OSFM OrCRAFT

Oregon Community Risk Assessment Fire Tools

OrCRAFT Overview

This tool was developed, according to NFPA 1300 standards, to provide emergency planners with an easy-to-use resource to help identify, evaluate, and mitigate fire risks in the built environment. By leveraging data and advanced analytics, OrCRAFT provides valuable insights into potential fire hazards in local communities throughout Oregon.

The primary goals of the OrCRAFT tools are to:

- Reduce fire incidents.
- Protect lives and property.
- Enable proactive planning and prevention.
- Contribute to community resiliency.

Quick Facts:

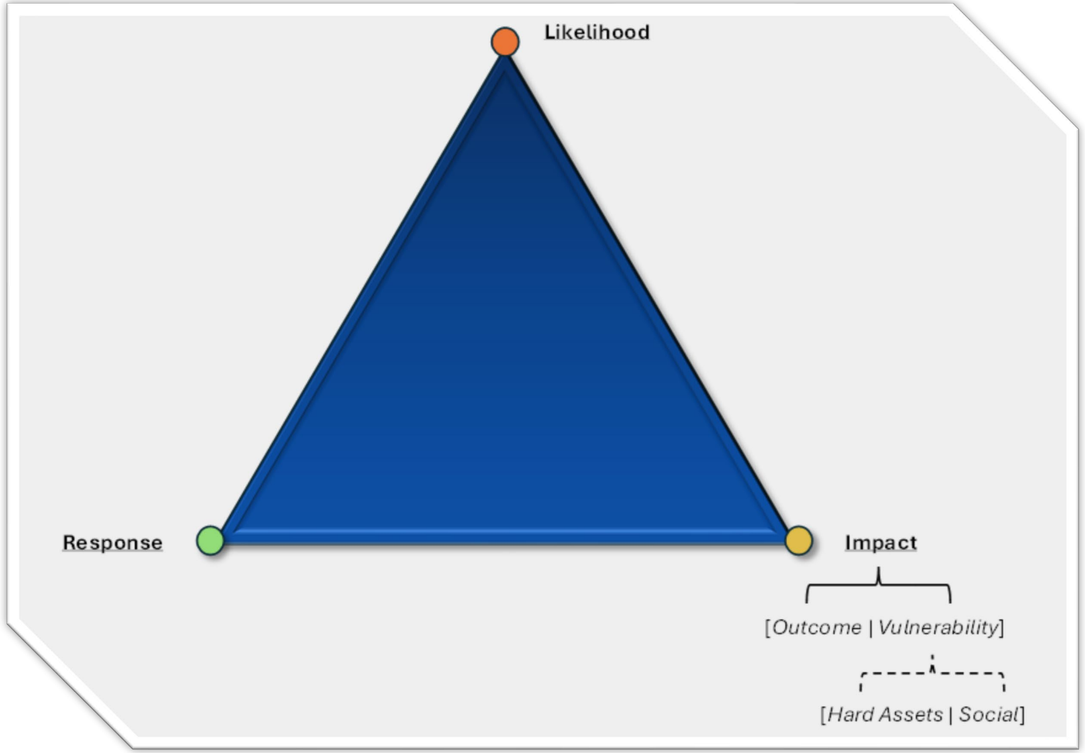
- Over 43,000 building fire incidents examined.
- Over 30 variables included.
- Data from different data sources used:
  - NFIRS/NERRIS
  - US Census data
  - US ACS data
  - US CDC SVI data
  - US HIFLD data
  - OSU SVI data
  - Oregon CR2K data
  - Oregon DOGAMI

OrCRAFT Overview

- Fire incidents and GIS data were used to build models to help determine the predictive probability (likelihood) of building fires occurring.
- The impact of the fires is calculated by OrCRAFT based on the vulnerability and community assets selected, as well as historic and predictive fire casualty data.
- Fire incident location data, GIS information (fire stations), and driving distance is used to determine response capabilities.
- OrCRAFT calculates the building fire risk by summing the selected *vulnerabilities*, multiplied by the empirical building fire likelihood (and optional vegetation burn probability).

$$\boldsymbol{Risk = \sum_{k=1}^{n} (BFLH + WBP) * RRV_k * W_k}$$

Figure 1: OrCRAFT Components Model



OrCRAFT

Fire Risk Likelihood

1. **What is the general likelihood of a fire occurring in your community? This includes “regular” structure fires and structure fires started by wildfire.**

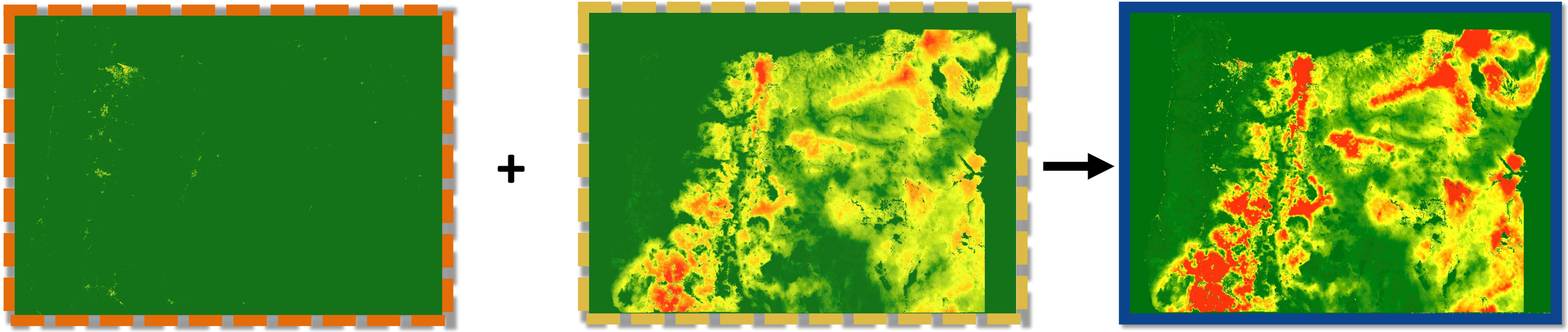
2. What vulnerable assets are in your community, how susceptible are they, and how valuable are they to your community?

