A Statewide LiDAR Plan

Abby Gleason and Joanne Markert
GIS Day
Wednesday, November 14

LiDAR in Washington

- Elevation data is a foundational dataset. Higher resolution, more accurate elevation data produces better decisions, saves time, money, and potentially lives

Hwy 90, King County

Sauk River

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LiDAR in Washington

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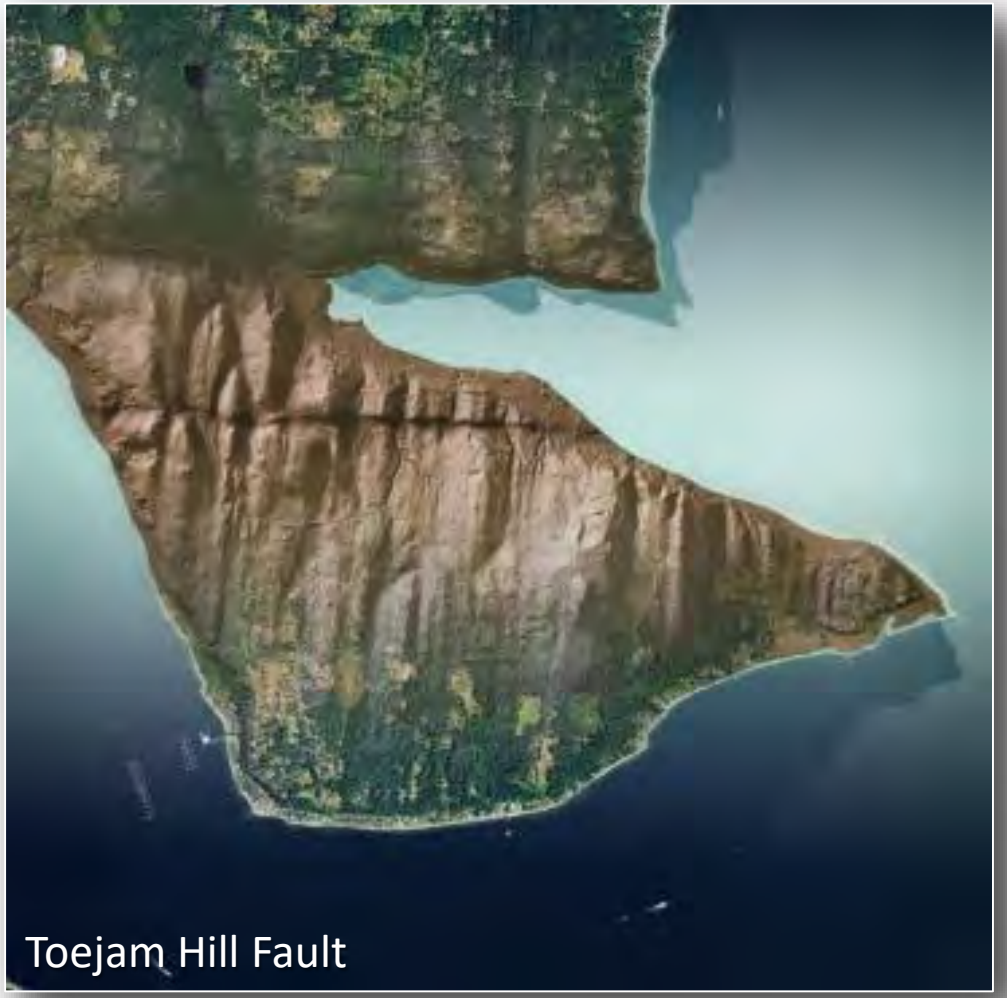
- LiDAR proved it self early on, with the identification of unknown faults under dense vegetation



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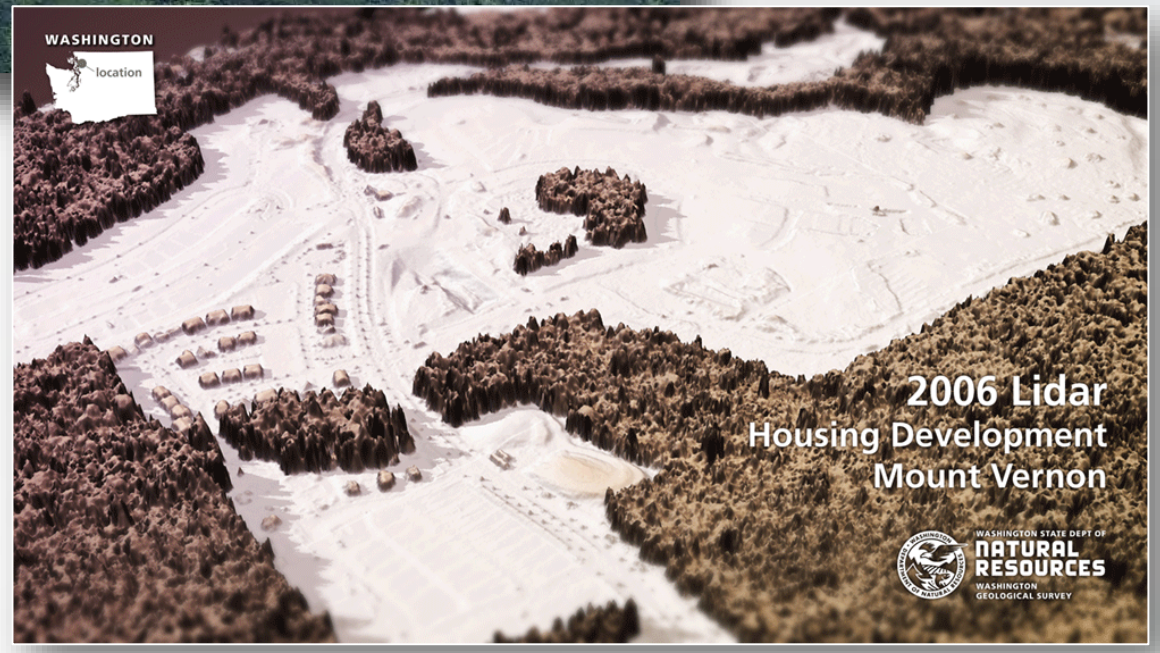

