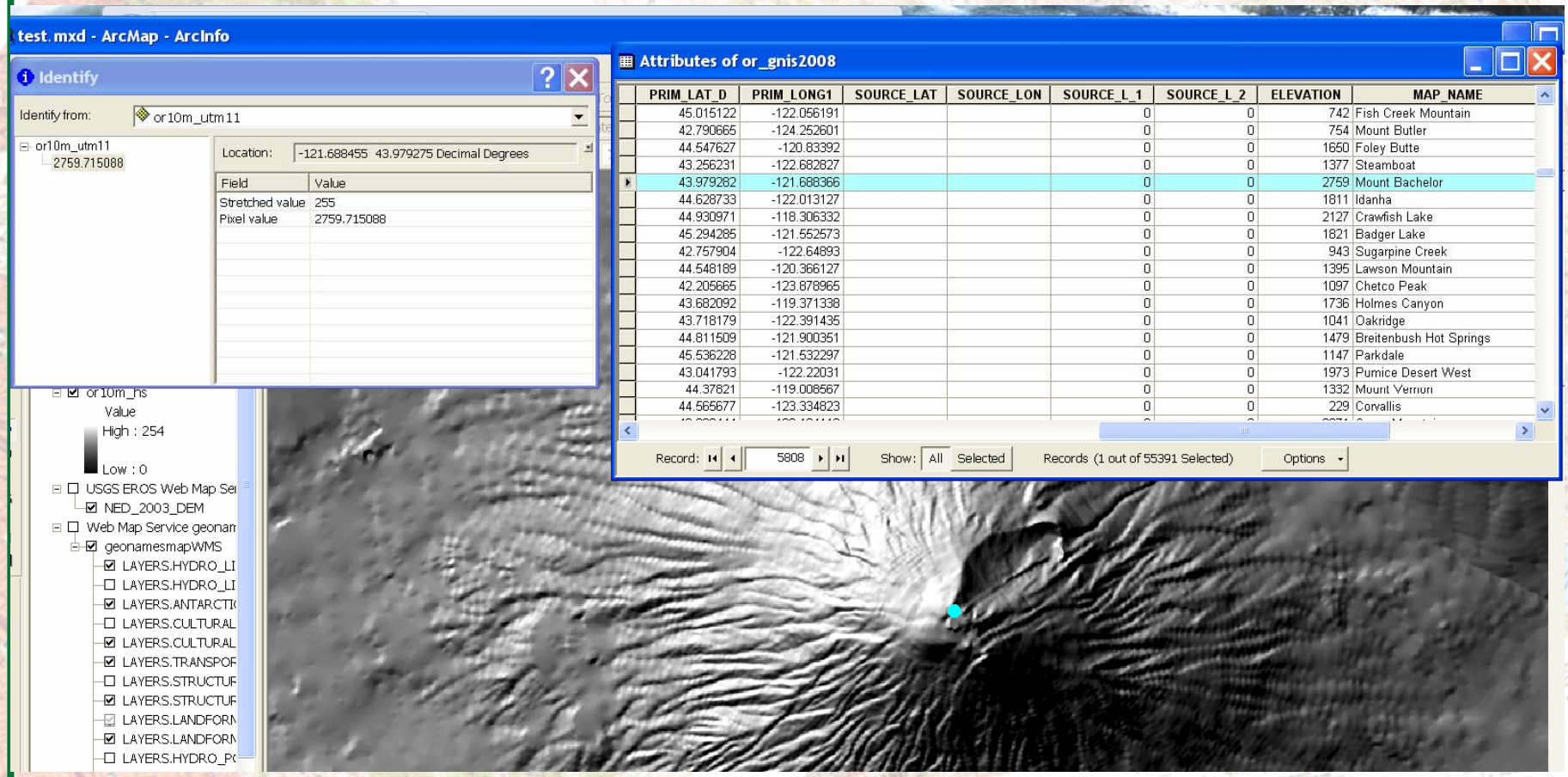

Oregon GNIS Points
12/28/2008

Breakdown of features currently in Oregon GNIS

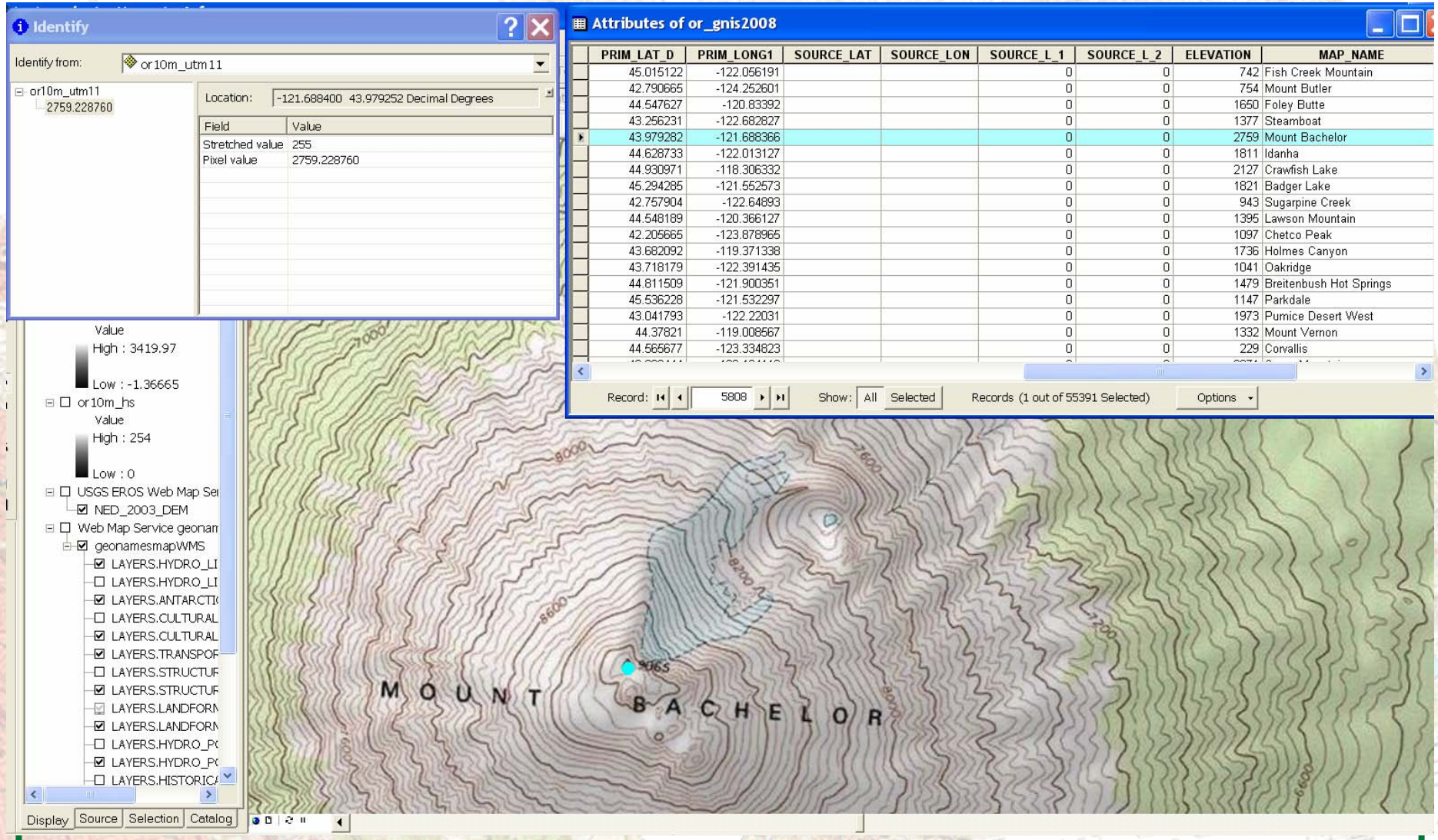
Feature Class	Feature Type	Count in Oregon
Airport	Admin	370
Arch	Place	15
Area	Place	146
Arroyo	Place	3
Bar	Place	156
Basin	Place	301
Bay	Place	146
Beach	Place	51
Bench	Place	23
Bend	Place	79
Bridge	Admin	206
Building	Admin	361
Canal	Place	661
Cape	Place	228
Cave	Place	0
Cemetery	Admin	1133
Census	Admin	280
Channel	Place	162
Church	Admin	1171
Civil	Admin	290
Cliff	Place	183
Crater	Place	22
Crossing	Admin	79
Dam	Admin	739
Falls	Place	229
Flat	Place	1346
Forest	Admin	34
Gap	Place	314
Geyser	Place	1
Glacier	Place	36
Gut	Place	65
Harbor	Place	9
Hospital	Admin	69

