DIGITAL MAPPING TECHNIQUES 2013

The following was presented at DMT'13
(June 2-5, 2013 - Colorado Geological Survey and Colorado School of Mines
Golden, CO)

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2013)

http://ngmdb.usgs.gov/info/dmt/

ArcGIS for Landscape

A Preview

June 3, 2013

DMT, Golden Colorado

Charlie Frye, Esri, Redlands

Larry Batten, Esri Denver

Overview

- Goals
- Demos
- Who Benefits?
- What Content will be included?
- Status

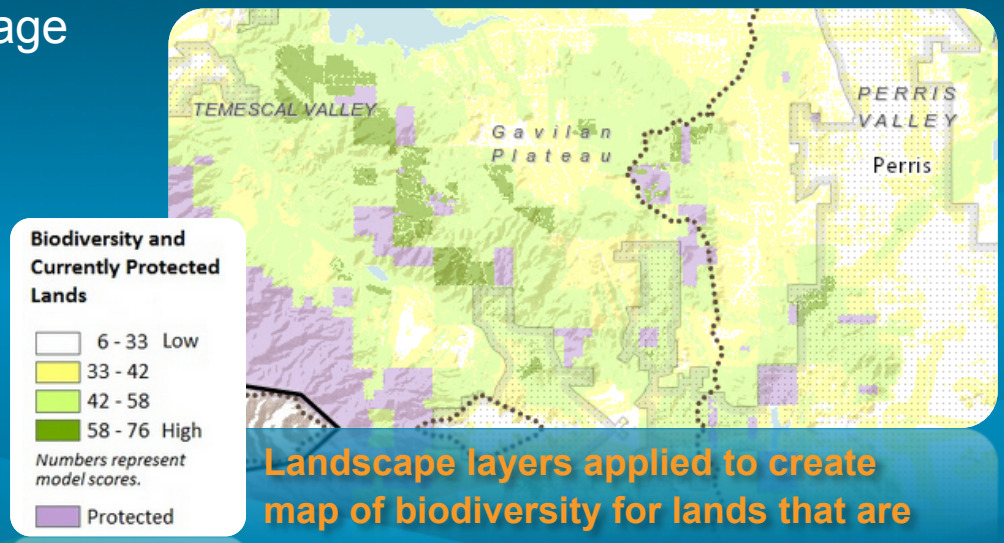
Goal #1

- **Ready to Use Data; this means no more:**
  - **Downloading tiles** (wasted space)
  - **"Stitching" or Mosaic'ing tiles into seamless datasets** *(errors result from users not knowing best practices regarding processing, projecting, and resampling)*
  - **Fixing the obvious errors; misclassification, spelling, NULLs, etc.** *(redundant time invested by every user who cares)*
  - ***Not*** **fixing the obvious errors…** *(propagation of faulty results by everyone who may not know enough to care)*

End the cycle of redundantly making data ready for GIS

Goal #2

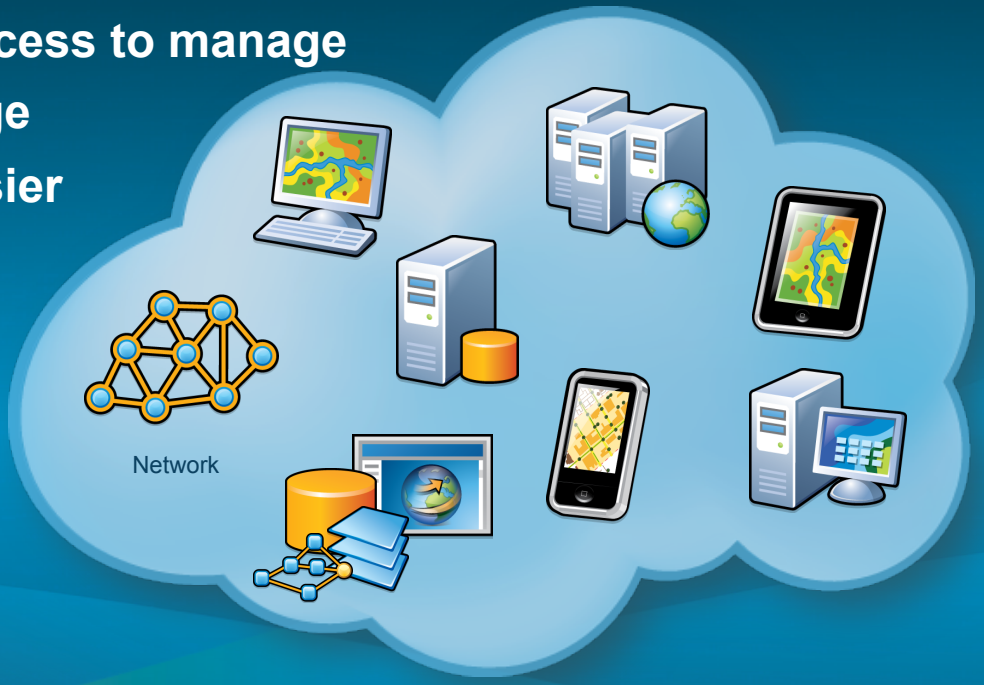
- **Provide foundational data on ArcGIS Online useful for biogeographic analysis, natural resource management, land use planning and conservation at regional and national scales**
  - Content that works across the ArcGIS platform
  - Initial coverage for the U.S.
  - Ultimately worldwide coverage



Landscape layers applied to create map of biodiversity for lands that are not currently protected.