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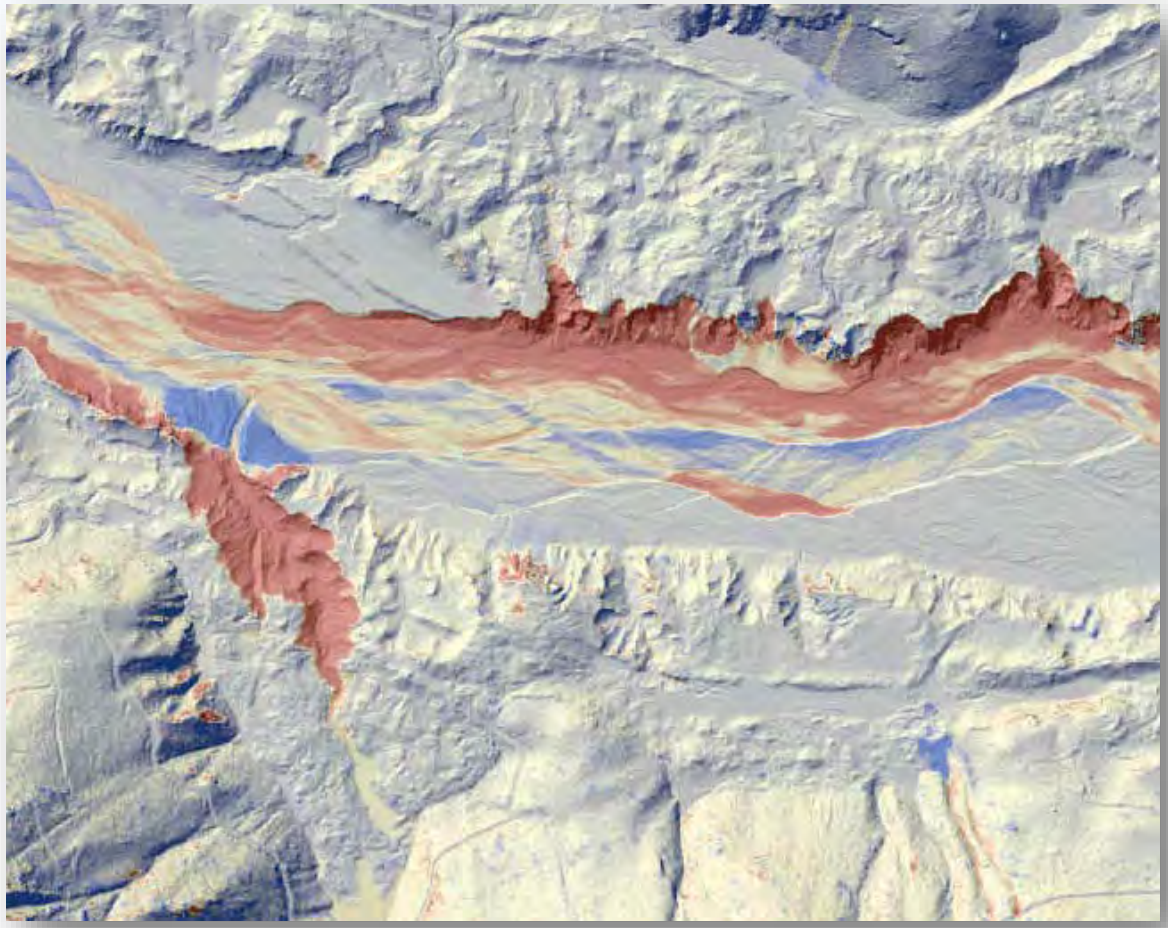
- LiDAR is now seen as critical for hazards identification, and also offers advances in forestry, habitat analysis, agriculture, and urban development
- Change analysis remains one of the most powerful applications of LiDAR

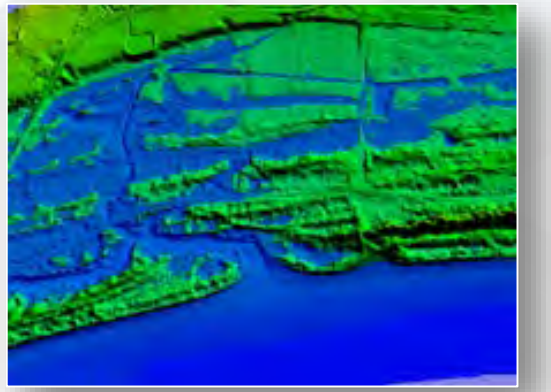


Change on the Toutle River, 2007-2012

Material removed

Material added

LiDAR Applications



Flood modeling, delineation of inundation zones

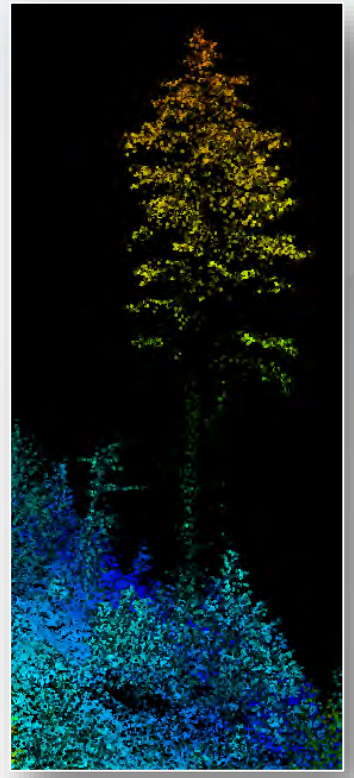
Lava flow, Skamania County

Geology

Wildfire mitigation

Agricultural applications

Forestry



Habitat Modeling

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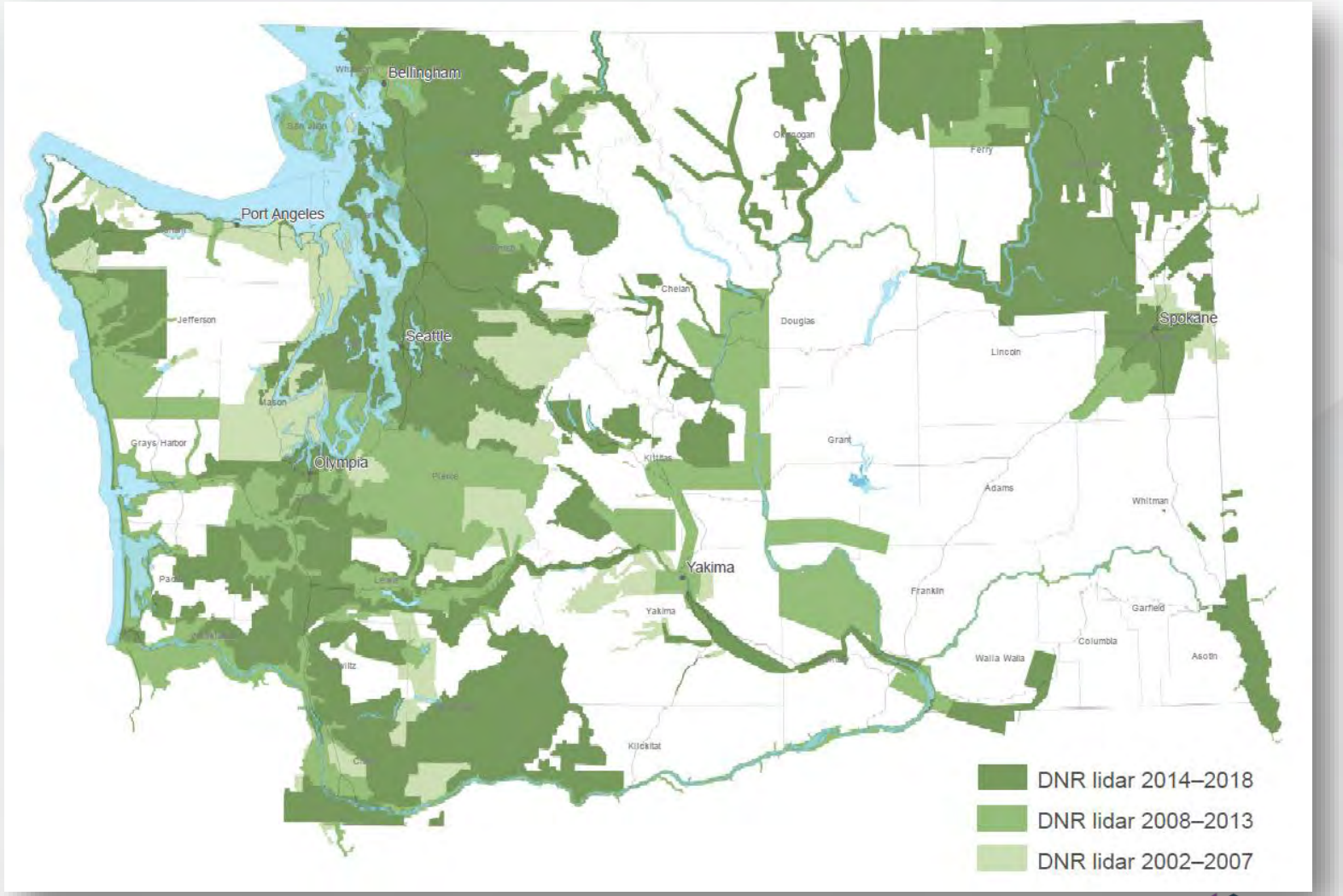
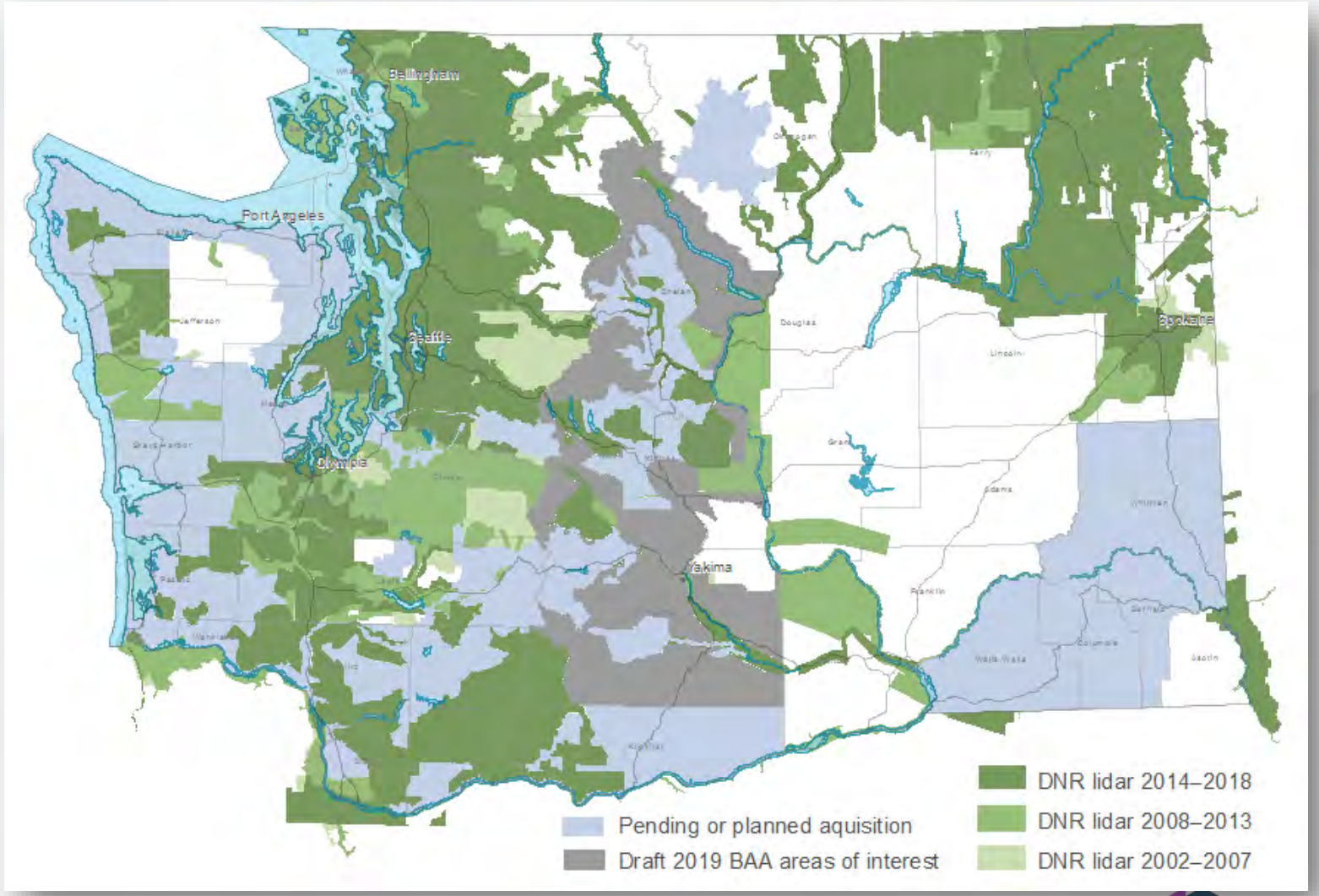
LiDAR Over Time