Feature Class	Feature Type	Count in Oregon
Island	Place	332
Isthmus	Place	1
Lake	Place	1779
Lava	Place	15
Levee	Place	10
Locale	Place	6059
Military	Admin	8
Military (Historical)	Admin	57
Mine	Admin	589
Oilfield	Place	0
Park	Admin	2443
Pillar	Place	192
Plain	Place	18
Populated Place	Place	1560
Post Office	Admin	2074
Range	Place	49
Rapids	Place	233
Reserve	Admin	62
Reservoir	Place	3515
Ridge	Place	895
School	Admin	2032
Sea	Place	1
Slope	Place	35
Spring	Place	4411
Stream	Place	12217
Summit	Place	3518
Swamp	Place	148
Tower	Admin	226
Trail	Admin	731
Tunnel	Admin	9
Valley	Place	2987
Well	Admin	270
Woods	Place	7

GNIS Example – Mount Bachelor

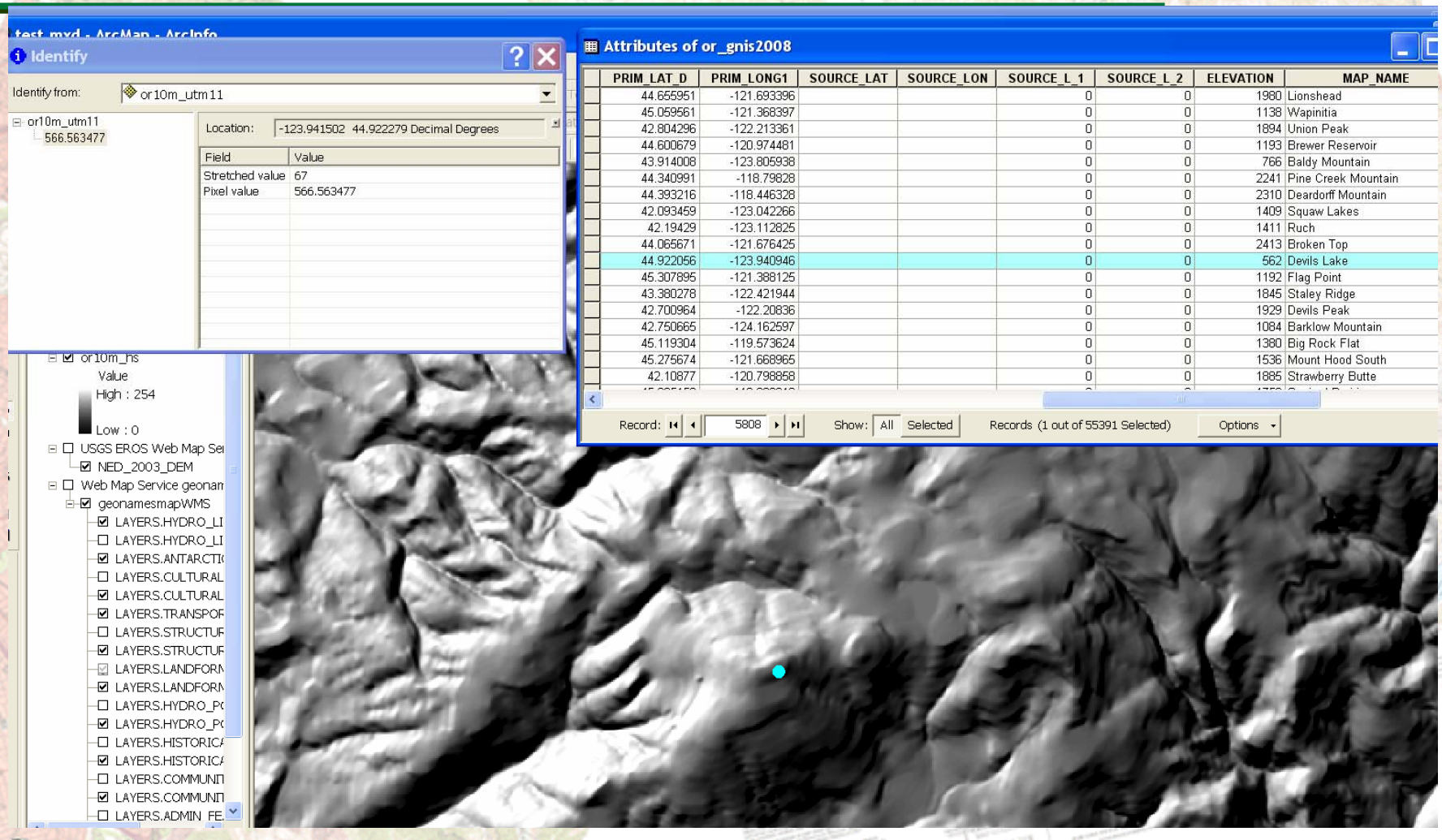


PRIM_LAT_D	PRIM_LONG1	SOURCE_LAT	SOURCE_LON	SOURCE_L_1	SOURCE_L_2	ELEVATION	MAP_NAME
45.015122	-122.056191			0	0	742	Fish Creek Mountain
42.790665	-124.252601			0	0	754	Mount Butler
44.547627	-120.83392			0	0	1650	Foley Butte
43.256231	-122.682827			0	0	1377	Steamboat
43.979282	-121.688366			0	0	2759	Mount Bachelor
44.628733	-122.013127			0	0	1811	Idanha
44.930971	-118.306332			0	0	2127	Crawfish Lake
45.294285	-121.552573			0	0	1821	Badger Lake
42.757904	-122.64893			0	0	943	Sugarpine Creek
44.548189	-120.366127			0	0	1395	Lawson Mountain
42.205665	-123.878965			0	0	1097	Chetco Peak
43.682092	-119.371338			0	0	1736	Holmes Canyon
43.718179	-122.391435			0	0	1041	Oakridge
44.811509	-121.900351			0	0	1479	Breitenbush Hot Springs
45.536228	-121.532297			0	0	1147	Parkdale
43.041793	-122.22031			0	0	1973	Pumice Desert West
44.37821	-119.008567			0	0	1332	Mount Vernon
44.565677	-123.334823			0	0	229	Corvallis