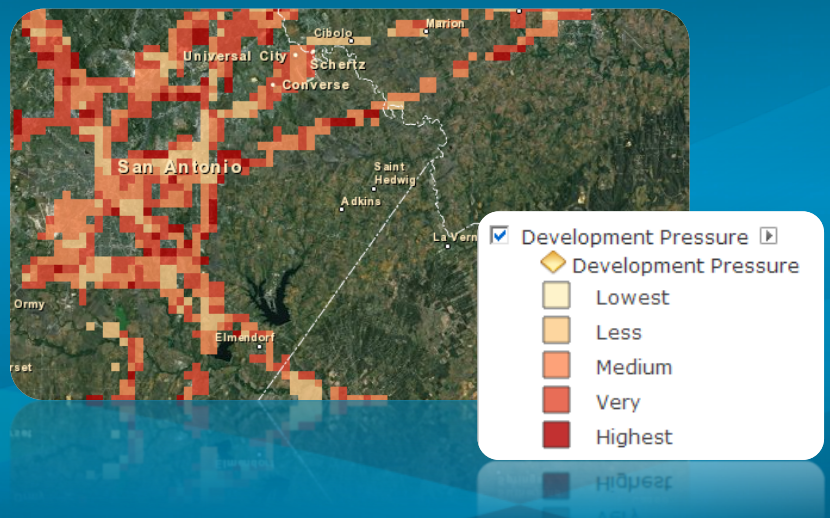
Goal #3

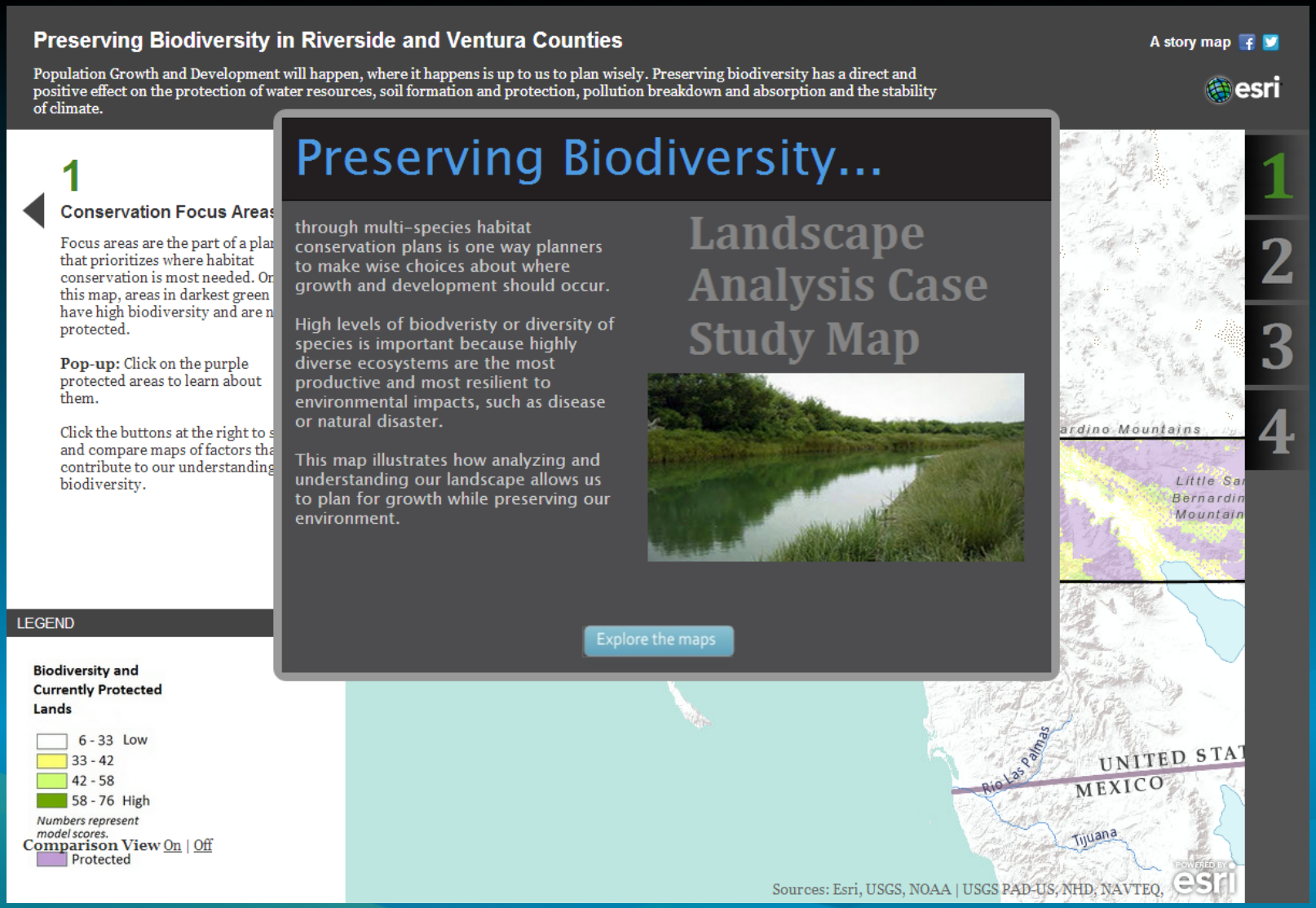
- Begin moving GIS from your hard drive and local workstation to the Cloud
  - More efficient storage
  - Fewer tiers of access to manage
  - On-demand usage
  - Publishing is easier
  - It's everywhere



Demos

- **Biodiversity**
  - Concept - to show the public how the analysis worked.
  - Inputs
  - Analysis
- **Development Pressure**
  - Concept – to show how the pattern of development pressure varies from place to place
  - Inputs
  - Analysis




Preserving Biodiversity in Riverside and Ventura Counties
A story map
Population Growth and Development will happen, where it happens is up to us to plan wisely. Preserving biodiversity has a direct and positive effect on the protection of water resources, soil formation and protection, pollution breakdown and absorption and the stability of climate.
esri
1
Conservation Focus Areas
Focus areas are the part of a plan that prioritizes where habitat conservation is most needed. On this map, areas in darkest green have high biodiversity and are n protected.
Pop-up: Click on the purple protected areas to learn about them.
Click the buttons at the right to s and compare maps of factors tha contribute to our understanding biodiversity.
Preserving Biodiversity...
through multi-species habitat conservation plans is one way planners to make wise choices about where growth and development should occur.
High levels of biodveristy or diversity of species is important because highly diverse ecosystems are the most productive and most resilient to environmental impacts, such as disease or natural disaster.
This map illustrates how analyzing and understanding our landscape allows us to plan for growth while preserving our environment.
Landscape Analysis Case Study Map
Explore the maps
1
2
3
4
ardino Mountains
Little San Bernardino Mountains
LEGEND
Biodiversity and Currently Protected Lands
6 - 33 Low
33 - 42
42 - 58
58 - 76 High
Numbers represent model scores.
Comparison View On | Off
Protected
Rio Las Palmas
UNITED STATES
MEXICO
Tijuana
Sources: Esri, USGS, NOAA | USGS PAD-US, NHD, NAVTEQ,
esri

Preserving Biodiversity in Riverside and Ventura Counties

A story map

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esri

1

Conservation Focus Areas

Focus areas are the part of a plan that prioritizes where habitat conservation is most needed. On this map, areas in darkest green have high biodiversity and are not protected.

Pop-up: Click on the purple protected areas to learn about them.

Click the buttons at the right to see and compare maps of factors that contribute to our understanding of biodiversity.

LEGEND

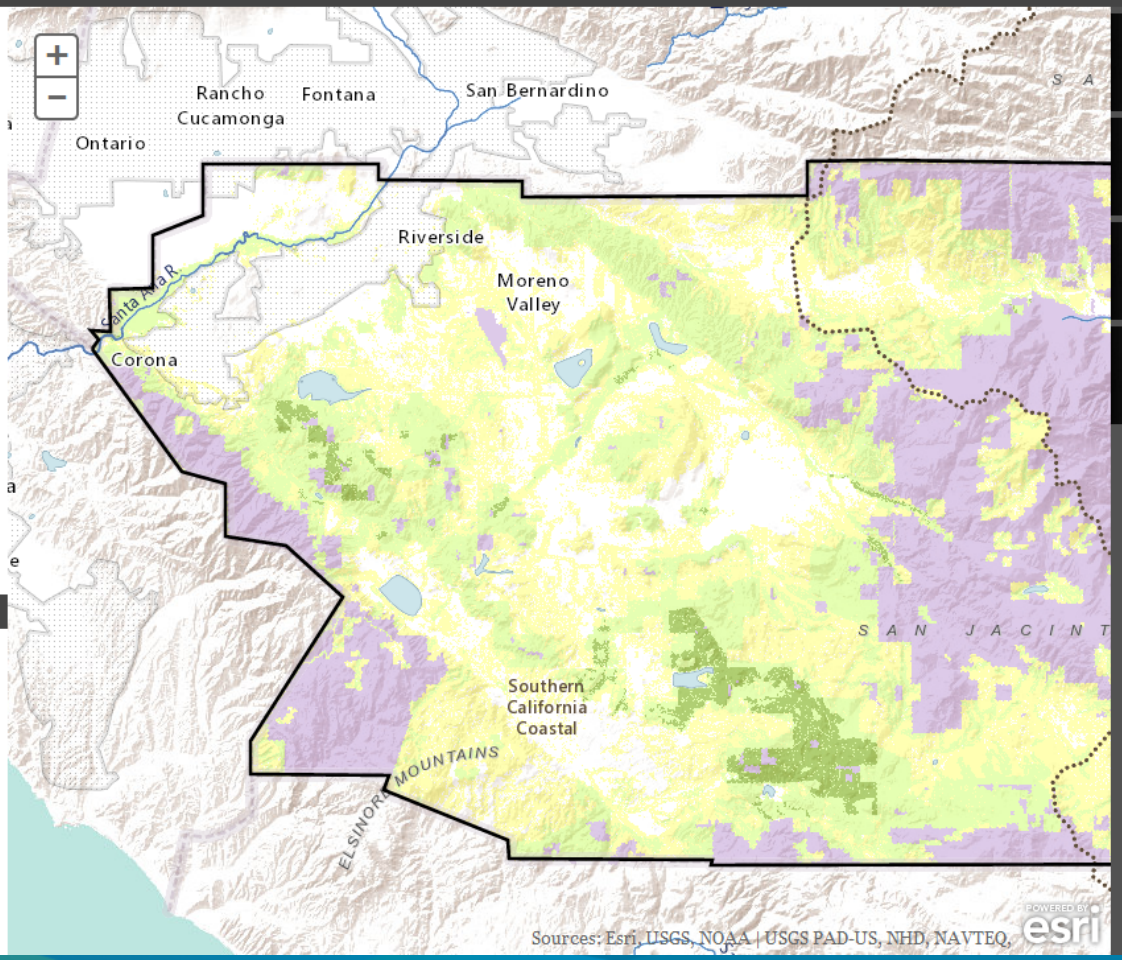
Biodiversity and Currently Protected Lands