- LiDAR is a story of a patchwork quilt in Washington – both in time and in quality



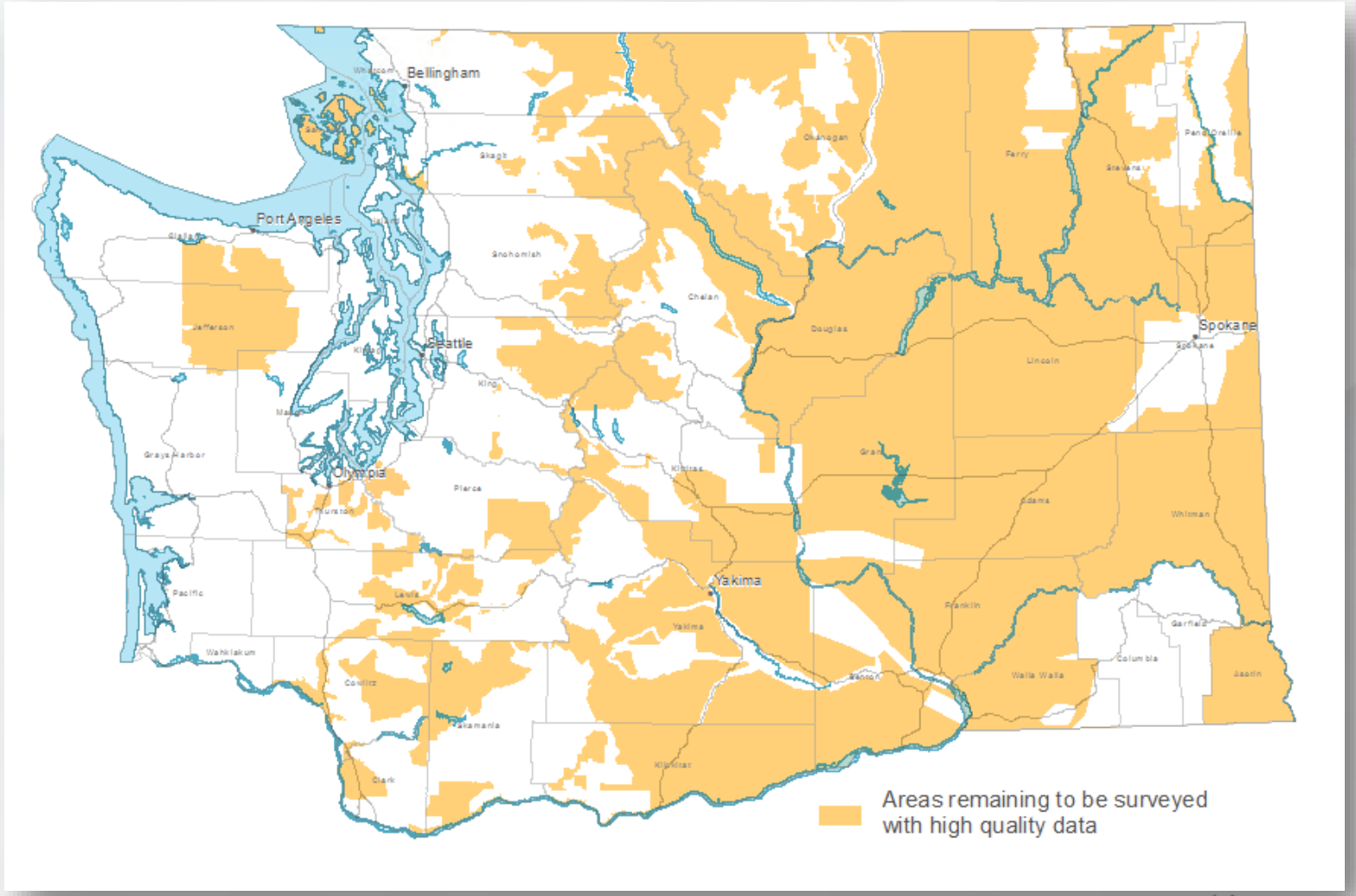
LiDAR Over Time

- LiDAR is a story of a patchwork quilt in Washington – both in time and in quality
- WGS, counties, other agencies have added a lot of area over the last few years, and plan for more



LiDAR Over Time – What Remains

- LiDAR is a story of a patchwork quilt in Washington – both in time and in quality
- WGS, counties, other agencies have added a lot of area over the last few years, and plan for more
- Even still, there is a lot of area left, quality issues remain, and refresh rates of older LiDAR need to be established



Planning for the Future

Goal for LiDAR is ***statewide coverage with a plan for refresh rates***

Over the last few years, we've seen:

- Increased interest from partners in LiDAR
- Economies of scale by working together
  - Collect once, share many times
  - Lessons learned in one location, applied to another
- Previous plans for statewide coverage would take a long time to capture with available funding. More partners can decrease timeframe for statewide coverage.