3. Who is the most vulnerable in your community and where does this population live?

OrCRAFT
Spatial Evaluation

Density of recorded building fires

Vegetation burn probability (optional selection)



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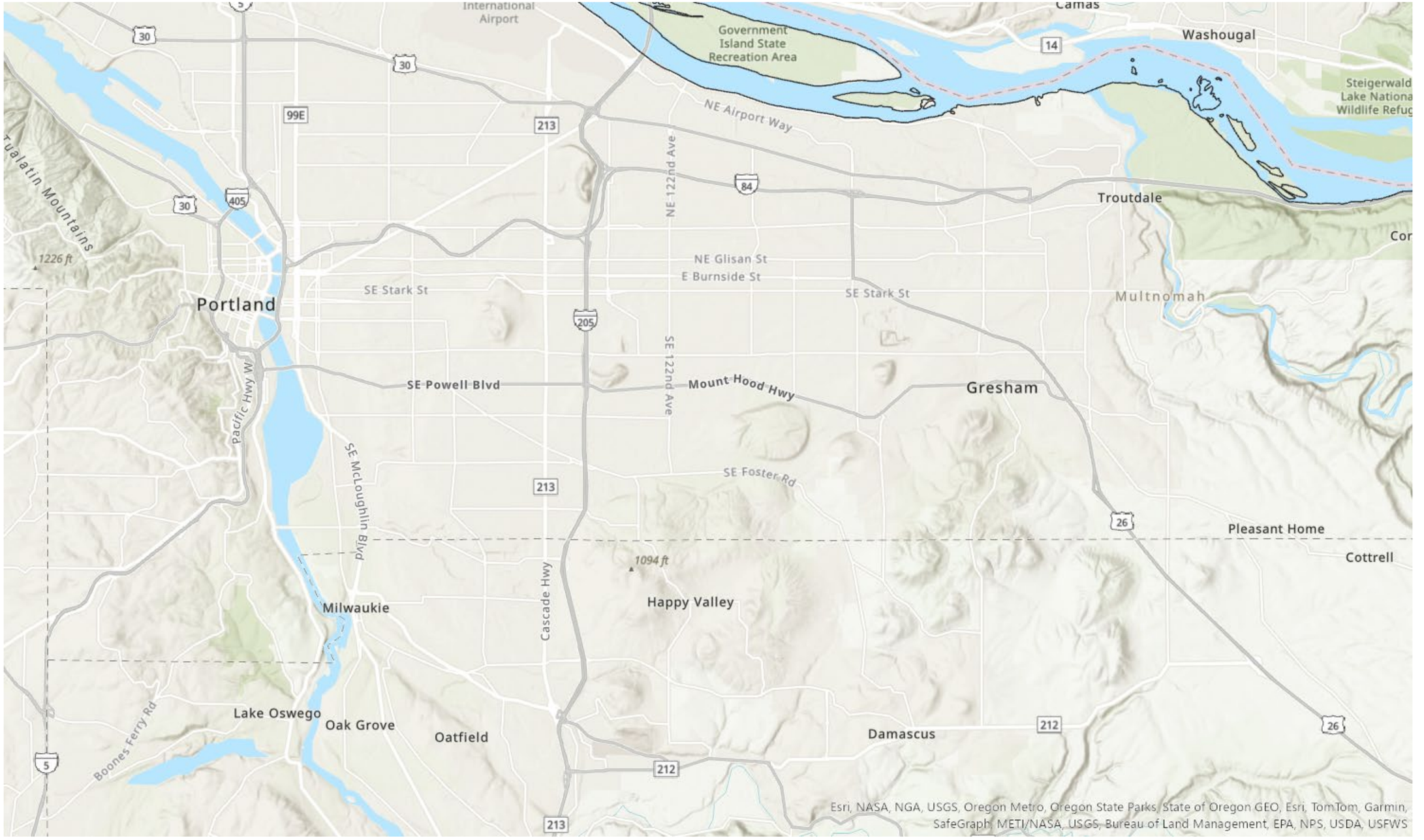
Government Island State Recreation Area
Camas
Washougal
Steigerwald Lake National Wildlife Refuge
NE Airport Way
NE 122nd Ave
Troutdale
NE Glisan St