- 6 - 33 Low
- 33 - 42
- 42 - 58
- 58 - 76 High

Numbers represent model scores.

Comparison View On | Off

- Protected



1 2 3 4

Preserving Biodiversity in Riverside and Ventura Counties

A story map

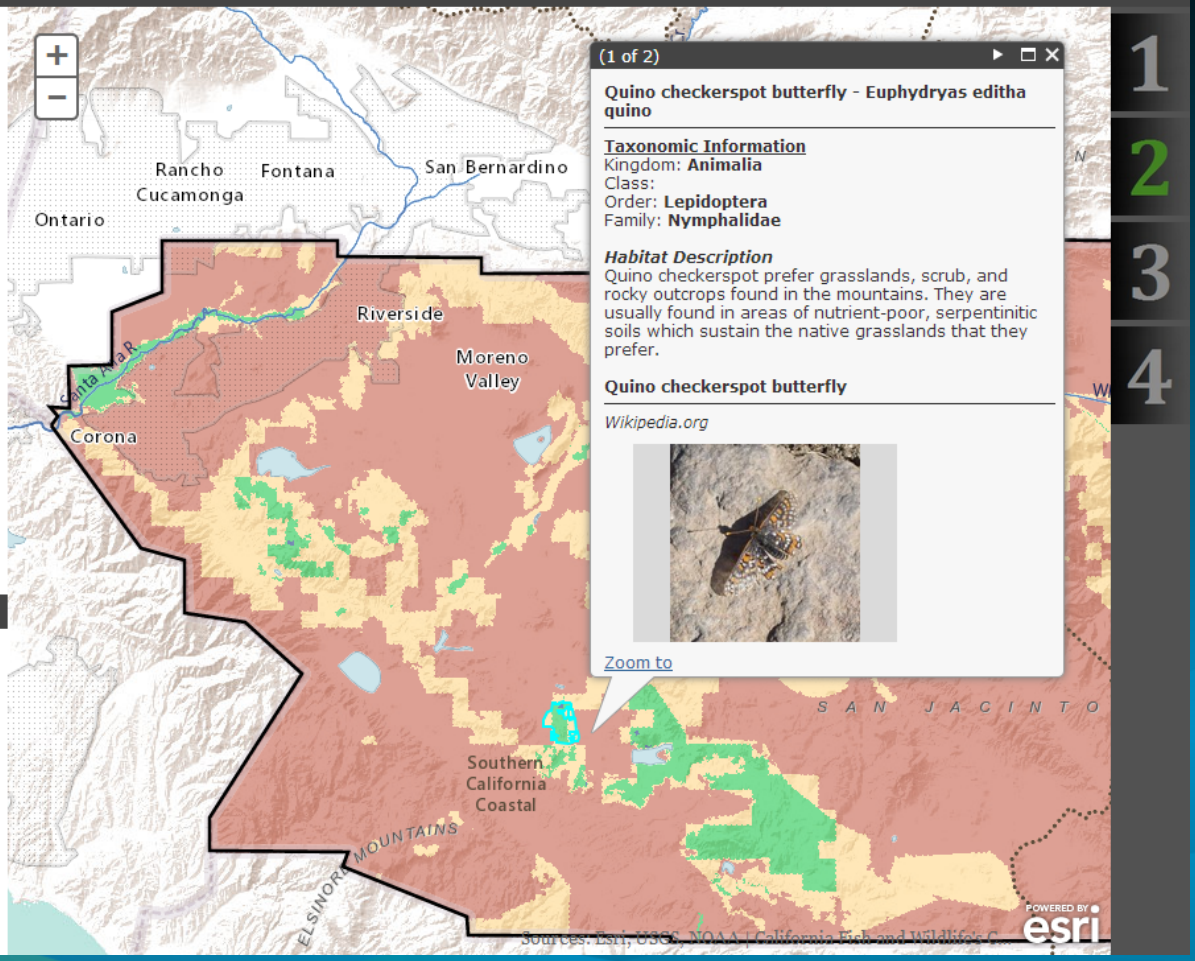
Population Growth and Development will happen, where it happens is up to us to plan wisely. Preserving biodiversity has a direct and positive effect on the protection of water resources, soil formation and protection, pollution breakdown and absorption and the stability of climate.

2

Federally Threatened or Endangered Species

These species have been identified under the Endangered Species Act of 1973. to be the most vital to protect and recover. When such species disappear, biodiversity is diminished.

Pop-up: Click wherever the species count is 1 or more to learn which species is protected in this area and about its habitat.



1 2 3 4

LEGEND

Biodiversity and Currently Protected Lands

- 6 - 33 Low
- 33 - 42
- 42 - 58
- 58 - 76 High

Numbers represent model scores.

Count of Threatened or Endangered Species

- None - 0
- 1 = 10
- 2 = 30
- 3 = 30

Species Count and Model Score are shown.

Comparison View On | Off

Protected

Preserving Biodiversity in Riverside and Ventura Counties

A story map

Population Growth and Development will happen, where it happens is up to us to plan wisely. Preserving biodiversity has a direct and positive effect on the protection of water resources, soil formation and protection, pollution breakdown and absorption and the stability of climate.

3

California Species of Special Concern

These species have been separtely identified by the State of California's Fish and Wildlife Service as being of special concern.

Pop-up: Click to see the inventory of species with habitat in that location.

This data came from the California Wildlife Habitat Relationships (CWHR) System. Specifically species that had significant documentation or high levels of concern were included. Each species was assigned a statistical weighting based on the level of concern.

LEGEND

Biodiversity and Currently Protected Lands

- 6 - 33 Low
- 33 - 42
- 42 - 58
- 58 - 76 High

Numbers represent model scores.

