Department of Commerce

Puget Sound
Mapping Project

Project Description

Project Overview

In partnership with EPA National Estuary Program, Puget Sound Partnership Program, Washington State Department of Ecology

Department of Commerce

Puget Sound Mapping Project

Study Area

Whatcom

San Juan

Skagit

Clallam

Island

Snohomish

Jefferson

Kitsap

King

Mason

Thurston

Pierce
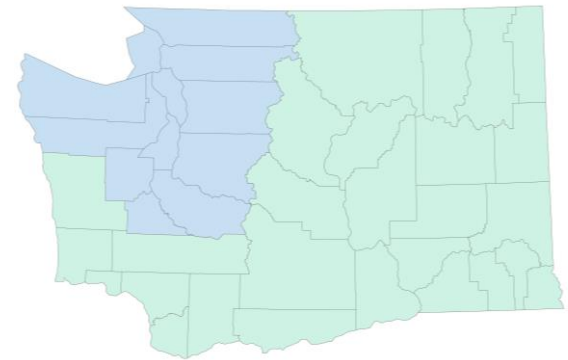
Project Overview - Project Objectives

Produce integrated maps of growth around Puget Sound by tracking zoned (planned) growth vs. actual development

- 12 counties
- 113 cities within the identified counties

Show zoning and land use patterns (2012)

Integrate data on new housing

development (2001-2017)

- OFM small area population estimates (by Census block groups)

Project Overview - Project Description

Normalized zoning and mapping categories across 12 counties, including:

- 15 Master Zoning Categories

- 32 "Nested" Sub Categories

New housing units from 2000-2017

Limits:

- Does not differentiate between detached homes and apartments or mobile homes

- Dots do not represent exact locations, but are general approximations of new development locations

Project Overview - Project Objectives

Show large scale growth patterns within

- Urban growth areas v. rural areas

- Incorporated v. unincorporated areas

- Land use categories

- New housing starts/units from 2000-2017

Project Overview - Trend Analysis

Annual population increase has tripled

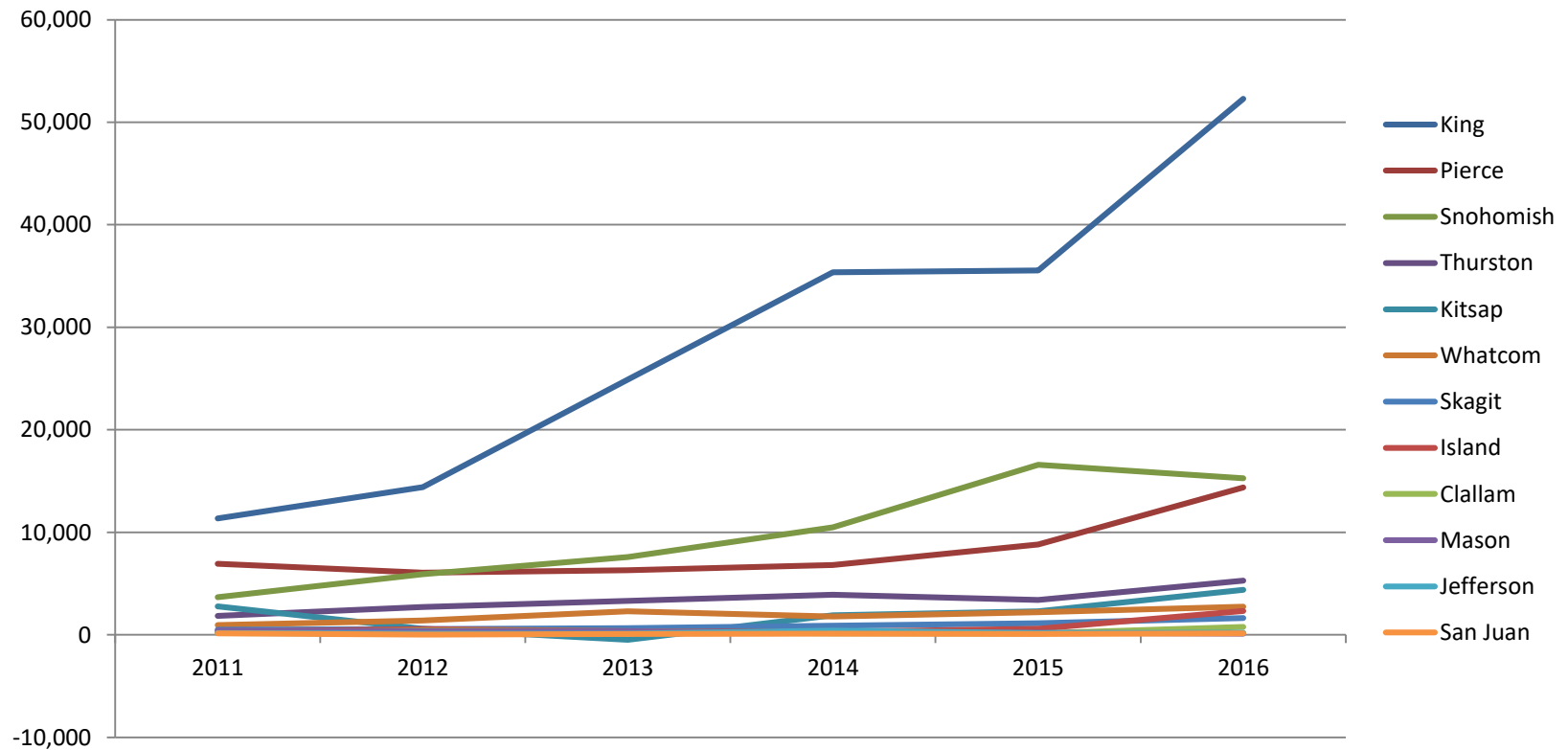- 29,203 new residents from 2010-2011
- 99,540 new residents from 2015-2016