E Burnside St
SE Stark St
Portland
Multnomah
SE Powell Blvd
Mount Hood Hwy
Gresham
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Boones Ferry Rd
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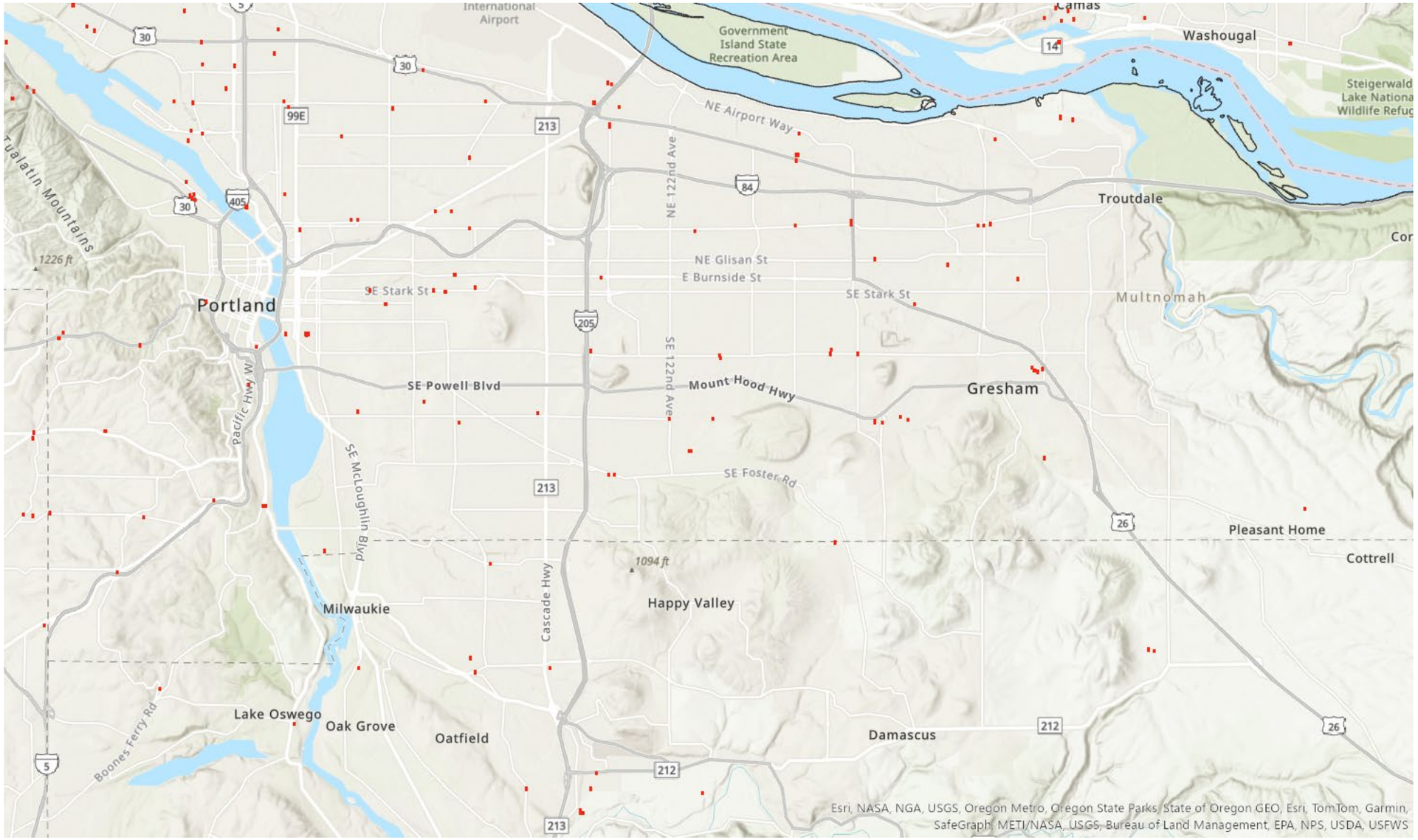
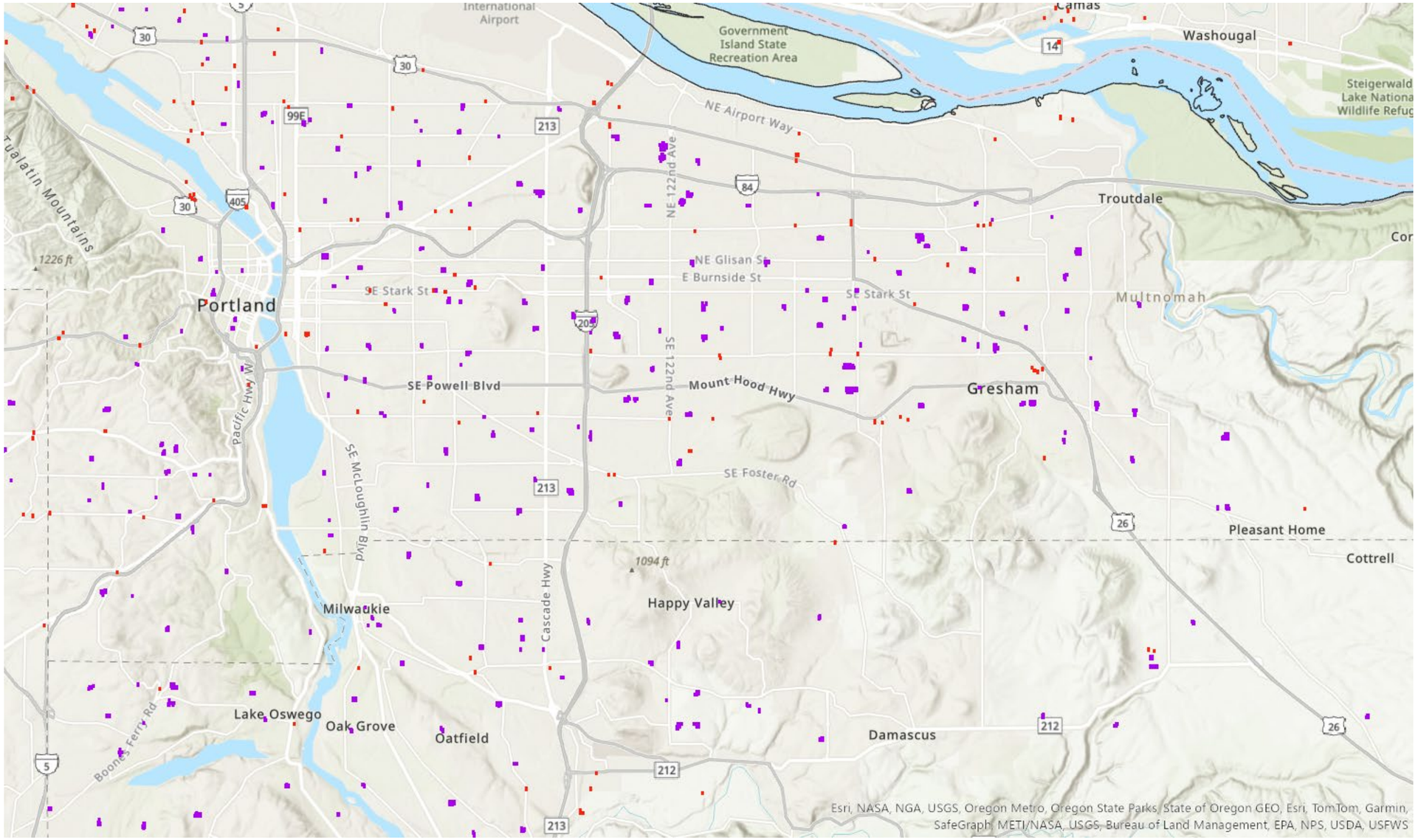
Tualatin Mountains
Esri, NASA, NGA, USGS, Oregon Metro, Oregon State Parks, State of Oregon GEO, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Power Substations