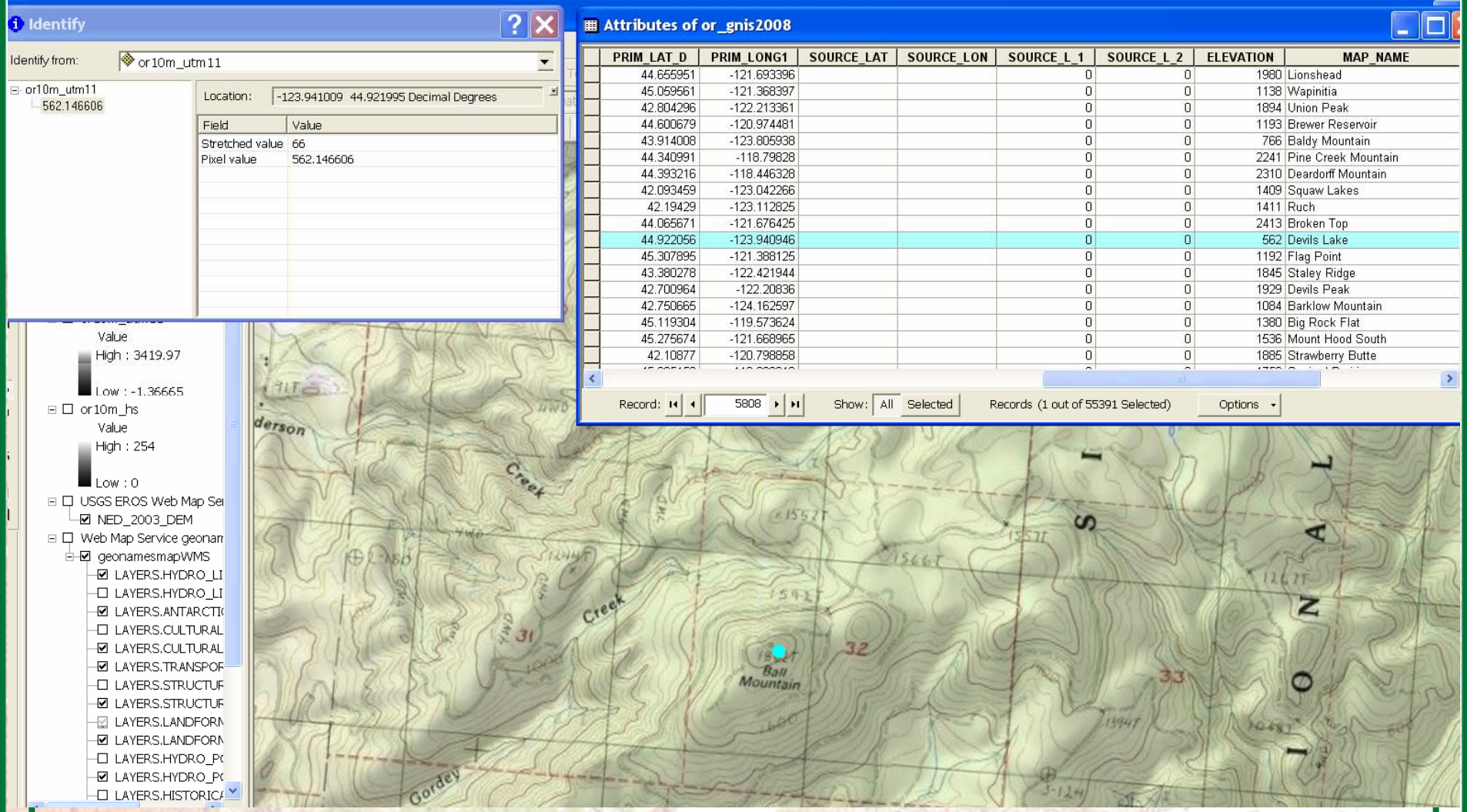


9065 feet = **2763.012 m**

GNIS Example – Ball Mountain



PRIM_LAT_D	PRIM_LONG1	SOURCE_LAT	SOURCE_LON	SOURCE_L_1	SOURCE_L_2	ELEVATION	MAP_NAME
44.655951	-121.693396			0	0	1980	Lionshead
45.059561	-121.368397			0	0	1138	Wapinitia
42.804296	-122.213361			0	0	1894	Union Peak
44.600679	-120.974481			0	0	1193	Brewer Reservoir
43.914008	-123.805938			0	0	766	Baldy Mountain
44.340991	-118.79828			0	0	2241	Pine Creek Mountain
44.393216	-118.446328			0	0	2310	Deardorff Mountain
42.093459	-123.042266			0	0	1409	Squaw Lakes
42.19429	-123.112825			0	0	1411	Ruch
44.065671	-121.676425			0	0	2413	Broken Top
44.922056	-123.940946			0	0	562	Devils Lake
45.307895	-121.388125			0	0	1192	Flag Point
43.380278	-122.421944			0	0	1845	Staley Ridge
42.700964	-122.20836			0	0	1929	Devils Peak
42.750665	-124.162597			0	0	1084	Barklow Mountain
45.119304	-119.573624			0	0	1380	Big Rock Flat
45.275674	-121.668965			0	0	1536	Mount Hood South
42.10877	-120.798858			0	0	1885	Strawberry Butte