Mima Mounds

Planning for the Future

- Always had a plan, but need something more formalized and available to help coordination among many potential partners
- National States Geographic Information Council (NSGIC) partnered with USGS to offer the opportunity to standardize LiDAR plans across the nation
- Washington volunteered to be a pilot state to develop a statewide LiDAR plan via NSGIC
- USGS BAA Grant Program prefers a statewide, multi-year plan

Skagit River

The Washington LiDAR Advisory Group

State-wide collection is a huge goal that benefits all stakeholders in Washington, but it cannot be done without collaboration:

- Work together on a project and pool funding resources
- Synchronize project areas to extend a collection area
- Share project extents and intents early to facilitate decision making

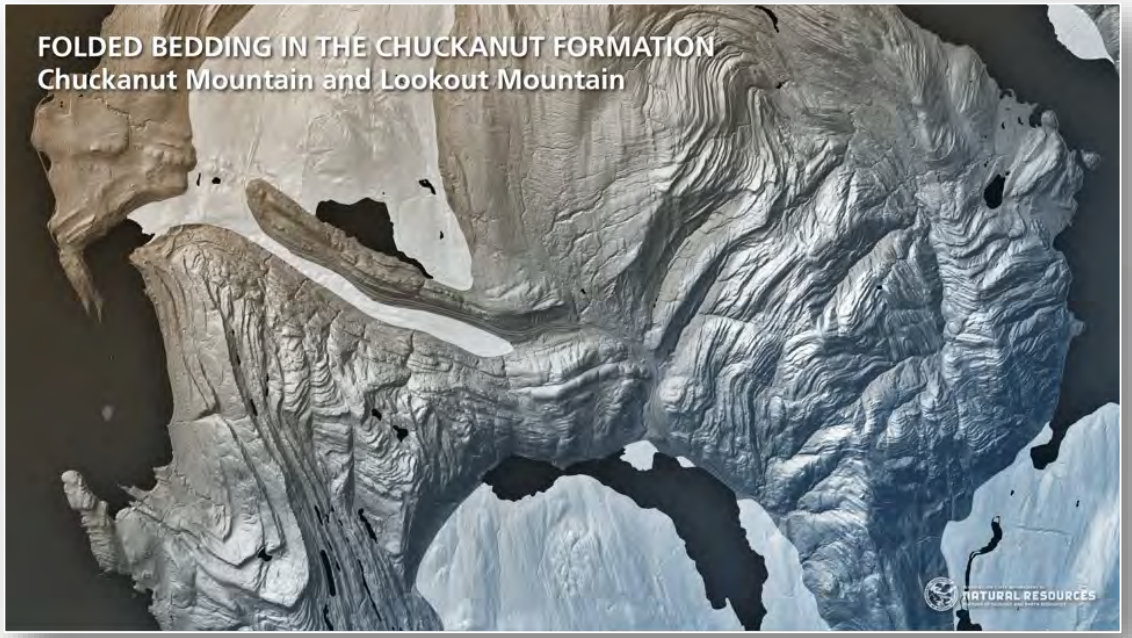
The Washington LiDAR Advisory Group will be able to accomplish these goals

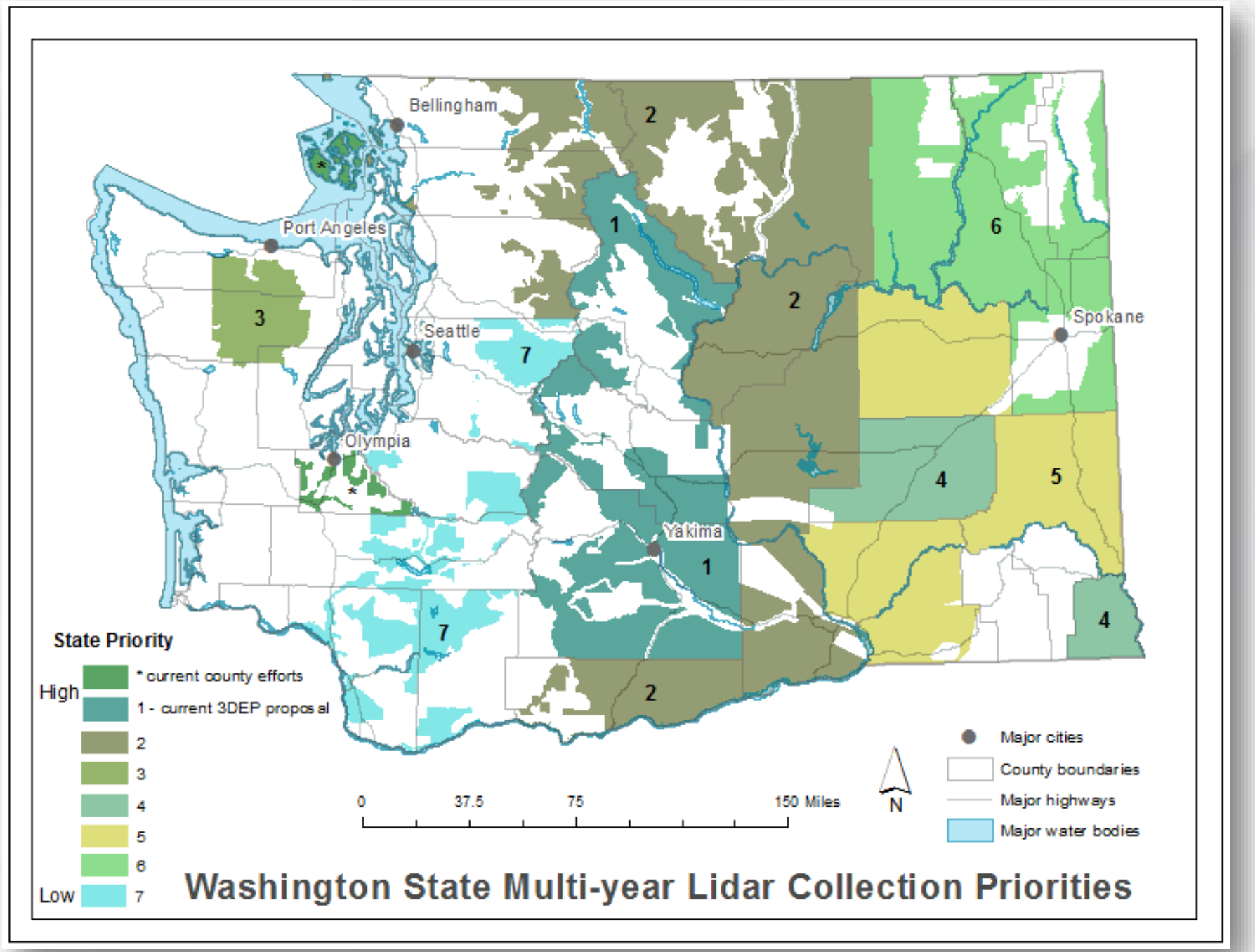
The Washington LiDAR Advisory Group

To get started, stakeholders met in September and October to discuss:

- How LiDAR is used in Washington
- LiDAR collection priorities
- Quality and data standards
- Funding concerns and strategies