Schools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Oak Grove
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Damascus
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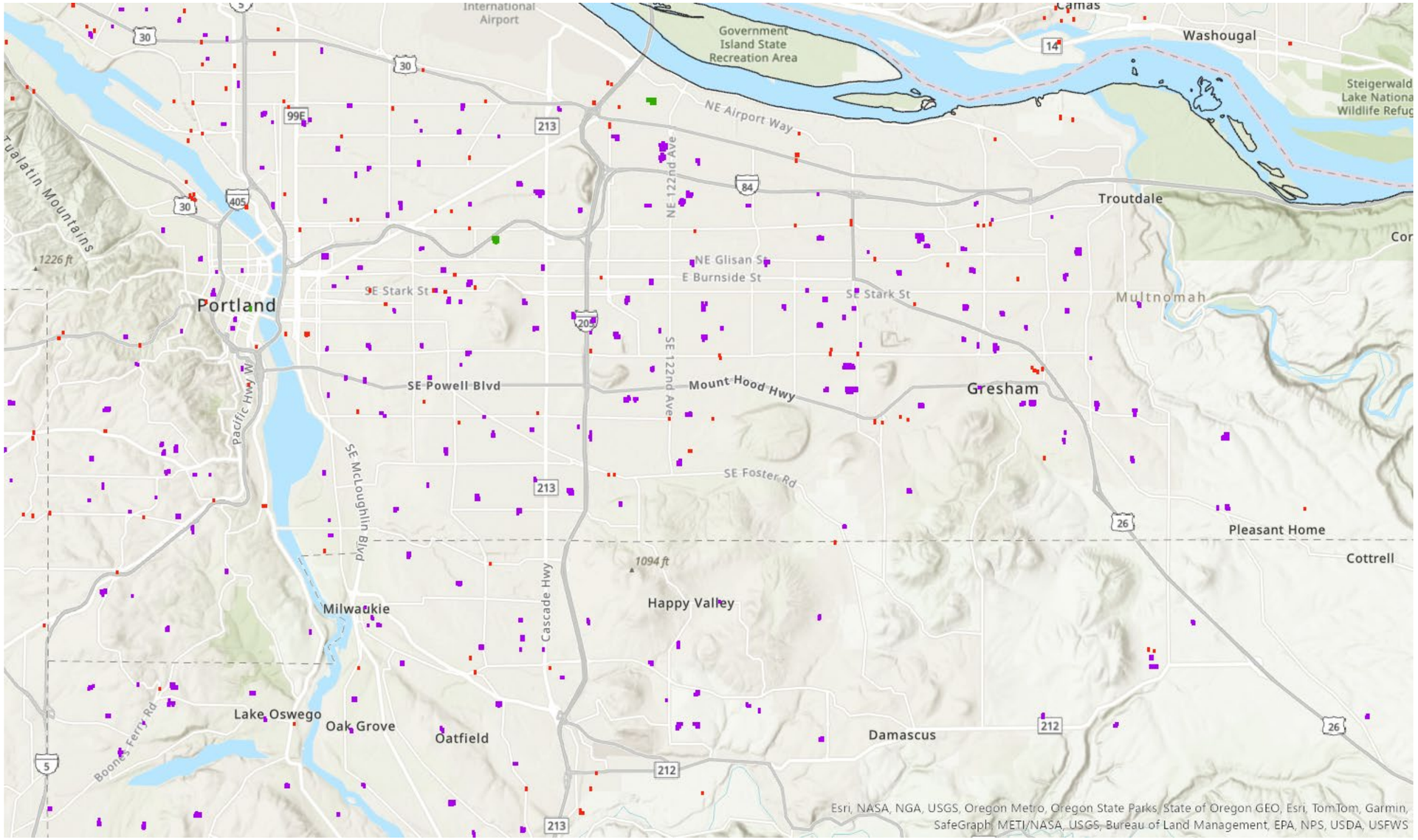