Percentage of growth by county is staying about the same

- 50% in King County
- 13% outside of King, Pierce, Snohomish, Kitsap & Thurston

Percentage of growth in King County located in Seattle is increasing

- 40% between 2010 and 2011
- 57% between 2015 and 2016

Project Overview - Population Growth, 2011-2016

Subcategories Legend
(by Master Category)

Intensive Urban
- Commercial/Office
- Institutional Uses (Hospital, Campus)
- Mixed Use
- Residential (12+ Units/Acre)

Industrial
- Airport/Seaport
- Heavy Industrial
- Light Industrial

Urban Residential
- Low Density Urban Residential (1.1-3 Units/Acre)
- Mixed Use/Planned Neighborhood (3.1-12 Units/Acre)
- Traditional Single Family Residential (3.1-12 Units/Acre)

Rural Residential
- Large Lot Residential (1 unit per 10 acres to 1 unit per 19.9 acres)
- Rural Transition (1 unit per 5 acres to 1 unit per 9.9 acres)
- Urban Edge (1 unit per acre up to 1 unit per 4.9 acres)
- Very Large Lot Residential (1 unit per 20 acres or more)

Agricultural
- Other Active Agricultural
- Primary Agricultural Area

Forest
- National Forest
- Other Forest Lands
- Primary Forest Area

Mineral
- Primary Mineral Area

Recreation and Preservation
- Active Open Space or Recreation
- National Park
- Natural Preservation and Conservation

Other - Military
- Intensively Developed Military
- Undeveloped Military Lands

Other - Tribal
- Tribal Inholding Lands
- Tribal Reservation

Undesignated
- Undesignated

Reference
- Water
- ROW
- ROW or Water

Public
- Public

Edit   View   Favorites   Tools   Help

cGIS ⌄   Generalized_LUse_2012

Modify Map   ⚇ Sigr

Details   ▦ Basemap   ⌨ Share   🖨 Print ⌄   📏 Measure   Find address or place

gend

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_County

neral_Land_Use

Active Open Space and Recreation

Airport/Seaport

Commercial/Office

Heavy Industrial

Institutional Uses (Hospital, Campus)

Intensively Developed Military

Large Lot Residential (1 unit per 10 acres to 1 unit per 19.9 acres)

Light Industrial

Low Density Urban Residential (1.1-3 Units/Acre)

Mixed Use

Mixed Use/Planned

Port Alberni   Vancouver   Richmond   Grand Forks

Nanaimo   Surrey

Duncan   Okanogan National Forest

Victoria   Colville Reservation

Stra   Wenatchee National Forest

Wenatchee

WASHINGTON

Olv Nat Fo

oqualmie National Forest

Yakima

Gifford Pinchot National Forest   Yakama Nation Reservation

Yakama Indian Reservation   Kennewick

0   30   60mi

COASTAL RANGE   Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | Washington Sta...

Penticton

**New Housing Units
2001-2017**

New Units 2001 to 2017

1 Dot = 10

NEW_00_17
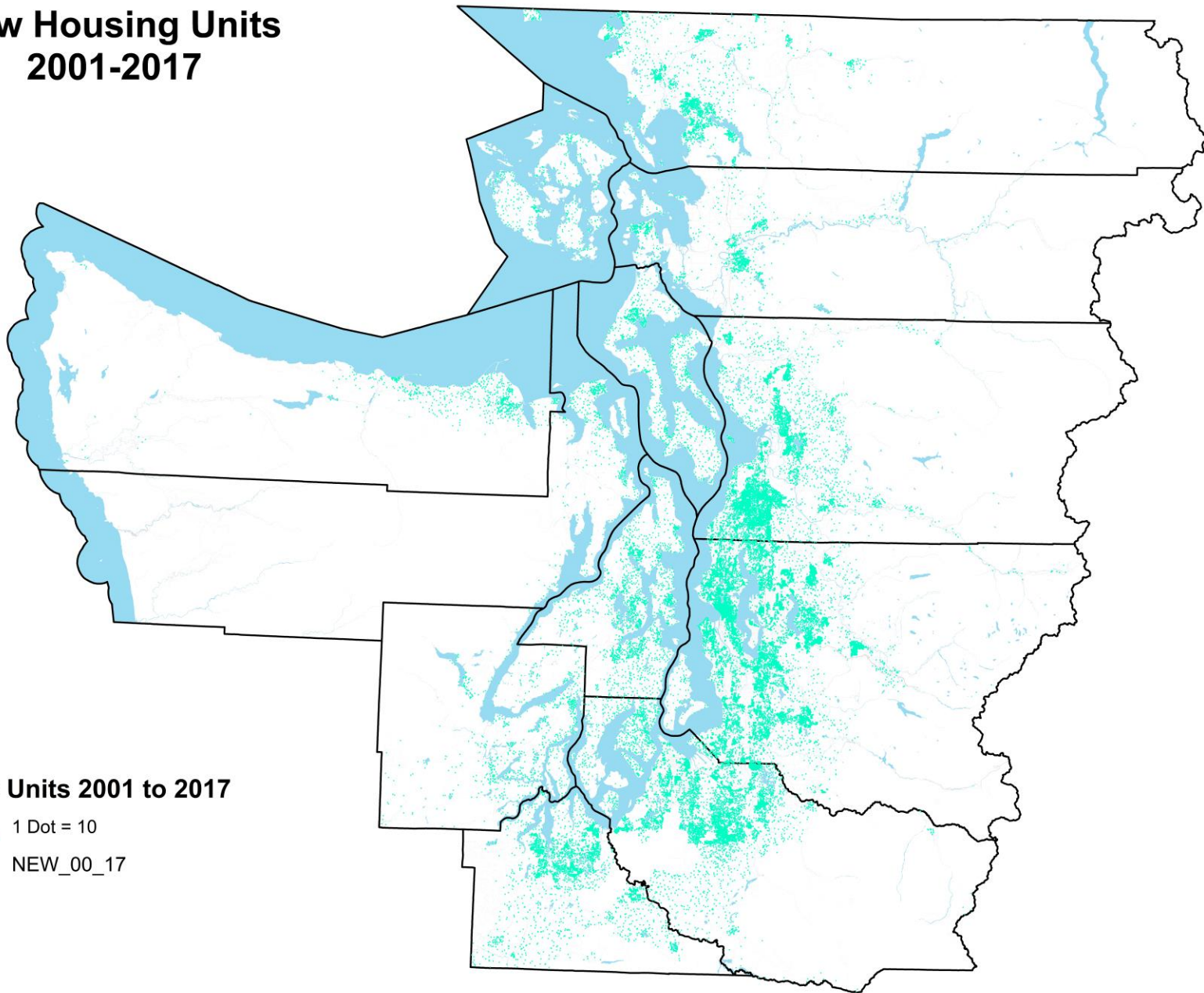
Puget Sound Mapping Applications