PRIM_LAT_D	PRIM_LONG1	SOURCE_LAT	SOURCE_LON	SOURCE_L_1	SOURCE_L_2	ELEVATION	MAP_NAME
44.655951	-121.693396			0	0	1980	Lionshead
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42.19429	-123.112825			0	0	1411	Ruch
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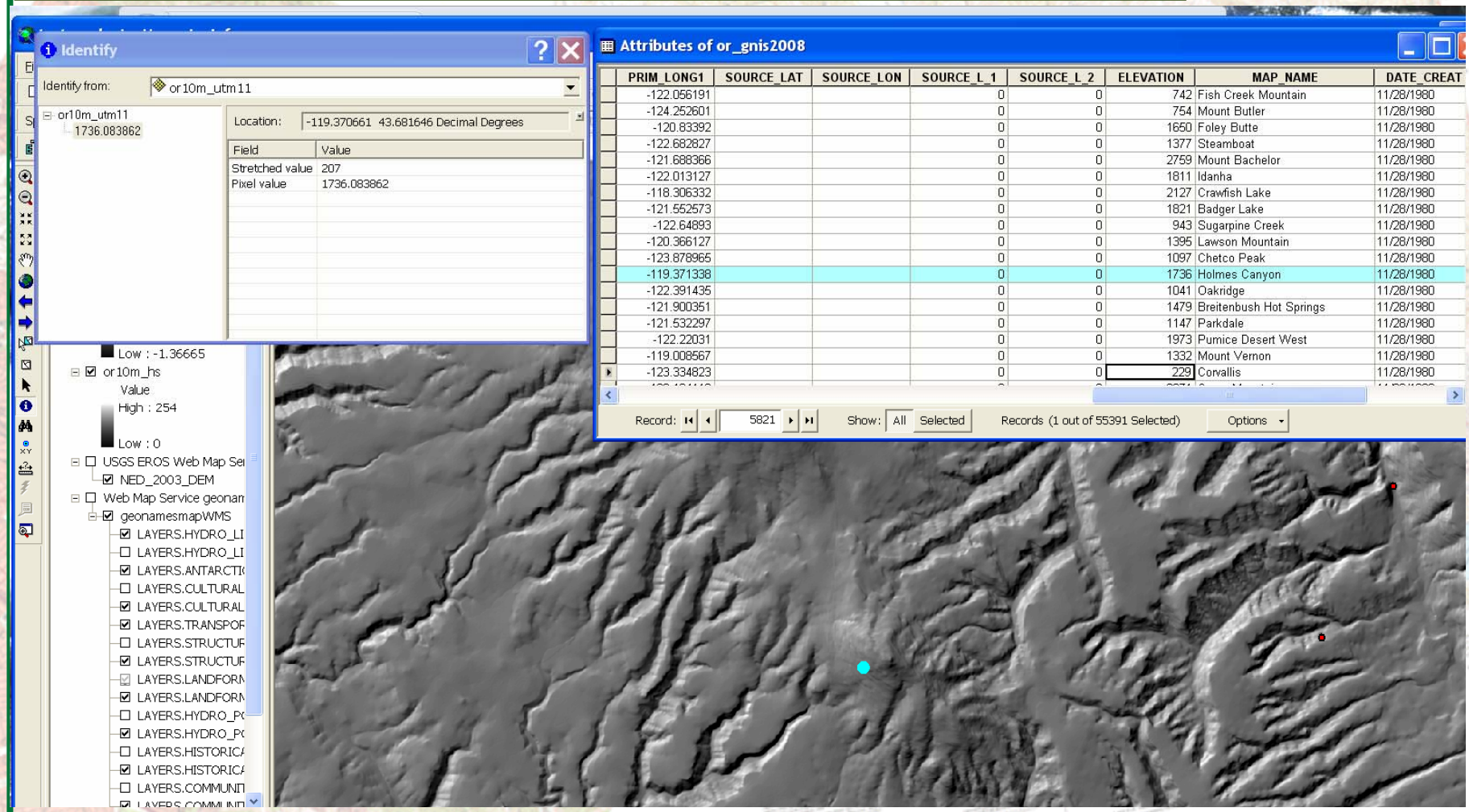
44.922056	-123.940946			0	0	562	Devils Lake
45.307895	-121.388125			0	0	1192	Flag Point
43.380278	-122.421944			0	0	1845	Staley Ridge
42.700964	-122.20836			0	0	1929	Devils Peak
42.750665	-124.162597			0	0	1084	Barklow Mountain
45.119304	-119.573624			0	0	1380	Big Rock Flat
45.275674	-121.668965			0	0	1536	Mount Hood South
42.10877	-120.798858			0	0	1885	Strawberry Butte