Esri, NASA, NGA, USGS, Oregon Metro, Oregon State Parks, State of Oregon GEO, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Prisons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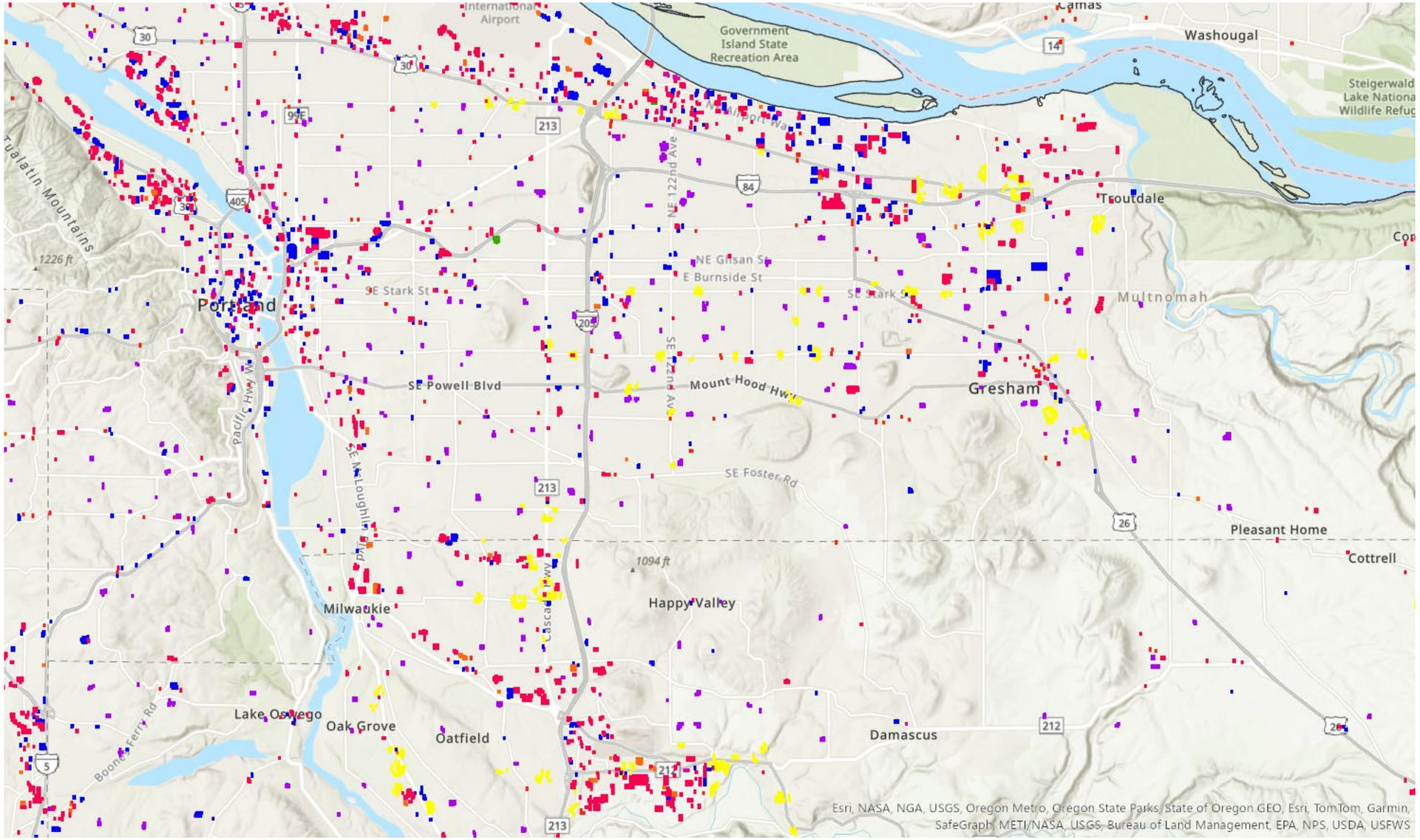
HAZMAT Storage Facilities