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Applications - Project Applications

Integration with other data sets and measures

- Watershed characterization,

- High resolution change detection,

- Ecologically important areas, and

- Puget Sound Nearshore Ecosystem Restoration Project (PSNERP).

Provide tools for local planning

- Help visualize and understand existing conditions and trends

- Show areas with significant development

- Prioritize implementation of growth measures and restoration
  - Septic replacement/sewer extensions
  - Adjusting zoning standards
  - Habitat/open space conservation

Applications - Supplemental Uses

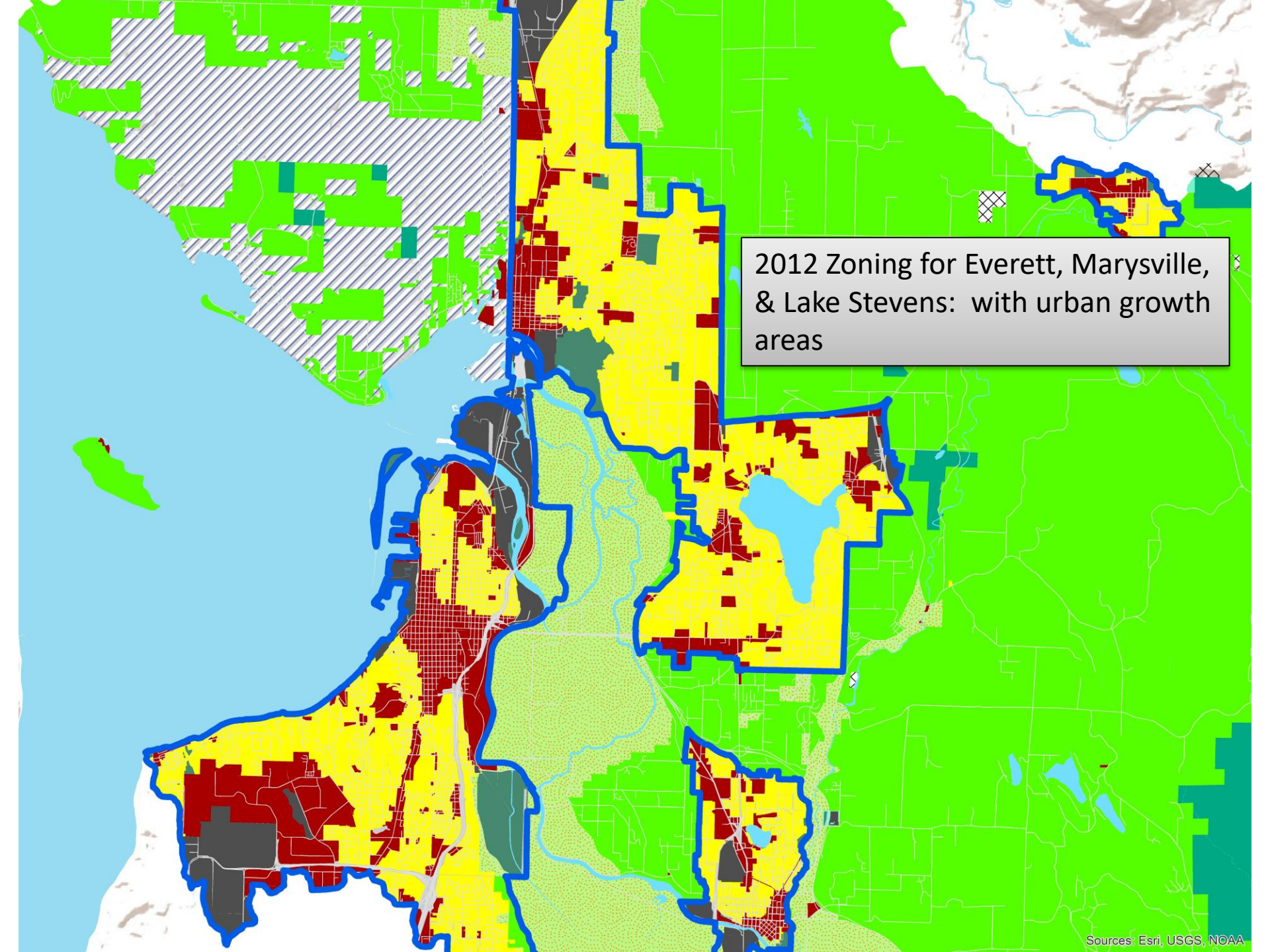**Provide tool for evaluating resource loss**