The group will review the state LiDAR plan in January





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WA State LiDAR Plan: Next Steps

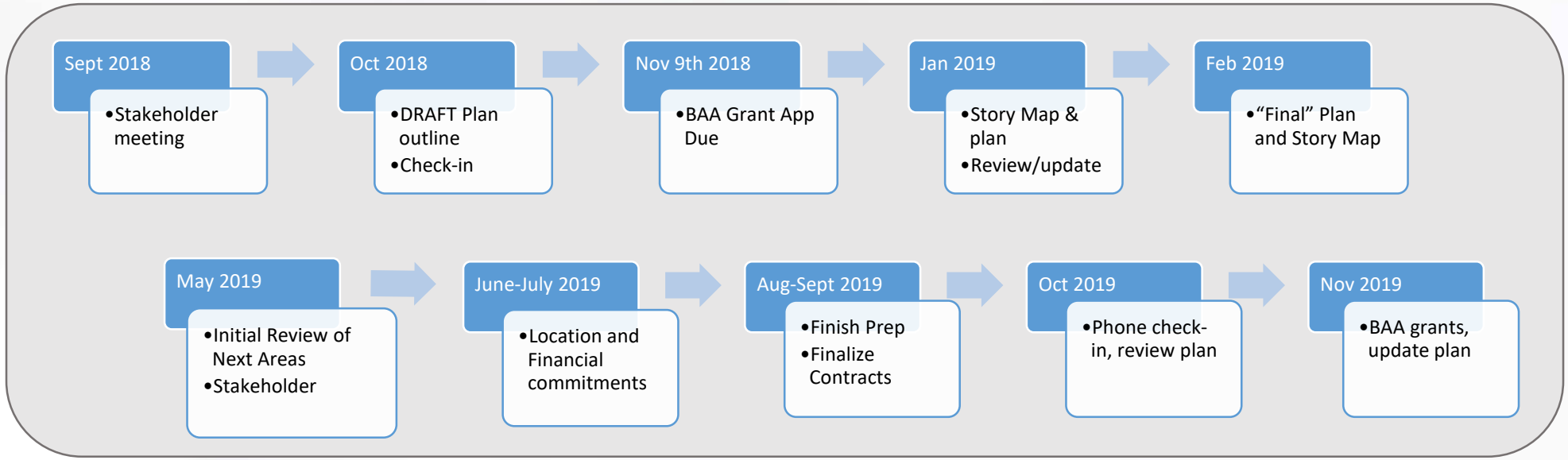
The plan will be reviewed by the stakeholder group in January and published in February, 2019

Ultimately, the plan will consist of:

- Plan document
- Corresponding Arc Online story map
- Area collection tool to understand where LiDAR is needed – not just in areas with no LiDAR, but for updated data as well

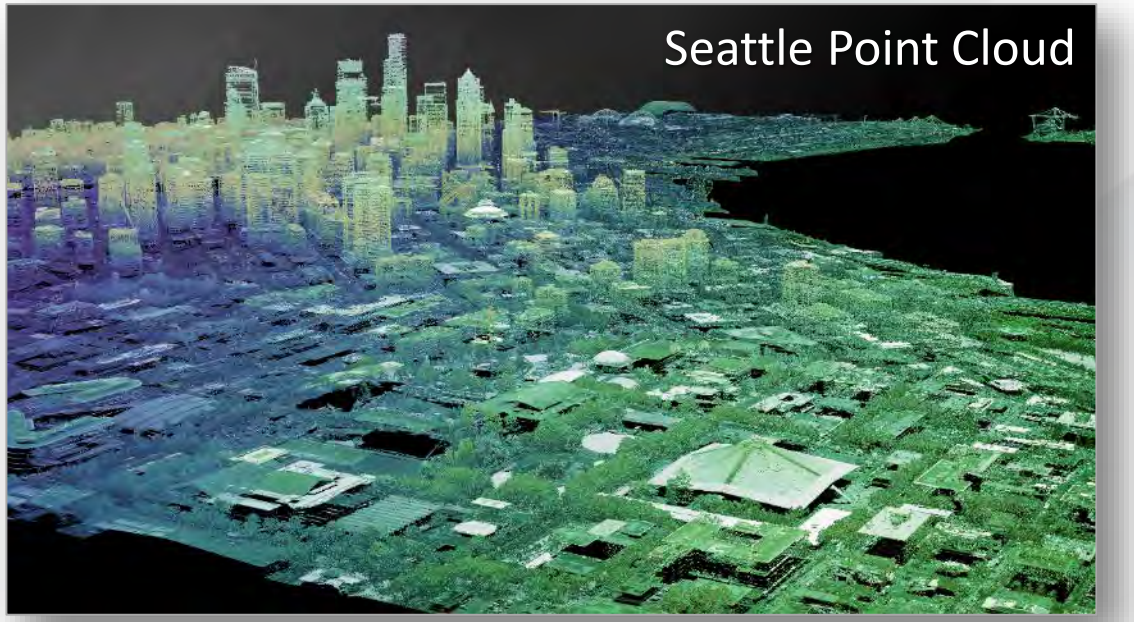
Coordination Efforts

- State LiDAR plan published in February
- Group meets yearly in May to discuss new priorities and update map, opportunities for collection
- Check-in in October, help with any USGS BAA grants in process



WA State LiDAR Plan: How to get Involved!

- If you'd like to be a part of the stakeholder group, please let Joanne or Abby know and we'll add you to the list!
- Additionally – please let us know if your agency has an established elevation plan, is considering a LiDAR collection, or has a need for LiDAR in a particular area



Thank You! Questions?

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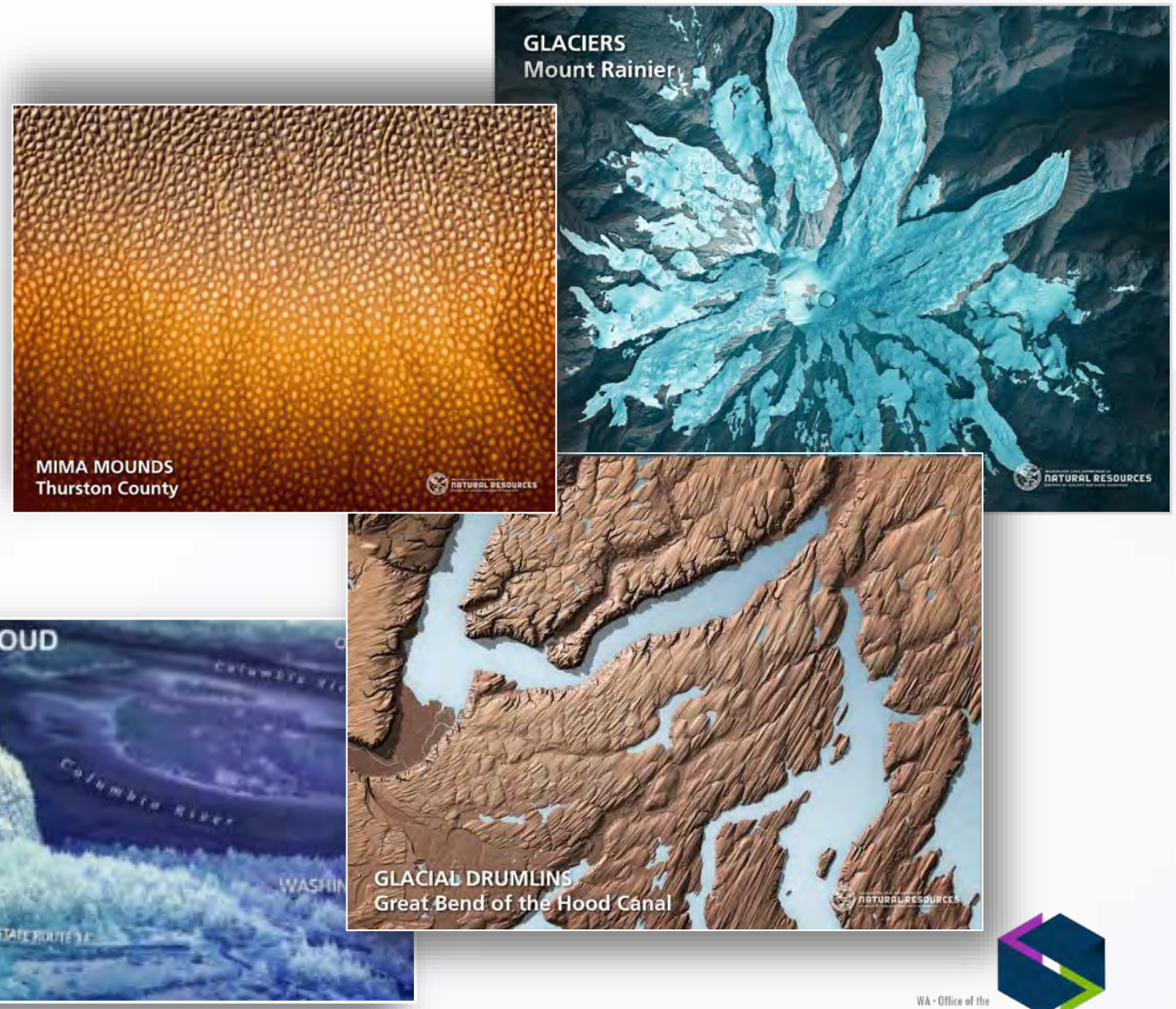