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3. **Who is the most vulnerable in your community and where does this population live?**

OrCRAFT
Components & Factors

A Fire Related

- Total number of building fires
- Number of building fires per building
- Number of building fires per person
- Number of wildfires per person or per building

B Structural

- Building density
- Age of buildings
- Spatial building fire incident density
- Facilities at risk (schools, hospitals,…)
- Facilities that increase the risk (HAZMAT)

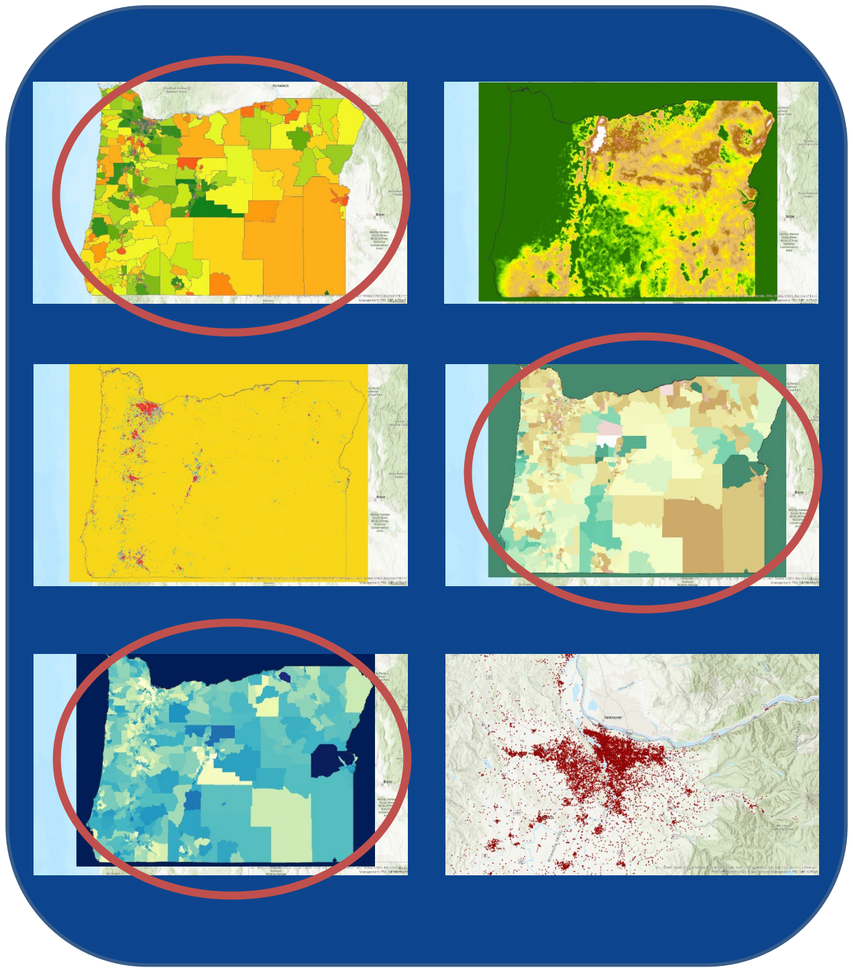
C Socio-Economic

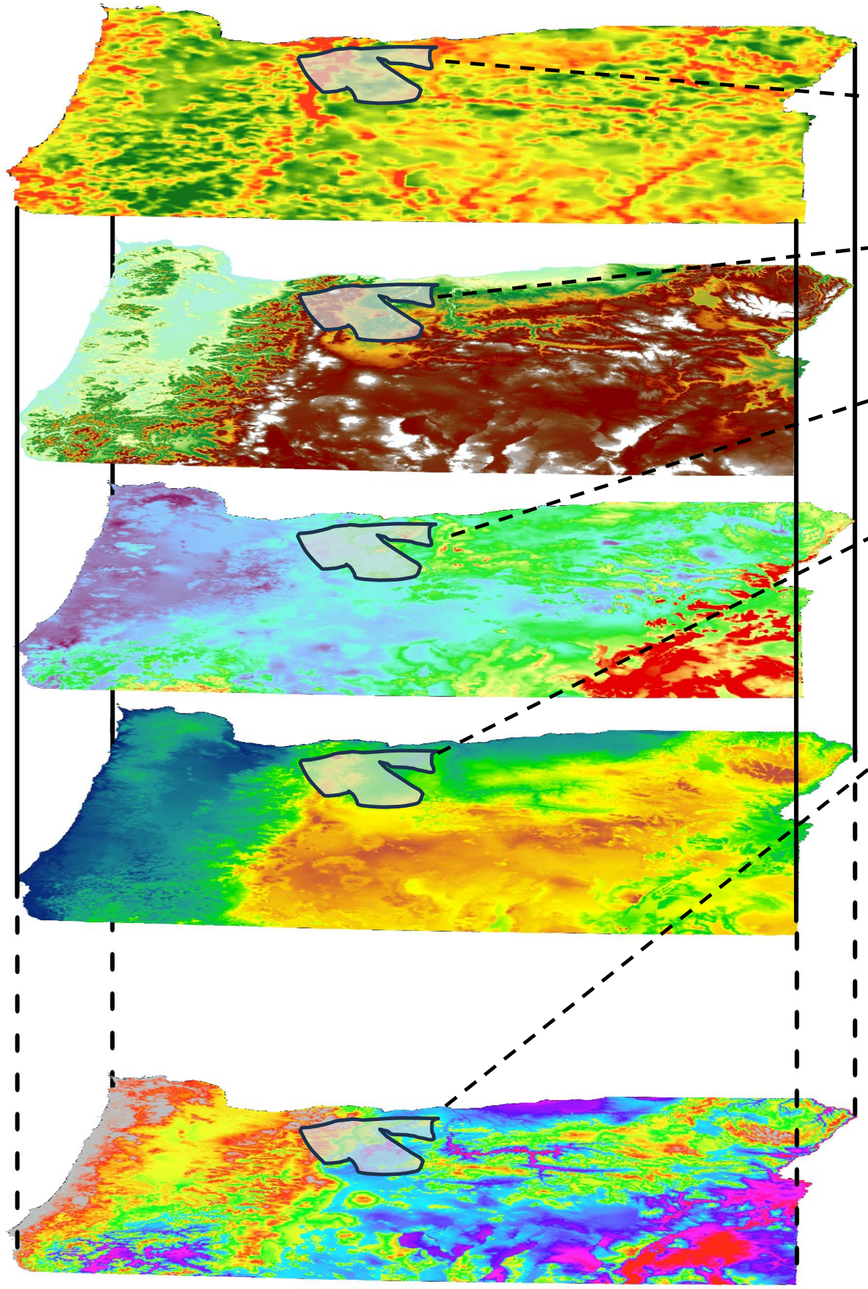
- Percent of population living in poverty
- Per Capita Income
- Percent unemployed
- Percent no high school diploma
- Percent single parent
- Percent being part of a minority
- Limited English