- Depict agricultural and forest areas at risk

- Environmentally sensitive/critical areas

- Open space and habitat

- Depict growth and land uses within 200 feet of streams
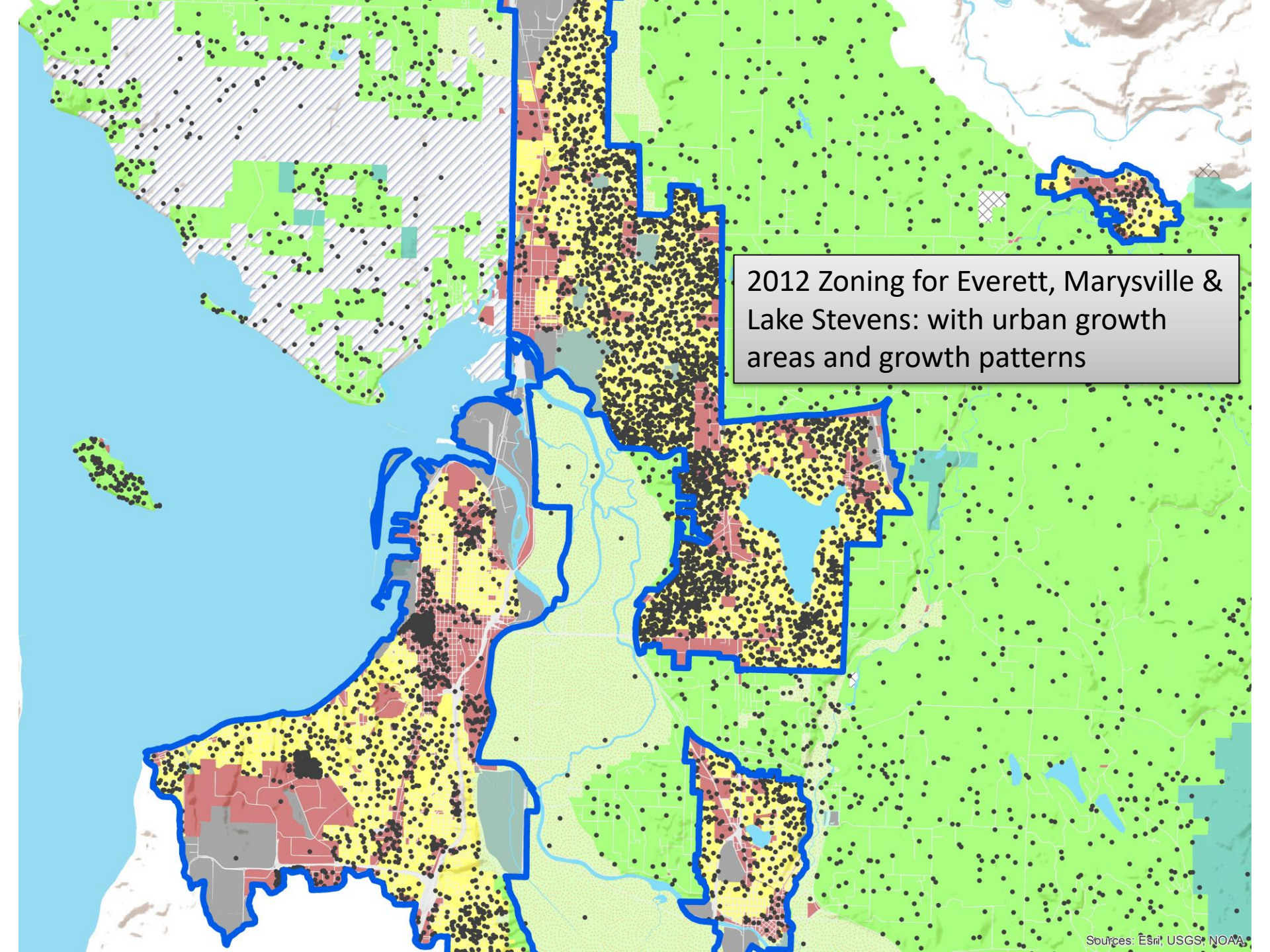
Applications - Project Examples

2012 Zoning for Everett, Marysville & Lake Stevens

2012 Zoning for Everett,
Marysville & Lake Stevens
(without urban growth
areas)

2012 Zoning for Everett, Marysville, & Lake Stevens: with urban growth areas

2012 Zoning for Everett, Marysville & Lake Stevens: with urban growth areas and growth patterns

Sources: Esri, USGS, NOAA

King County Case Study

Multi-Criteria Location Selection

Case Study Description

Finding sites for new apartment projects

- Close to
  - Transit Routes
  - Parks
  - Grocery Stores
  - Elementary Schools