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WGS Role and LiDAR Program Background

RCW 43.92.025, 2015: The Washington Geological Survey must acquire and process new LiDAR data or update deficient data and create and maintain an efficient, publically available database of LiDAR data

Program goals:

- high quality LiDAR collection to support geologic hazards
- Standardize and QA the collection and provide mechanisms for public distribution
- State-wide LiDAR coverage to support all applications

Public Distribution, the LiDAR Portal

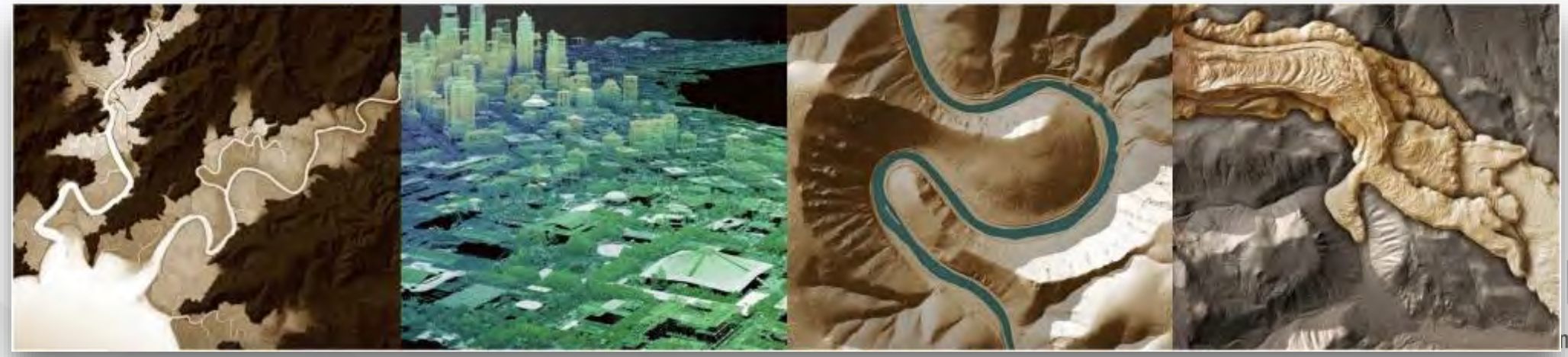
- Free to the public for data download
- Point clouds (.laz), DEMs, hillshades available
- Area of interest or project wide download options
- Data viewable at full resolution, great for exploring Washington's topography and features

- Visit http://LiDARportal.dnr.wa.gov
- Mosaic also available through the Geologic Information Portal and as a GIS service

Washington LiDAR Portal

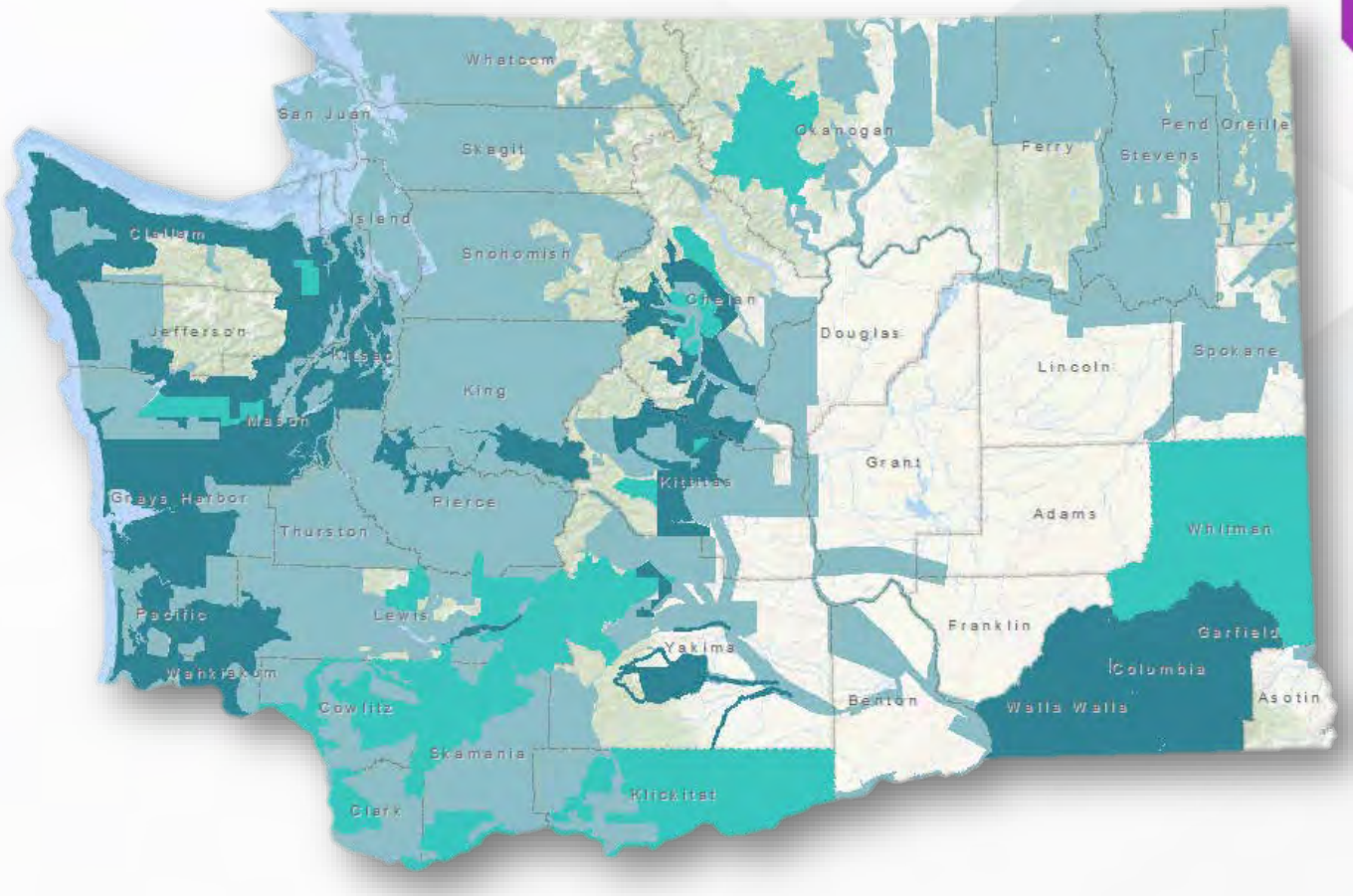
LiDAR data standards on the Portal:

- Projection for all files: Washington State Plane South
- DEMs and hillshades in TIFF format
- LAS data is compressed into LAZ format to save space
- Note that most applications will need the data to be uncompressed!