SVI

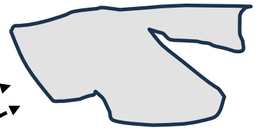
D People/Population

- Number of households
- Number of housing units
- Total population
- Population density
- Households with minors
- Number of households with disabilities





Cutout all layers' data for AOI



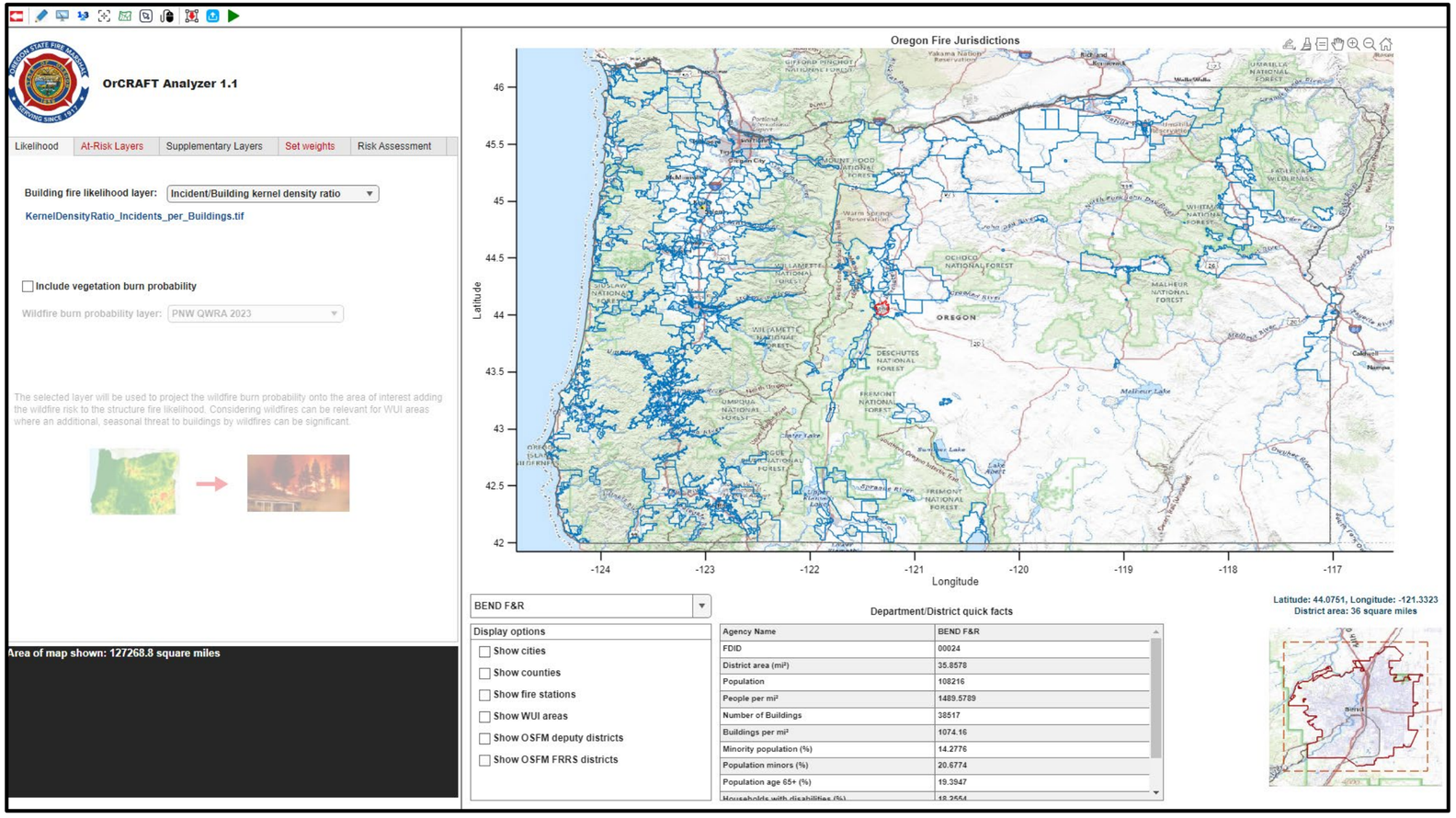
$$OFR = \sum_{k=1}^{n} (BFLH + WBP) * RRV_k * W_k$$