- Have Multi-Family Or Mixed Use Zoning

Bus Routes

Kent
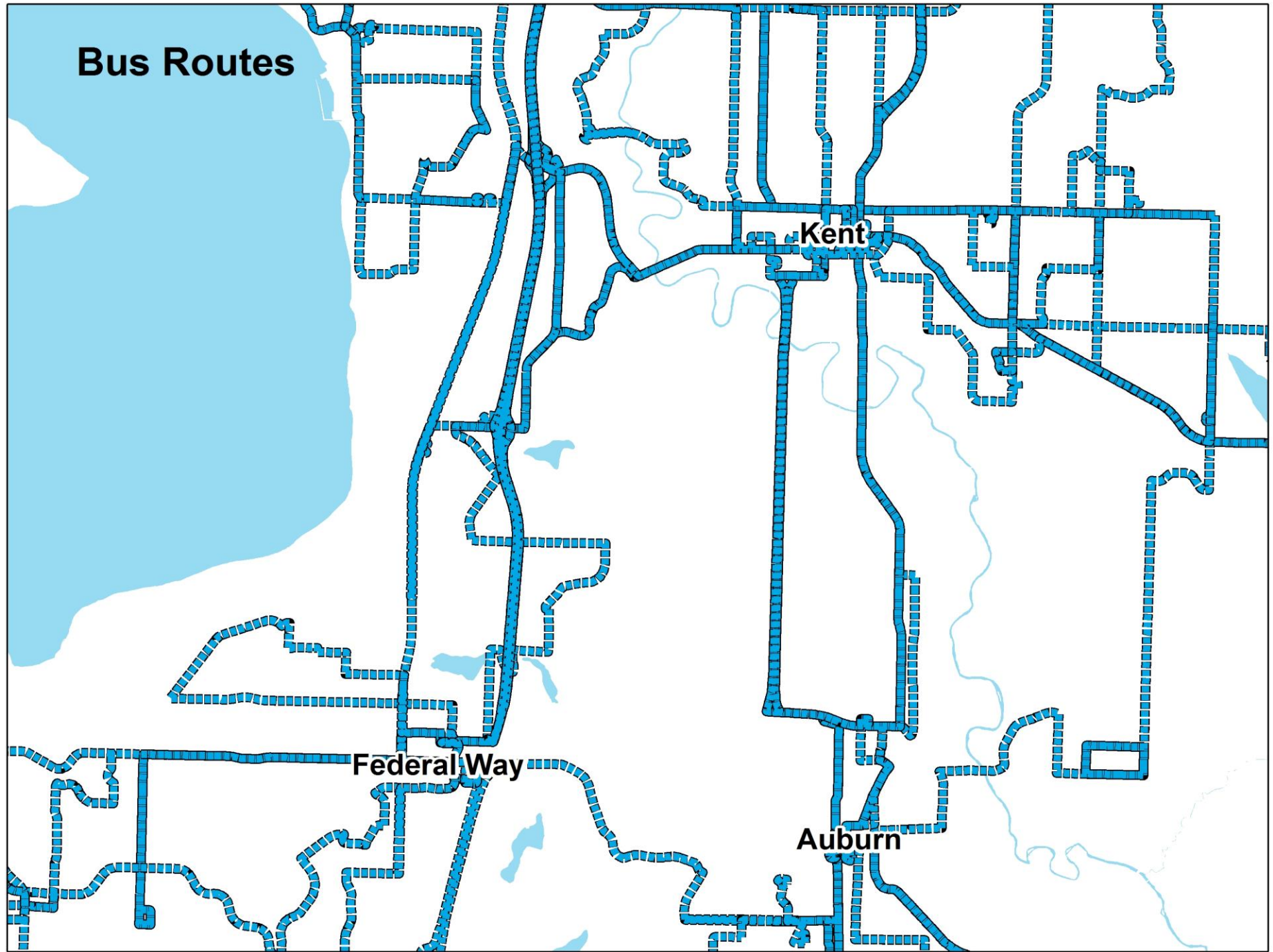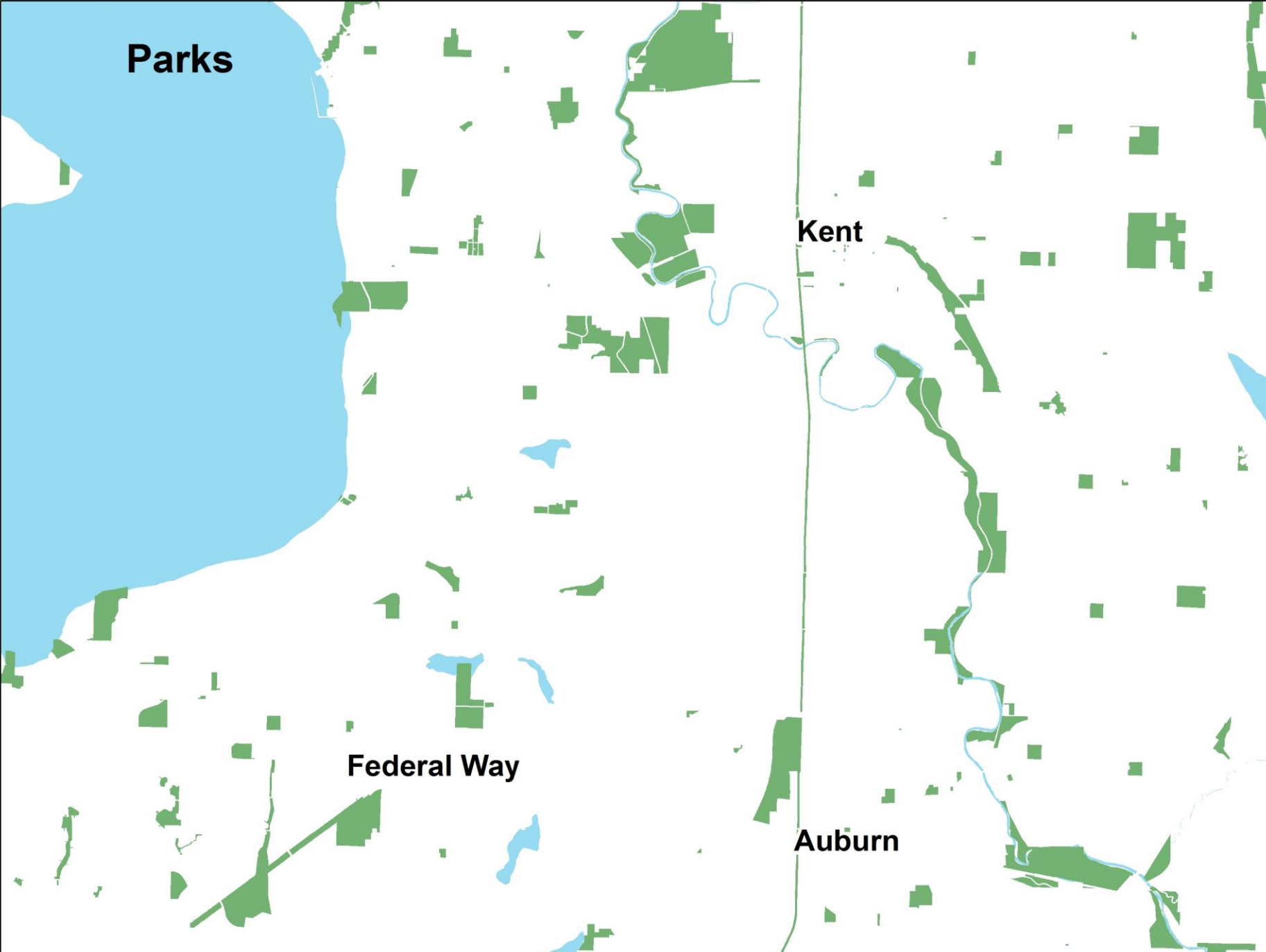
Federal Way