Other Agency LiDAR Collection

- Federal agencies also have priorities in Washington – FEMA and USFS
- Mixture of pulse density/quality levels/environmental conditions
- With DNR projects, collection in 2017-2019 will be over 17,000 square miles



Other agency 2017-2019 collection

WGS 2017-2019 LiDAR contracts/partnerships

Current state LiDAR (both high and lower quality)

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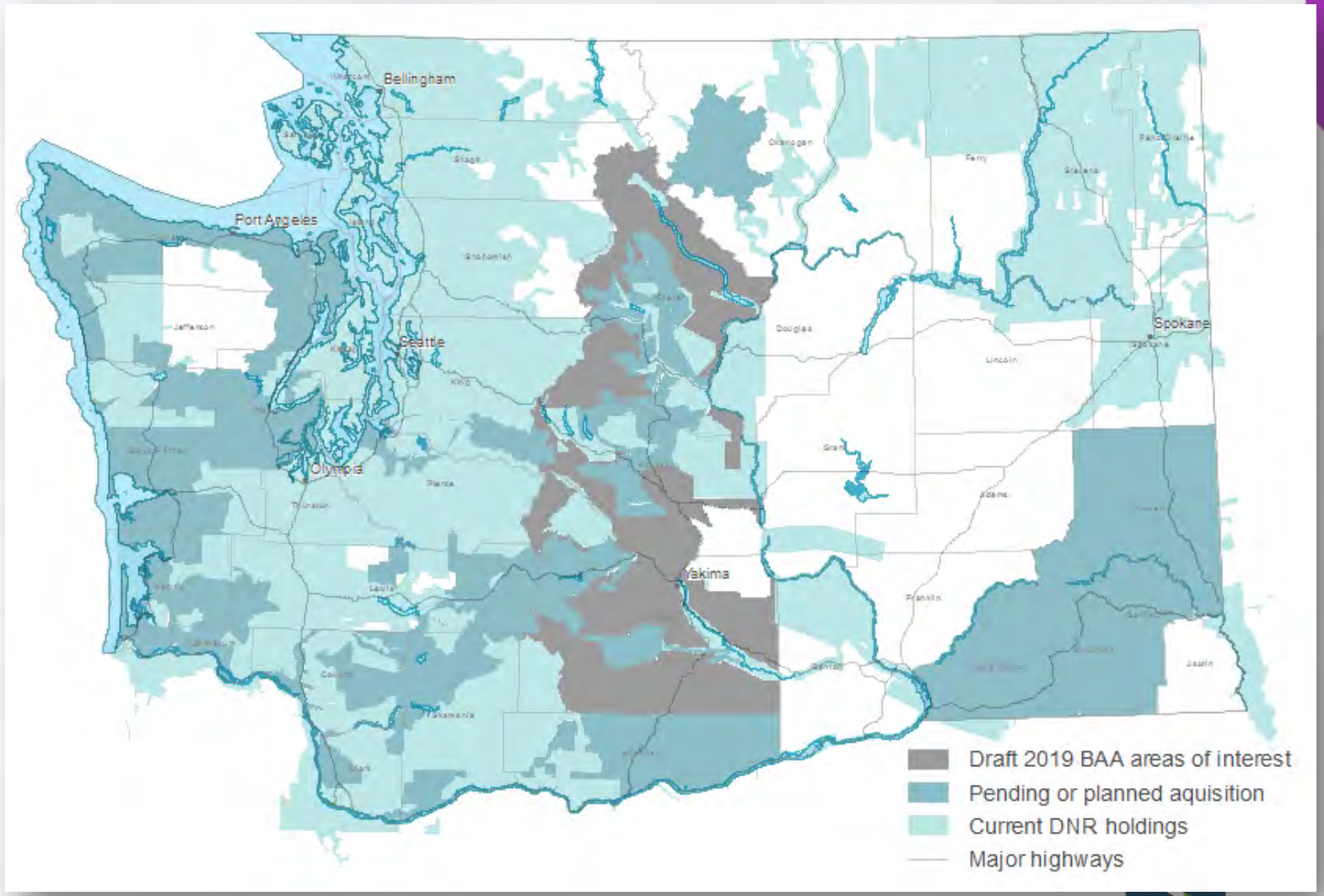
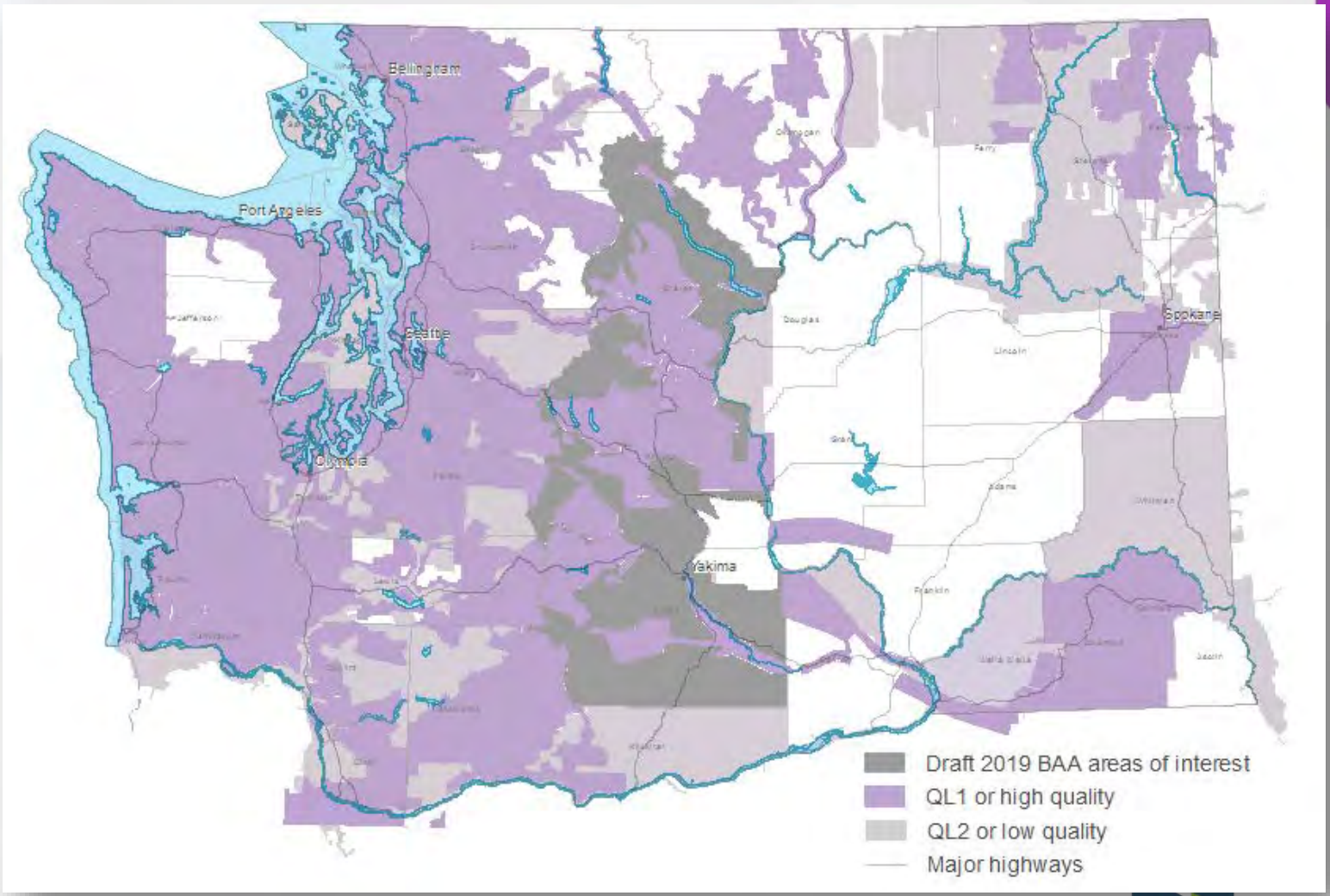
2019-2021 Collection (draft)