California Species of Special Concern

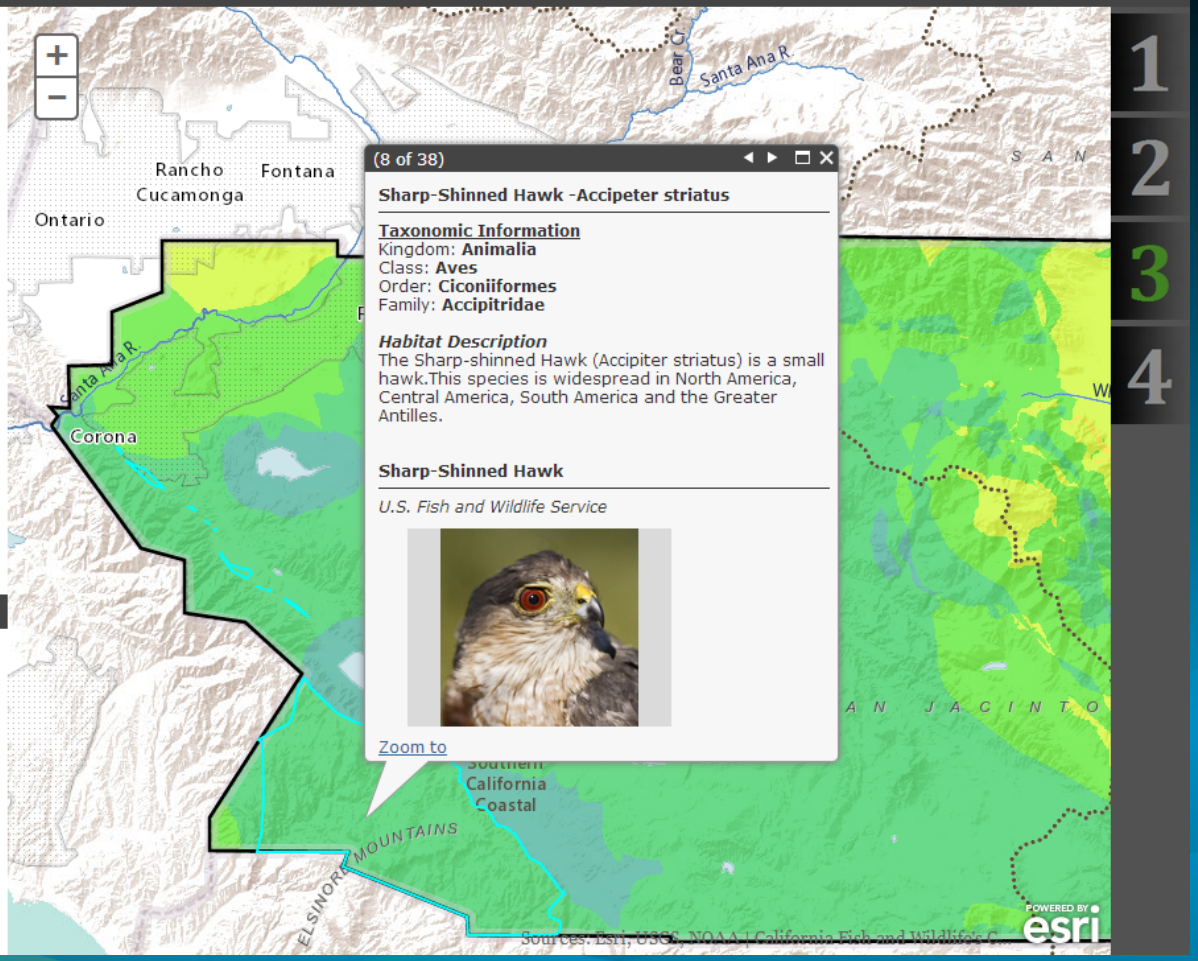
- 2
- 4
- 6
- 8
- 10
- 12
- 14
- 16
- 18
- 20

The count of species ranged from 1 to 48, though the model is weighted by importance

Numbers represent model scores.