Auburn

Parks

Kent

Federal Way

Auburn

Grocery Stores

Kent

Federal Way

Auburn

Elementary Schools

Kent

Federal Way

Auburn
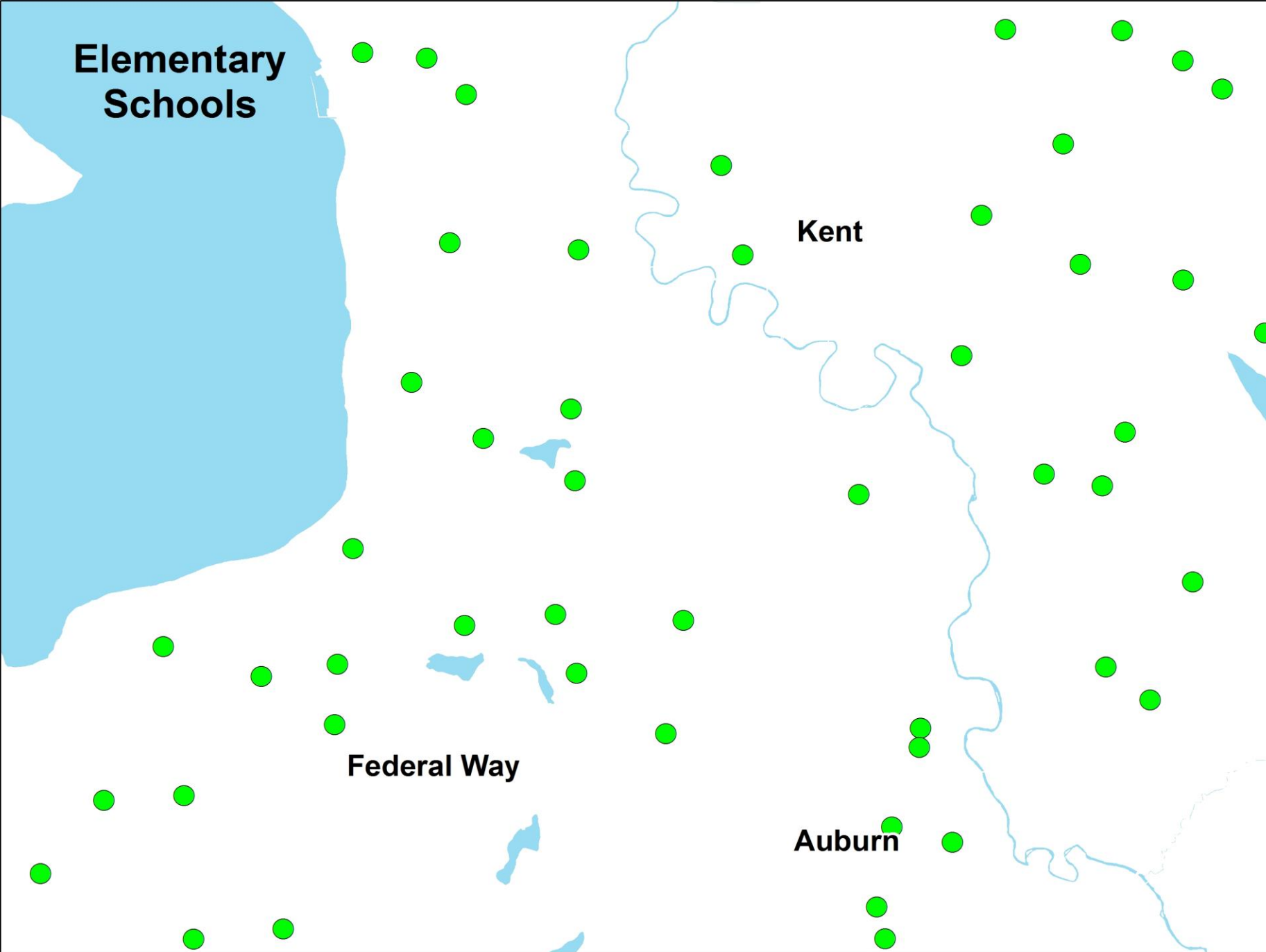