Risk map generator

Report writer

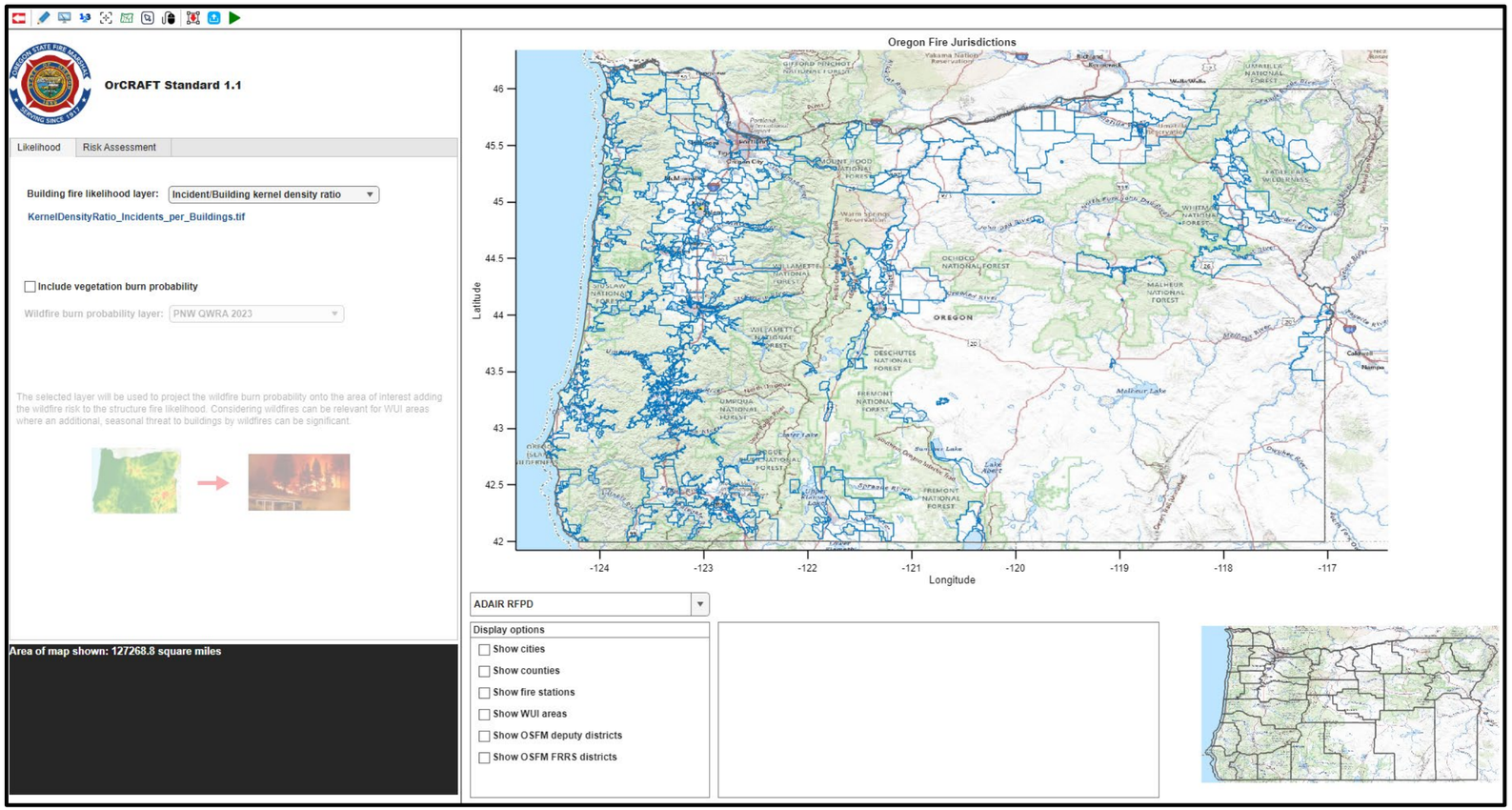
Live Demonstration

OrCRAFT Analyzer
Version 1.1



Risk attribute layers	Spatial resolution of data
Number of households	Census block group
Percentage households with disabilities*	Census block group
Number of housing units	Census block group
Age of buildings	Census block group (or individual houses where available)
Per capita income	Census block group
Percentage population in poverty	Census block group
Percentage population minors*	Census block group
Percentage population living in mobile homes	Census block group
Percentage population with no high school diploma	Census block group
Percentage population seniors*	Census block group
Percentage population unemployed	Census block group
Population density	Census block group
Prisons*	30 m x 30 m
Hazardous material storage locations*	30 m x 30 m
Nursing homes*	30 m x 30 m
Percentage minority population*	Census block group
Power substations*	30 m x 30 m
Hospitals*	30 m x 30 m
Mobile home parks*	30 m x 30 m
Schools*	30 m x 30 m
SVI* (OSU or CDC)	Census block group or tract
Distance to nearest hospital	30 m x 30 m
Driving distance to nearest fire station	30 m x 30 m
Probability of serious injury or death	30 m x 30 m
Percentage population single parent	Census block group
Percentage multiunit housing	Census block group
Percentage of population with limited English	Census block group
Percentage of crowded households	Census block group
Home value	Census block group
Building density	30 m x 30 m
Airports	30 m x 30 m
Communications systems	30 m x 30 m

OrCRAFT Standard
Version 1.1



Risk attribute layers	Spatial resolution of data
Hospitals	30 m x 30 m
Nursing homes	30 m x 30 m
Mobile home parks	30 m x 30 m
Age of buildings	Individual / block group avg.
Hazmat facilities	30 m x 30 m
Power substations	30 m x 30 m
Prisons	30 m x 30 m
Schools	30 m x 30 m
Population seniors (65+)	Census block group
Population minors (17 and under)	Census block group
Population being part of a minority	Census block group
Driving distance to nearest fire station	30 m x 30 m
Percent of households with disabilities	Census block group
SVI (OSU or CDC)	Census block group or tract
Airports	30 m x 30 m
Communications systems	30 m x 30 m