Comparison View On / Off

Protected



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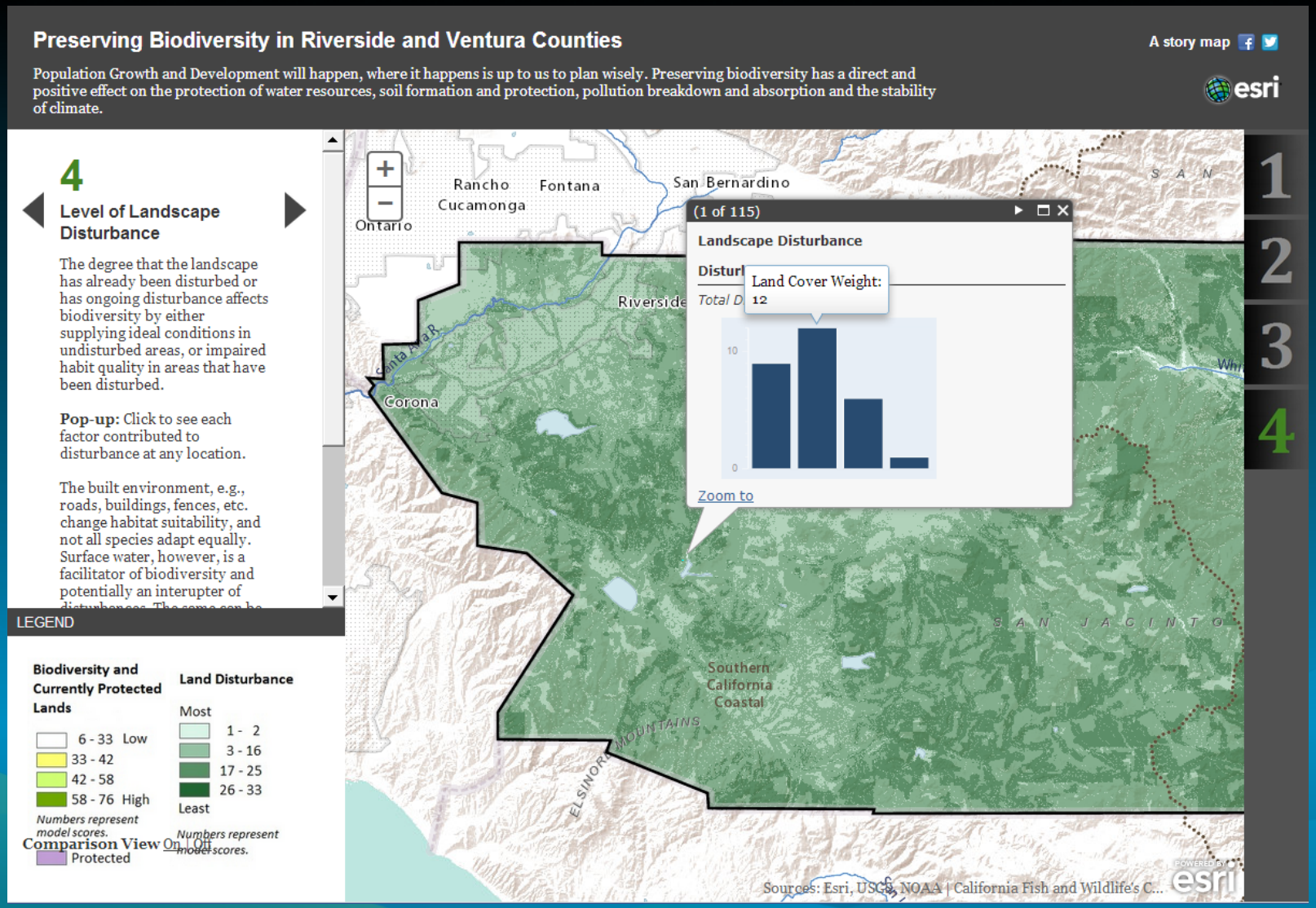
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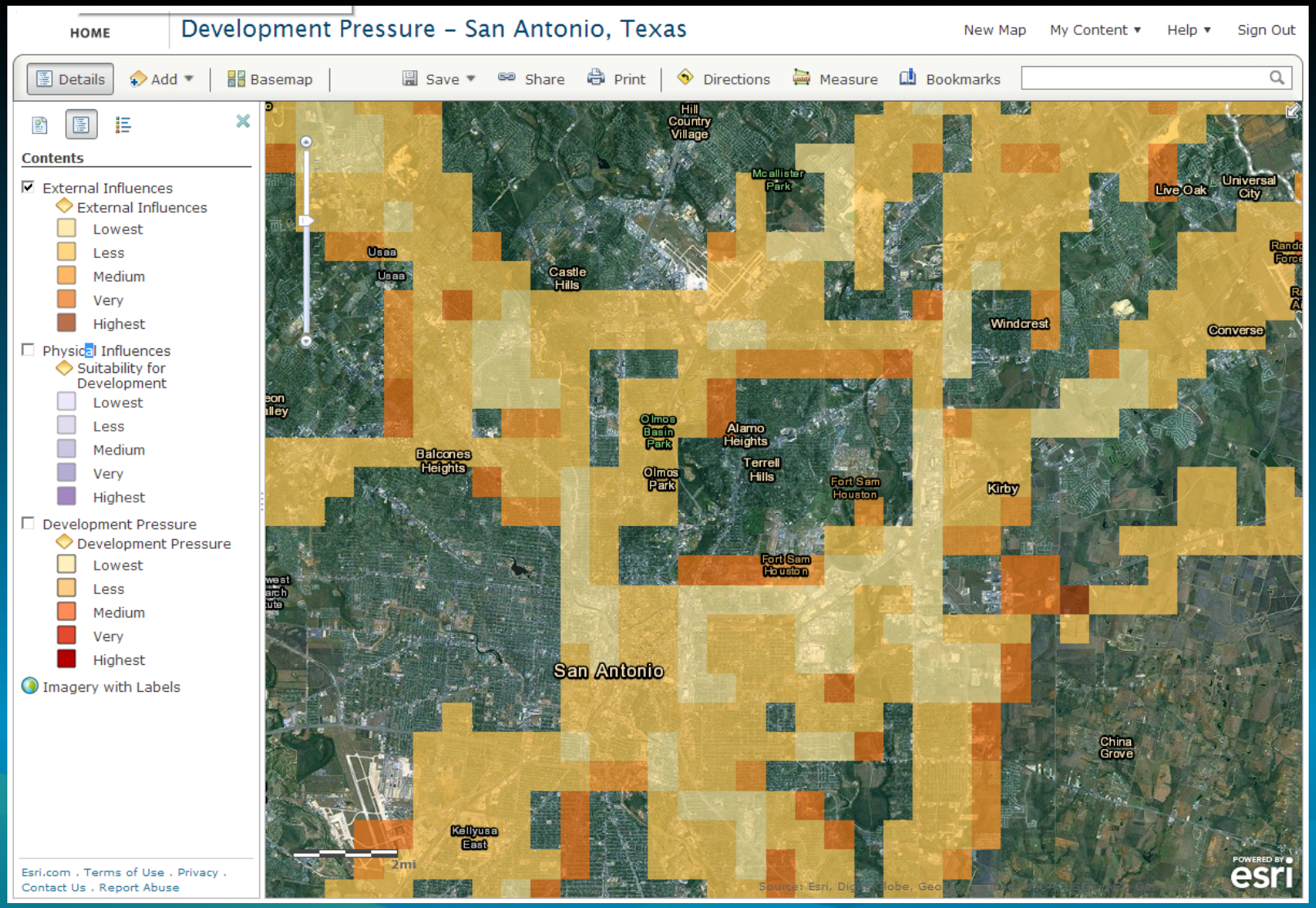
esri
4
Level of Landscape Disturbance
The degree that the landscape has already been disturbed or has ongoing disturbance affects biodiversity by either supplying ideal conditions in undisturbed areas, or impaired habit quality in areas that have been disturbed.
Pop-up: Click to see each factor contributed to disturbance at any location.
The built environment, e.g., roads, buildings, fences, etc. change habitat suitability, and not all species adapt equally. Surface water, however, is a facilitator of biodiversity and potentially an interupter of
LEGEND
Biodiversity and Currently Protected Lands
6 - 33 Low
33 - 42
42 - 58
58 - 76 High
Numbers represent model scores.
Land Disturbance
Most
1 - 2
3 - 16
17 - 25
26 - 33
Least
Numbers represent model scores.
Comparison View On | Off
Protected
Ontario
Rancho Cucamonga
Fontana
San Bernardino
Riverside
Corona
Santa Ana R.
S A N J A C I N T O
Southern California Coastal
SANTA ANA MOUNTAINS
(1 of 115)
Landscape Disturbance
Disturl
Total D
Land Cover Weight:
12
10
0
Zoom to
Sources: Esri, USGS, NOAA | California Fish and Wildlife's C...
1
2
3
4