**Combined
Buffer**

MU & MF Zones

Kent

Federal Way

Auburn
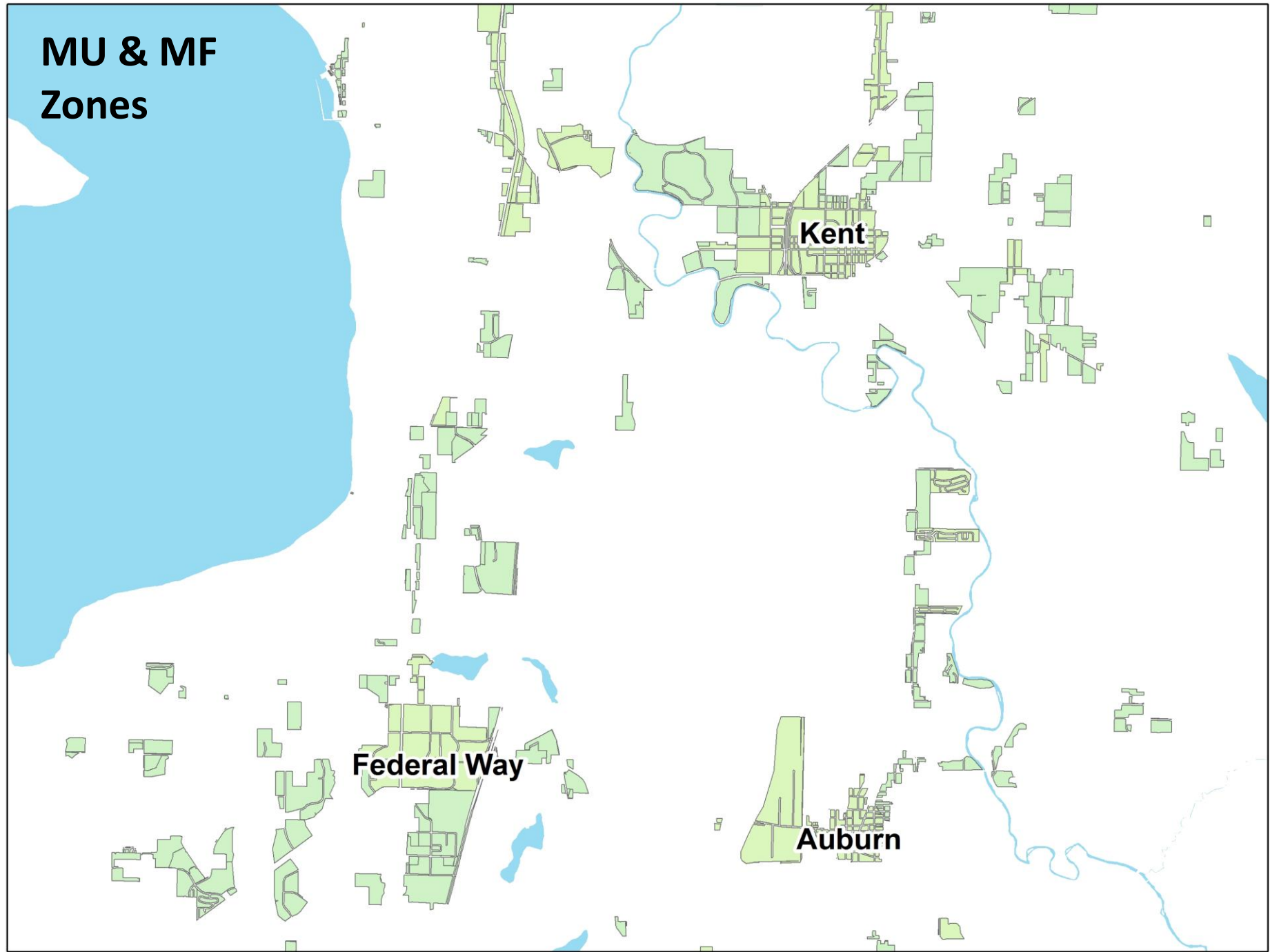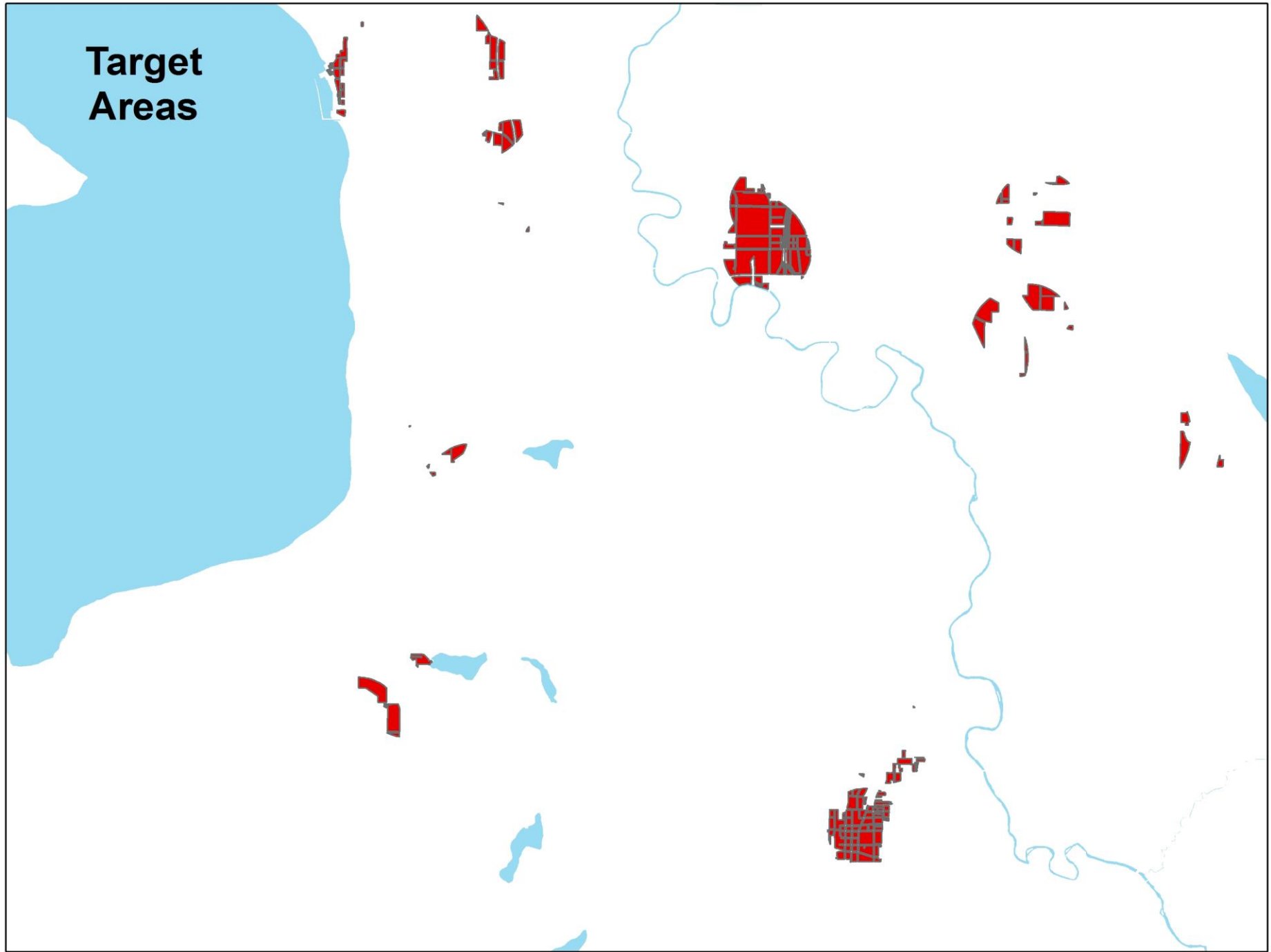
Target
Areas