- Area is focused on Eastern Cascades, filling in Yakima, Kittitas, and Chelan Counties
- Apply to USGS 3DEP grant program in Fall 2018
- Collaboration and partnerships needed to complete area!
- Same map as “Current, Pending, and Planned” in the room



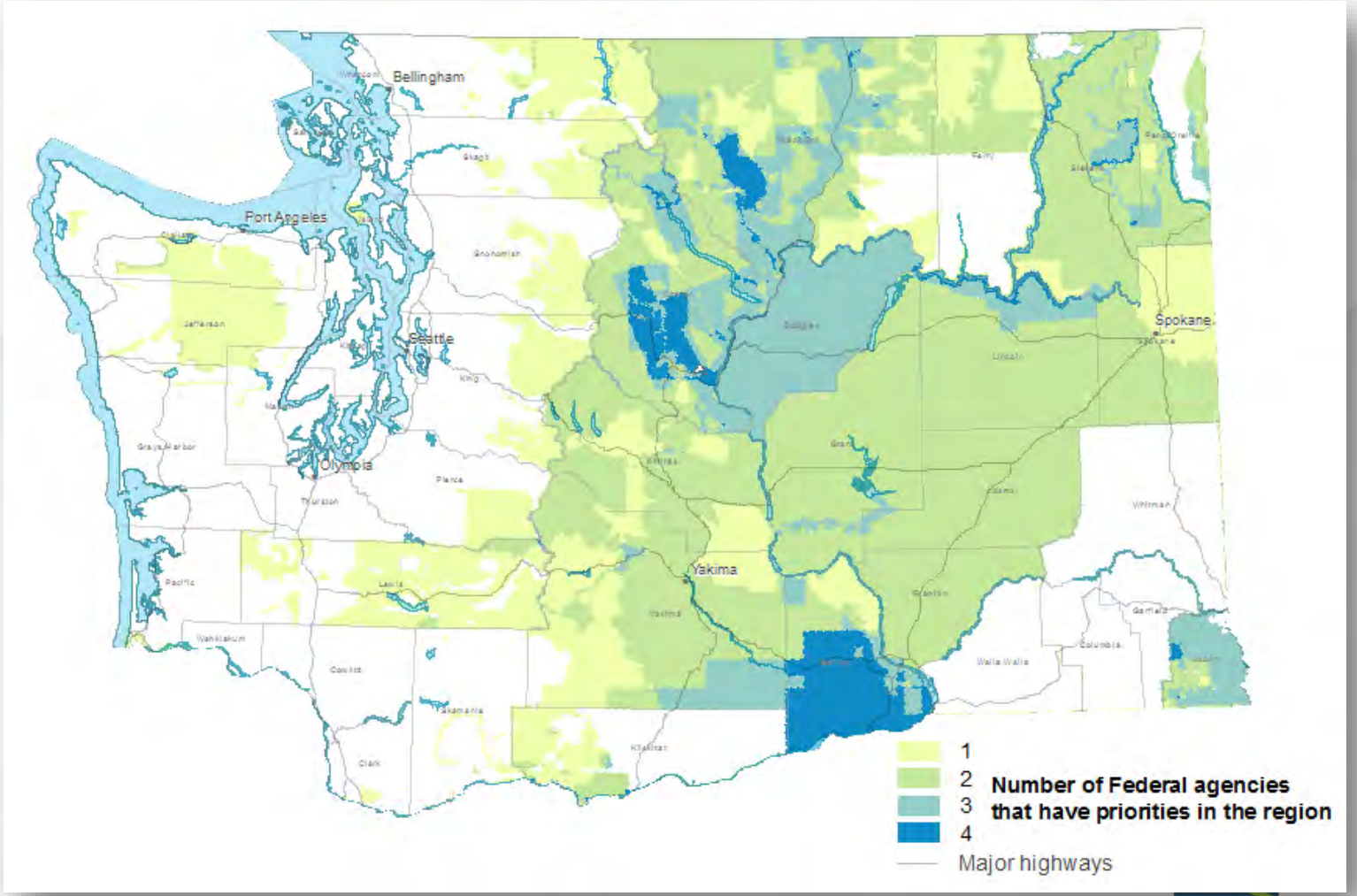
LiDAR Quality

- The LiDAR data across the state, based on quality level
- The use and application of the data are affected by quality
- “QL1” and “QL2” are quality levels defined by the USGS LiDAR Base Specification



Federal Priorities

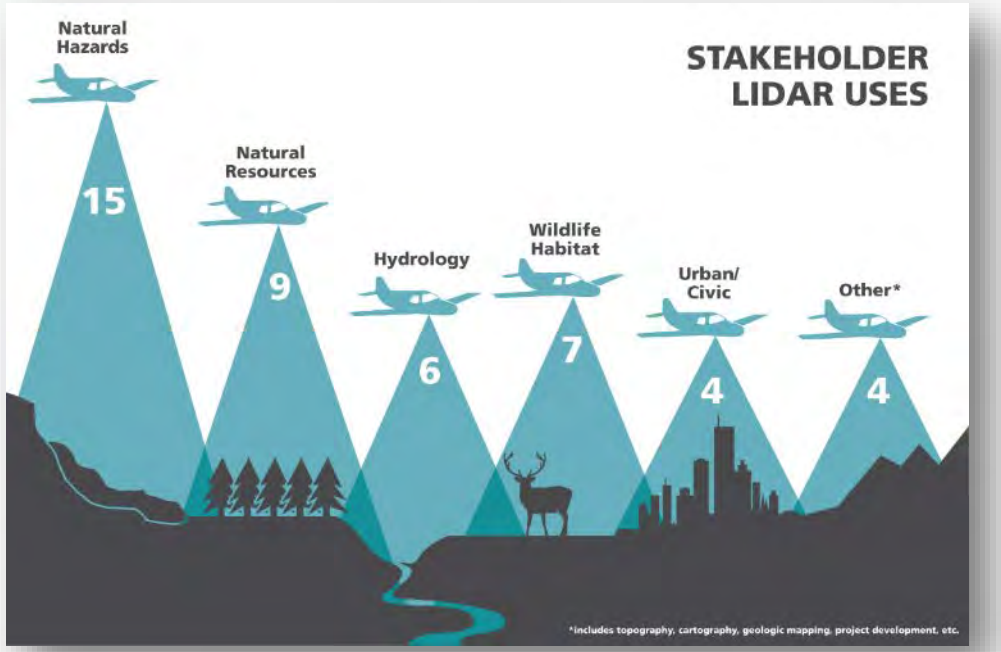
- For the USGS Broad Area Announcement (BAA) opportunities, consideration is given to where Federal agency priorities align
- Federal agencies that are represented here are:
  - FEMA
  - USGS
  - USFS
  - NRCS
  - USDA
  - USFWS
  - NPS



LiDAR Use Cases

Higher point density use cases (8 – 20 ppsm):

- River side channels
- Agricultural field drainage
- Landslides
- Woody debris
- Individual trees, shrubs
- Levees
- Sub-canopy structure

Lower point density use cases (2-8ppsm):

- Floodplains, modeling
- Forest stands height and cover
- Detection of surface water