HOME
Development Pressure – San Antonio, Texas
New Map
My Content
Help
Sign Out
Details
Add
Basemap
Save
Share
Print
Directions
Measure
Bookmarks
Contents
External Influences
External Influences
Lowest
Less
Medium
Very
Highest
Physical Influences
Suitability for Development
Lowest
Less
Medium
Very
Highest
Development Pressure
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Lowest
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Highest
Imagery with Labels
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Hill Country Village
Mcallister Park
Live Oak
Universal City
Usaa
Castle Hills
Windcrest
Converse
Olmos Basin Park
Alamo Heights
Balcones Heights
Terrell Hills
Olmos Park
Fort Sam Houston
Kirby
San Antonio
China Grove
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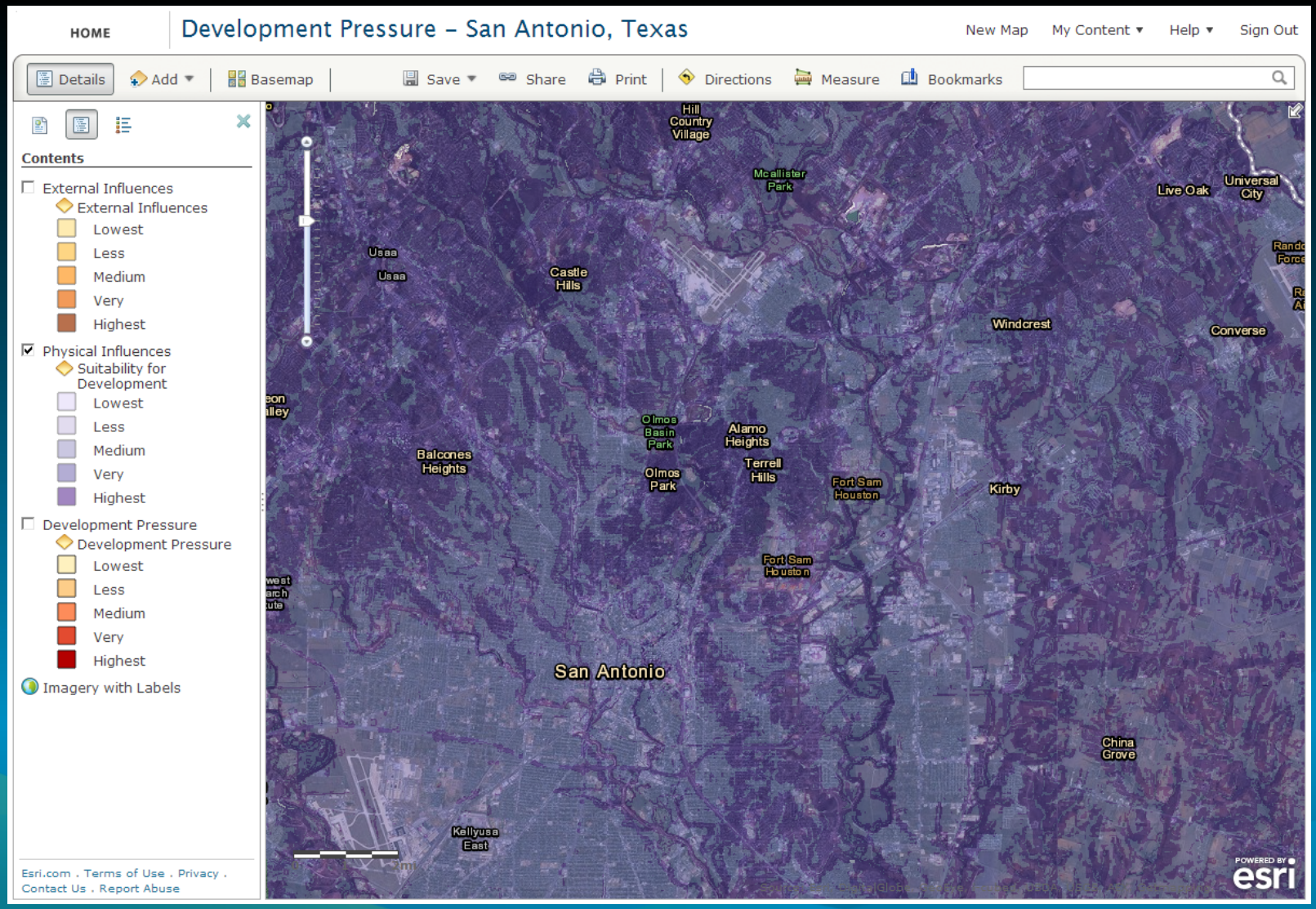
POWERED BY esri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Usaa
Usaa
Castle Hills
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Converse
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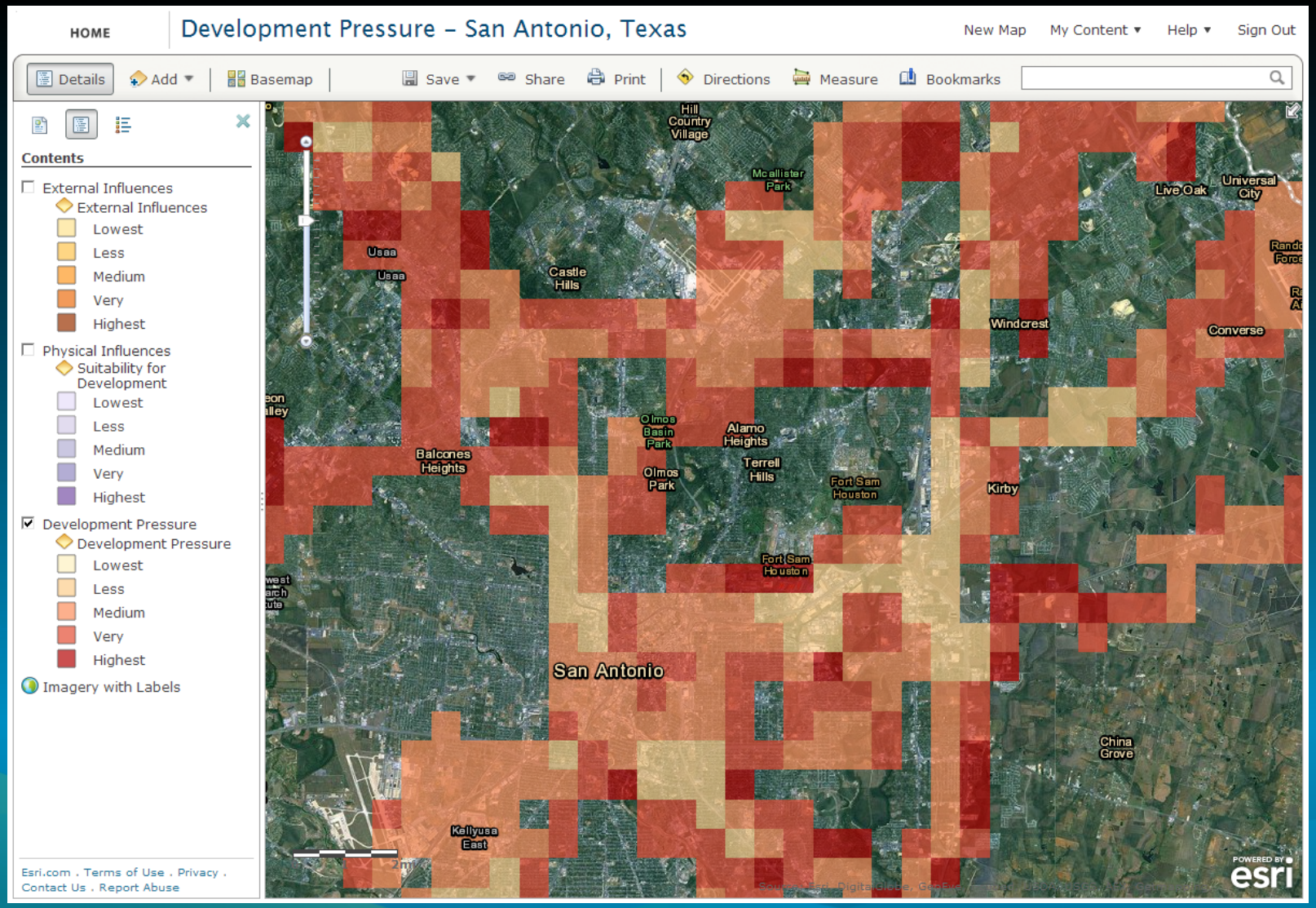
Balcones Heights
Olmos Park
Terrell Hills
Fort Sam Houston
Kirby
Fort Sam Houston
San Antonio
China Grove
Kellyusa East
POWERED BY esri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Olmos Park
Fort Sam Houston
Kirby
San Antonio
China Grove
Kellyusa East
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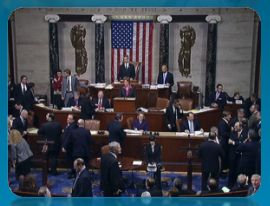
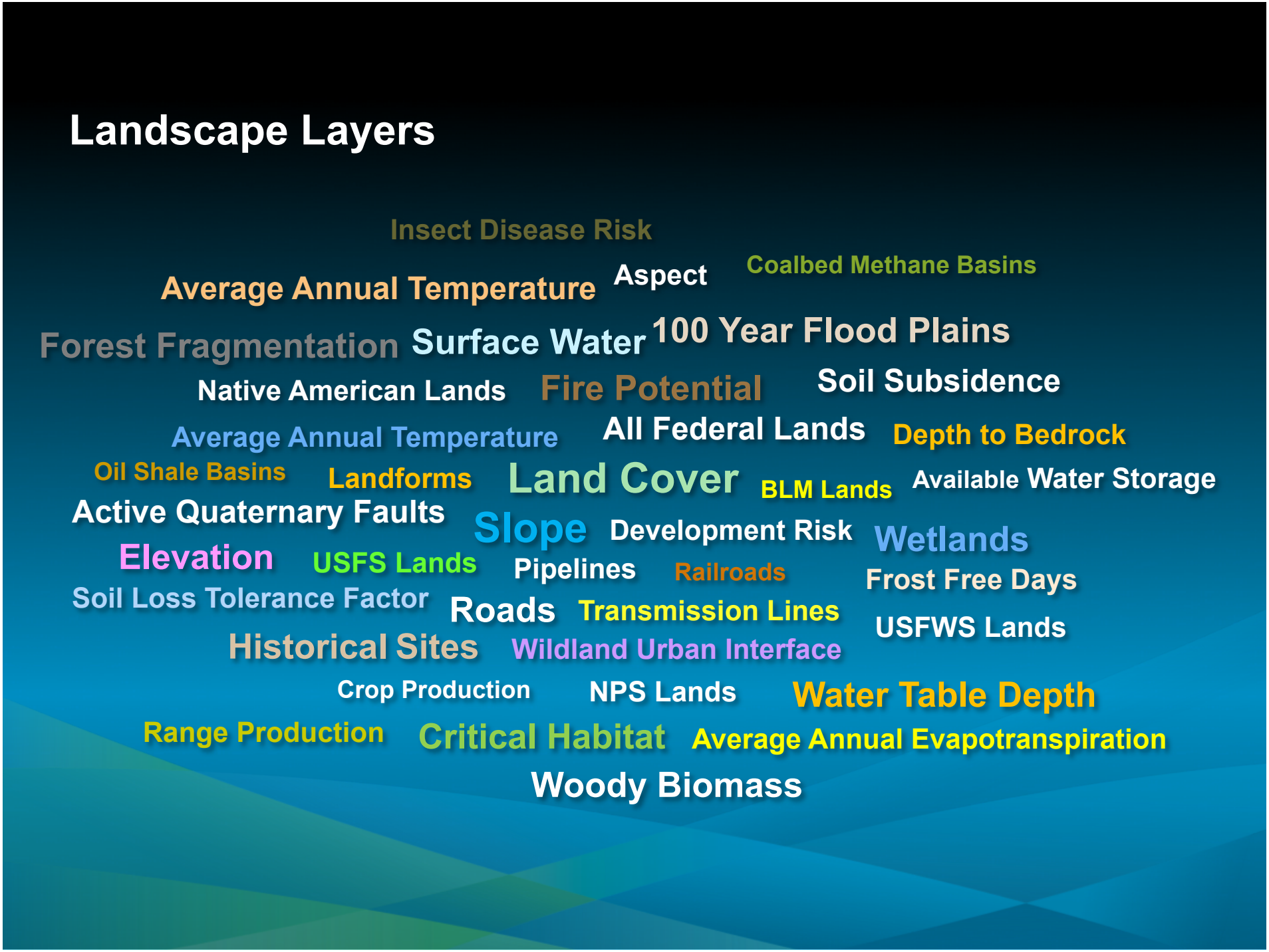
Who Benefits?