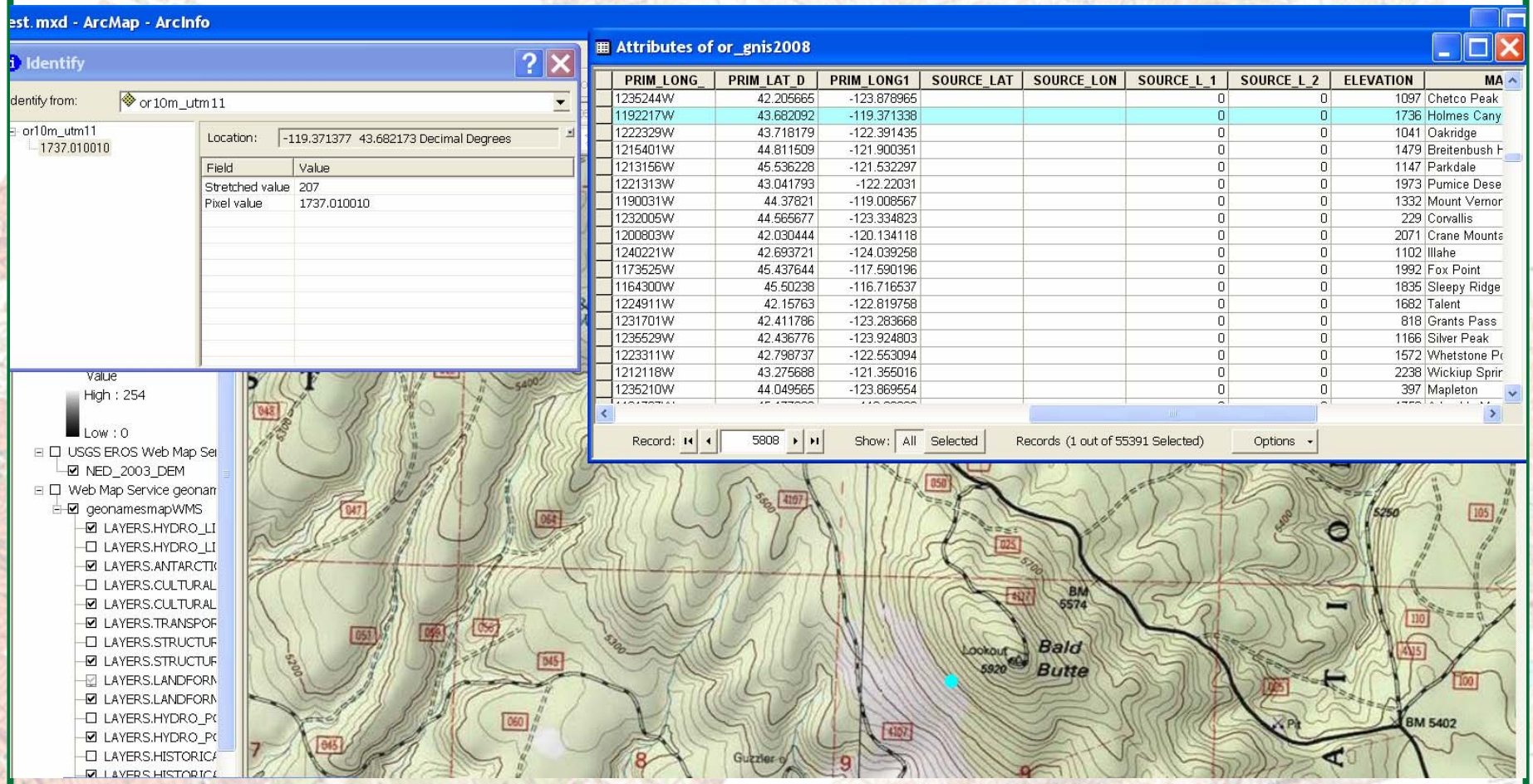
1862 feet = **567.537 m**

Point is about 50 meters off from topo location

GNIS Example – Bald Butte



PRIM_LONG1	SOURCE_LAT	SOURCE_LON	SOURCE_L_1	SOURCE_L_2	ELEVATION	MAP_NAME	DATE_CREAT
-122.056191			0	0	742	Fish Creek Mountain	11/28/1980
-124.252601			0	0	754	Mount Butler	11/28/1980
-120.83392			0	0	1650	Foley Butte	11/28/1980
-122.682827			0	0	1377	Steamboat	11/28/1980
-121.688366			0	0	2759	Mount Bachelor	11/28/1980
-122.013127			0	0	1811	Idanha	11/28/1980
-118.306332			0	0	2127	Crawfish Lake	11/28/1980
-121.552573			0	0	1821	Badger Lake	11/28/1980
-122.64893			0	0	943	Sugarpine Creek	11/28/1980
-120.366127			0	0	1395	Lawson Mountain	11/28/1980
-123.878965			0	0	1097	Chetco Peak	11/28/1980
-119.371338			0	0	1736	Holmes Canyon	11/28/1980
-122.391435			0	0	1041	Oakridge	11/28/1980
-121.900351			0	0	1479	Breitenbush Hot Springs	11/28/1980
-121.532297			0	0	1147	Parkdale	11/28/1980
-122.22031			0	0	1973	Pumice Desert West	11/28/1980
-119.008567			0	0	1332	Mount Vernon	11/28/1980
-123.334823			0	0	229	Corvallis	11/28/1980