Target
Areas
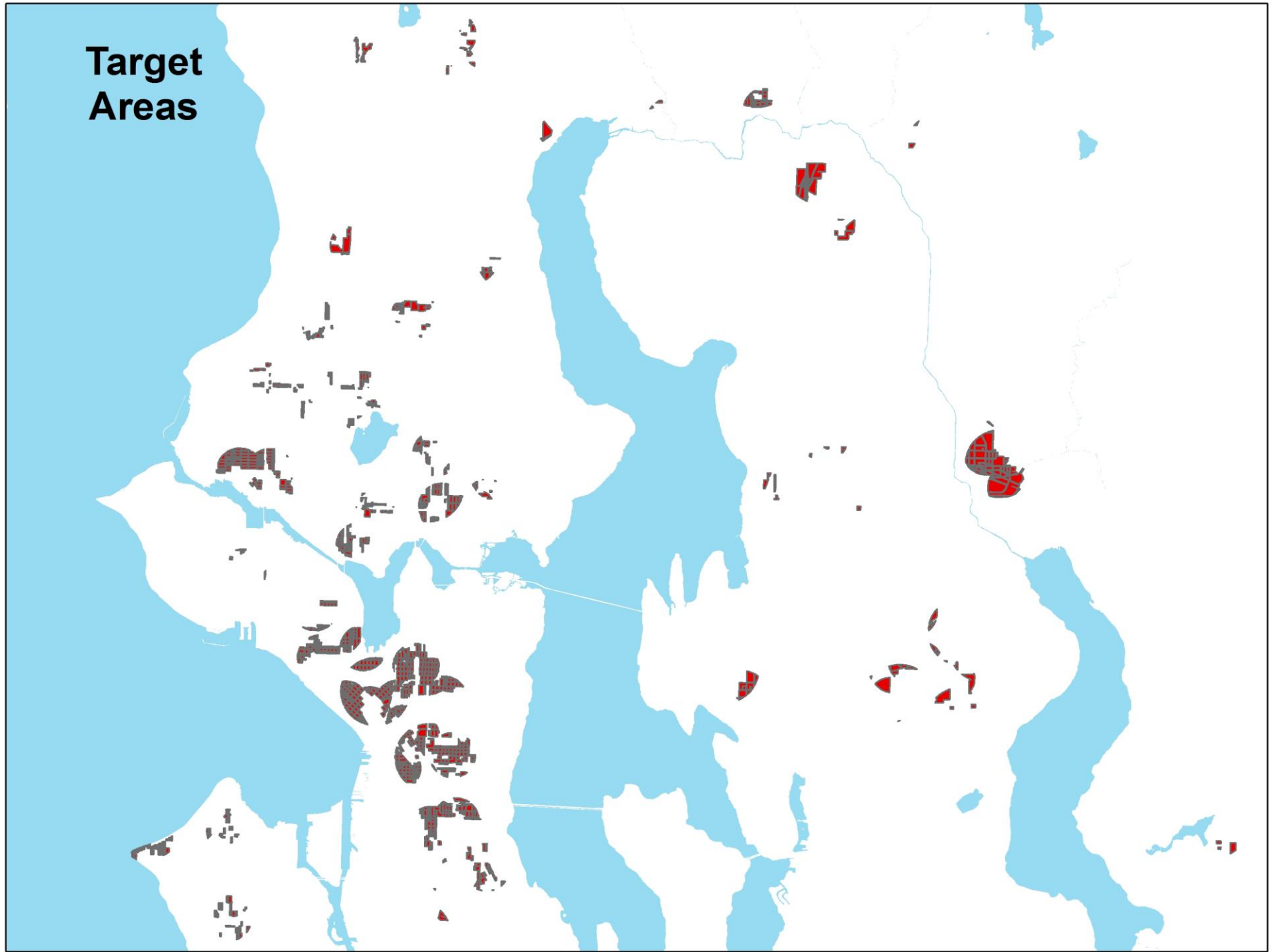
Potential Applications

for the Future

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Vision

- 2017 zoning update (and every 5 years)

- Expand to statewide

- Create new data sets

  - urban areas on septic systems

  - growth within floodplains

- Employment layer

- Assessor's record land use codes

- Growth targets as adopted by local plans

Overcoming Technical Challenges

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Technical Challenges

- File size problems – "Godzilla" incidents, especially for online hosting

- Convert comprehensive street line network into polygons

- Integration difficulties

  - Data overlaps, gaps, and mischaracterizations

  - Data errors created by geoprocessing (i.e., self-intersecting polygons)

  - Inconsistencies in reference boundaries and water features

Technical Learnings

File size problems

- To fix "Godzilla" incidents, first, measure the number of vertices in your layer – you need less than 2 million per layer. If you have more than 2 million, then break-down the map into pieces or sub-areas.

- To overcome online hosting issues create tiles when publishing.

Converting comprehensive street line network into polygons

- The Washington State Department of Transportation provides integrated street network layers, which can be converted from lines into polygons using the "Buffer" tool with a 30-foot off-set (this assumes a 60-foot Rights-of-Way).

Technical Learnings Continued

Integration difficulties

- To fix data overlaps use the boundaries from the Washington State Department of Ecology map for cities and urban growth areas to create uniformity.

- Fill data gaps with current information from the appropriate local assessor's records.

- To fix mischaracterizations begin by having more than one person characterize and look for areas where discrepancies in the categorization exist, then re-evaluate according to zoning code standards.

- Use the "Repair Geometry" tool after large geoprocessing tasks to prevent data errors.

- Consult data.wa.gov for the most current commonly used layers to fix inconsistencies in reference boundaries and water features.

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