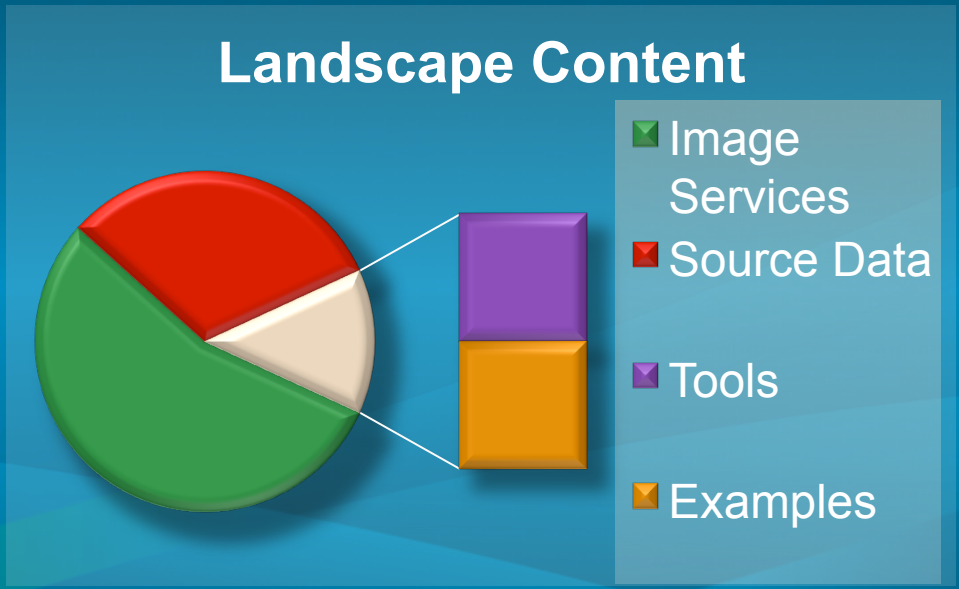
- **Scientists and Technicians**
  - Analyze, Author, & Publish from ArcGIS Desktop
  - Use with local data to enhance analysis
- **Planners and Managers**
  - Design Project Plans
  - Determine work priorities
  - Learn with services and resources on AGOL
- **Policy Makers and Administrators**
  - Summary reports using location analytics
  - Using and sharing web maps
- **Interested Public, Teachers and Students**
  - Explore via browsers
  - Create awareness of issues and opportunities

Landscape Layers



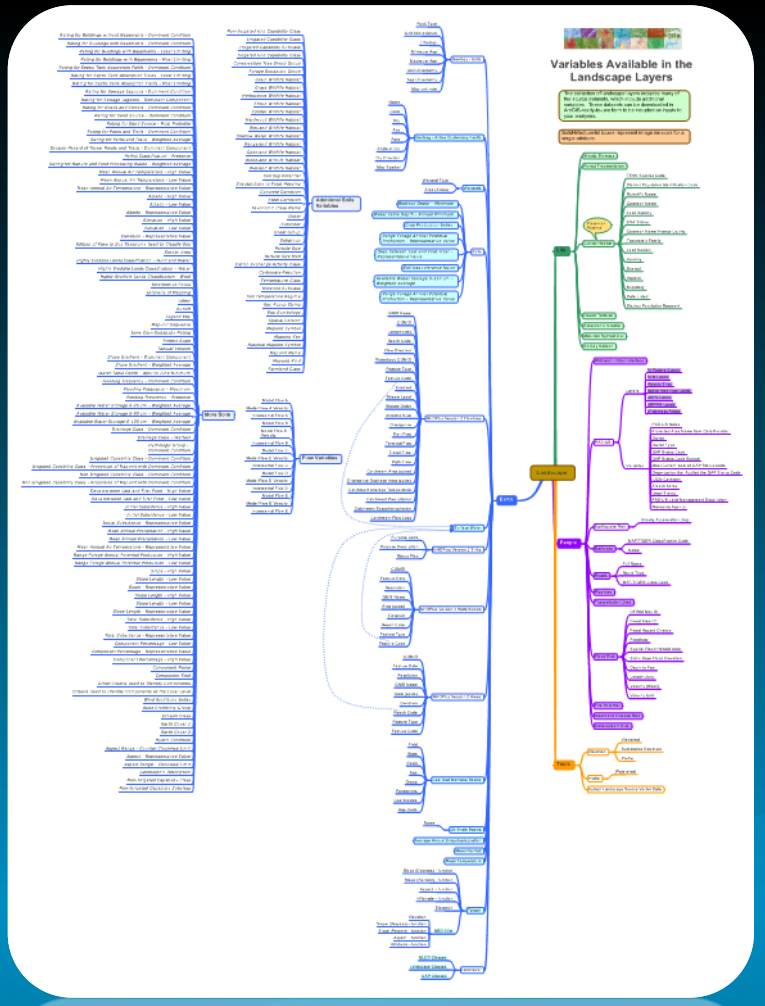
Landscape deliverables…

- Landscape layers (60+ services with ~300 attributes)
  - Image Services that are analysis-ready
  - Map & Image services of Source data
  - Geoprocessing Service to extract seamless study area footprints of source vector data.
  - Use Copy Raster Geoprocessing tool to do the same with Image services.
- Story Maps that deliver:
  - Analysis concepts
  - Models
  - Tutorials



~300 Attributes

- See the poster
- Solid items represent image services
- Others represent attributes in source services