PRIM_LONG_	PRIM_LAT_D	PRIM_LONG1	SOURCE_LAT	SOURCE_LON	SOURCE_L_1	SOURCE_L_2	ELEVATION	MA
1235244W	42.205665	-123.878965			0	0	1097	Chetco Peak
1192217W	43.682092	-119.371338			0	0	1736	Holmes Cany
1222329W	43.718179	-122.391435			0	0	1041	Oakridge
1215401W	44.811509	-121.900351			0	0	1479	Breitenbush H
1213156W	45.536228	-121.532297			0	0	1147	Parkdale
1221313W	43.041793	-122.22031			0	0	1973	Pumice Dese
1190031W	44.37821	-119.008567			0	0	1332	Mount Vernor
1232005W	44.565677	-123.334823			0	0	229	Corvallis
1200803W	42.030444	-120.134118			0	0	2071	Crane Mounta
1240221W	42.693721	-124.039258			0	0	1102	Illahe
1173525W	45.437644	-117.590196			0	0	1992	Fox Point
1164300W	45.50238	-116.716537			0	0	1835	Sleepy Ridge
1224911W	42.15763	-122.819758			0	0	1682	Talent
1231701W	42.411786	-123.283668			0	0	818	Grants Pass
1235529W	42.436776	-123.924803			0	0	1166	Silver Peak
1223311W	42.798737	-122.553094			0	0	1572	Whetstone P
1212118W	43.275688	-121.355016			0	0	2238	Wickiup Sprir
1235210W	44.049565	-123.869554			0	0	397	Mapleton

5920 feet = **1804.416 m**

Point is about 293 meters off from topo location

Oregon GNIS Features

	Created	Edited
Admin	13233	1409
Place	42158	479
Total	55391	1888

Year Edited	Total
2005	75
2006	91
2007	86
2008	1636
Total	**1888**

Most features are *Places*, but *Admin* features have received more editing in recent years

Oregon GNIS Features

Year	Number Created	Recently Edited
1979	128	1
1980	30679	1149
1981	77	32
1986	9910	388
1989	181	
1990	86	
1991	2471	33
1992	1062	8
1993	2465	87
1994	3476	97
1995	254	9
1996	82	

Year	Number Created	Recently Edited
1997	12	
1998	9	
1999	172	2
2000	66	19
2001	301	2
2002	251	2
2003	175	16
2004	603	20
2005	288	7
2006	137	5
2007	25	
2008	2481	11
Total	**55391**	**1888**

Existing Stewardship Roles

- **Oregon Geographic Names Board (OGNB)**
  - **Authority for Place Names in Oregon**
- **USFS**
  - **Facilities & Place Names on National Forests**
- **BLM**
  - **Facilities and Place Names on BLM lands**
- **USGS**
  - **Recent project to add schools, for example**
  - **Oversight/Administration/Hosting of GNIS**

GNIS in Other States: Montana

The National Center for Landscape Fire Analysis (NCLFA) at the University of Montana

- **Incorporate GNIS into the Montana Wildland Fire Base Map**
- **Design a data model for a Montana-specific GNIS**
- **Initiate discussion of establishing state stewardship of GNIS in Montana**
- **Analyze GNIS against existing Montana data**

Comparison of GNIS against Montana data

Points Analyzed	4289		Represented only 5% of total
Points in Error	1747	40.70%	
Positional Errors	1592	37.10%	Based on National Map Accuracy Standards, 67 feet @ 24k
Class Errors	76	1.80%	
Name Errors	74	1.70%	Mis-matches, probably not actual errors in GNIS names
Duplication Errors	94	2.20%	Includes valid duplicates, such as "Hidden Lake"

Other Montana Recommendations

- **Development of a State GNIS data model**
  - **Additional state features (unique key requirement)**
  - **Additional state attributes**
  - **Additional state tables**

- **Stewardship of a separate State GNIS**
  - **Daily synchronization with federal GNIS**
  - **Mechanisms for update and distribution**

But in Oregon we might decide differently

"Things look different here"

USGS LCOG
Lane Council of Governments

What might Stewardship look like?

PNW Hydro Clearinghouse as Analogy

- ✓ **Data Model**
- ✓ **Data Standards**
- ✓ **Database structure and host**
- ✓ **Distributed Stewardship**

The rest is up to us!

- **Questions?**
- **Discussion**

We need your participation in an ongoing conversation!

Sheri Schneider
Oregon Geospatial Liaison
WR NSDI Partnership Office
USGS Western Region
sschneider@usgs.gov

Bill Clingman, Sr. GIS Analyst
Lane Council of Governments
bclingman@lcog.org

Milt Hill, FIT Coordinator
Geospatial Enterprise Office
OR Dept of Admin Services
milton.e.hill@state.or.us