~300

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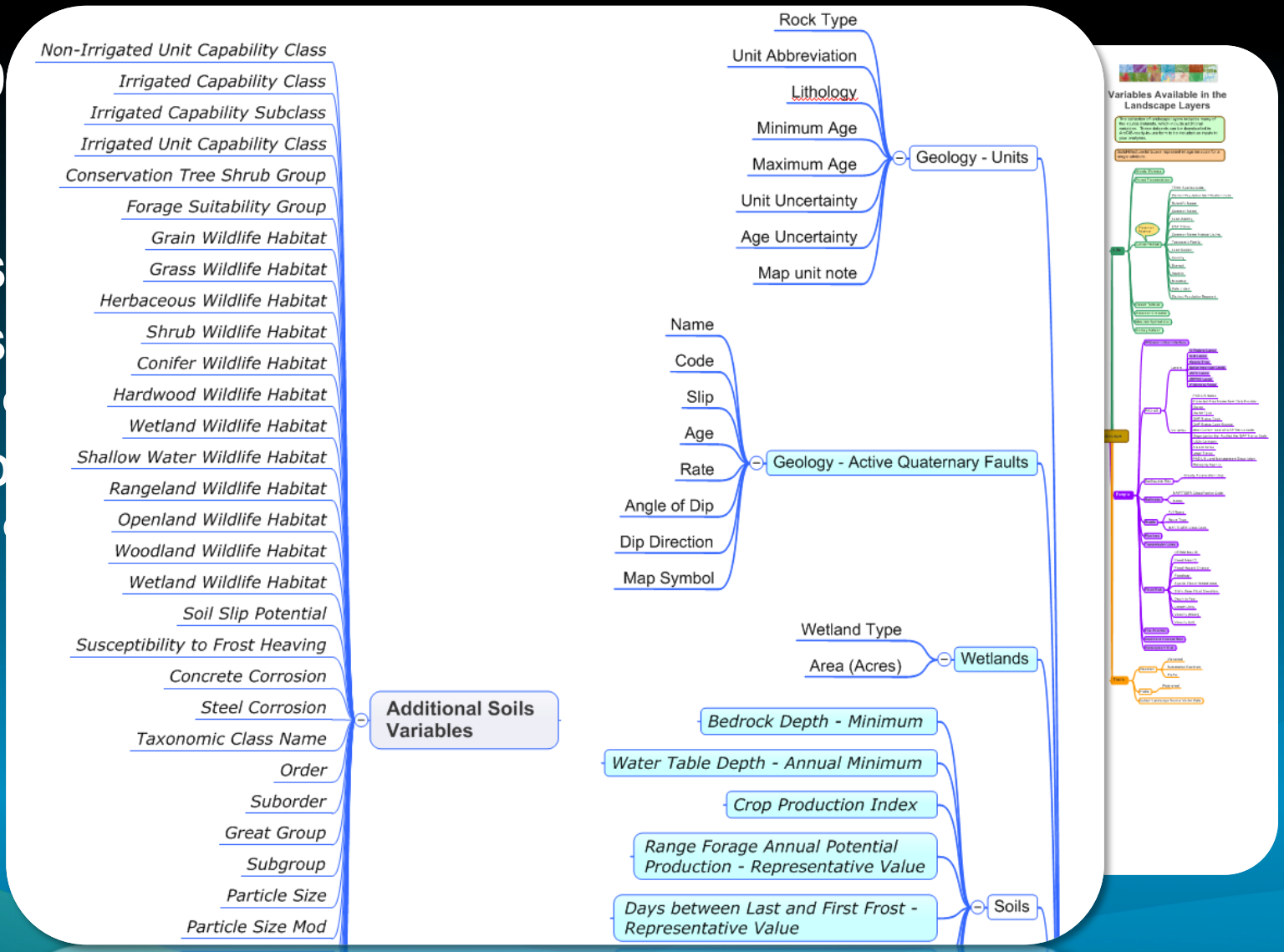
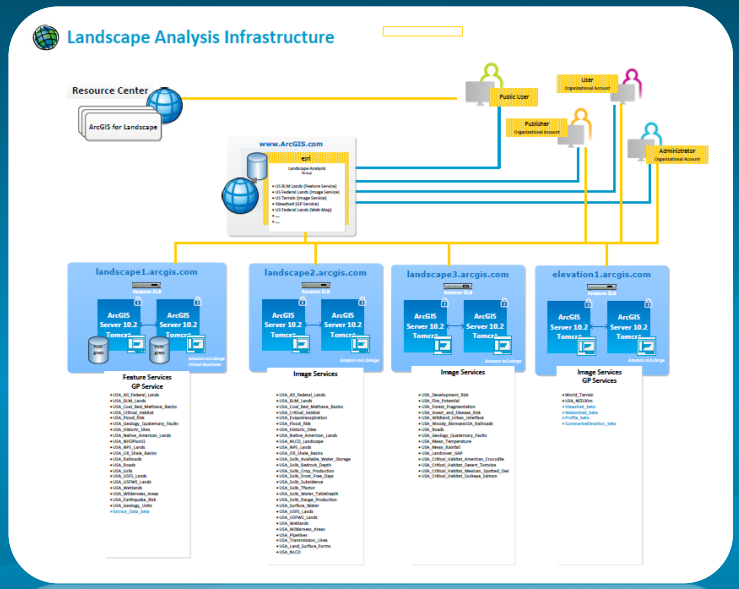

Non-Irrigated Unit Capability Class
Irrigated Capability Class
Irrigated Capability Subclass
Irrigated Unit Capability Class
Conservation Tree Shrub Group
Forage Suitability Group
Grain Wildlife Habitat
Grass Wildlife Habitat
Herbaceous Wildlife Habitat
Shrub Wildlife Habitat
Conifer Wildlife Habitat
Hardwood Wildlife Habitat
Wetland Wildlife Habitat
Shallow Water Wildlife Habitat
Rangeland Wildlife Habitat
Openland Wildlife Habitat
Woodland Wildlife Habitat
Wetland Wildlife Habitat
Soil Slip Potential
Susceptibility to Frost Heaving
Concrete Corrosion
Steel Corrosion
Taxonomic Class Name
Order
Suborder
Great Group
Subgroup
Particle Size
Particle Size Mod
Additional Soils Variables
Rock Type
Unit Abbreviation
Lithology
Minimum Age
Maximum Age
Unit Uncertainty
Age Uncertainty
Map unit note
Geology - Units
Name
Code
Slip
Age
Rate
Angle of Dip
Dip Direction
Map Symbol
Geology - Active Quaternary Faults
Wetland Type
Area (Acres)
Wetlands
Bedrock Depth - Minimum
Water Table Depth - Annual Minimum
Crop Production Index
Range Forage Annual Potential Production - Representative Value
Days between Last and First Frost - Representative Value
Soils

Variables Available in the Landscape Layers

Status

- **Planned public beta in late June**
  - 45 Image services, including elevation services with server side functions for slope aspect, and hillshade.
  - 20 Dynamic map services
  - Geoprocessing service to extract source vector data
  - Geoprocessing services for Elevation
    - Viewshed
    - Watershed delineation
    - Profile
    - Elevation Summary Statistics
  - Landscape for ArcGIS Resource Center
- **Planned general release in late Q3**



What is different?

- The ArcGIS Platform
- ArcGIS Online *IS THE* GIS
  - Content is shared among communities
  - Using our community's shared content

- Easier
- More Powerful
- and Everywhere

Discussion Points

- Could you use this?
  - If not, why?
- Could your customers use this?
  - If not why?
  - If so, what else would help
- ArcGIS Online as a central user experience