Development of 6th- and 7th- Field Hydrologic Units

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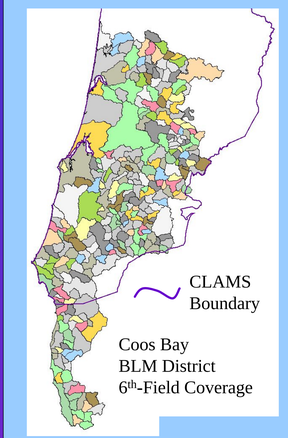
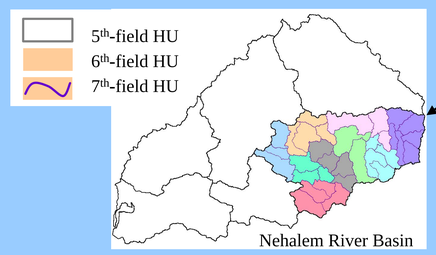
Introduction

Hydrologic Units (HUs) are useful for landscape analyses because they:

- indicate direction and movement for water and other gravity-influenced processes;
- can be hierarchically nested;
- represent a stable and consistent method to divide the landscape into approximately equal areas;
- are convenient for the exchange of landscape information.



Existing 6th- and 7th-field HU coverages were available only for federal lands and did not follow a consistent delineation process.



Although available for the entire study area, existing 5th-field HUs were too large (16,000-100,000 ha) for our intended uses.

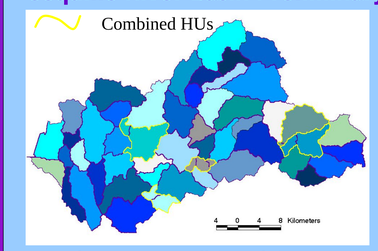
For use in CLAMS, the HUs should:

- be consistently-sized for the study area;
- follow established HU guidelines;
- be attributed with identifying information and basin type;
- have a basin-numbering scheme to identify all upstream HUs.

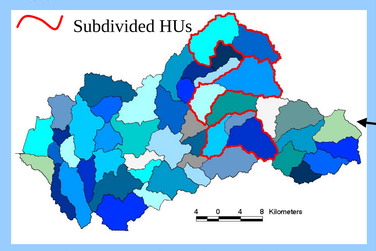
Hydrologic Unit Delineation

Preliminary HUs were delineated using the USGS GIS weasel. The input HU threshold size approximated the Siuslaw National Forest and BLM hand-drawn 6th-field HU sizes and met the National Resource Conservation Service guidelines. The line work was improved by eliminating sliver polygons and hand delineating HU boundaries in coastal areas where automated delineation produced hydrologically incorrect boundaries

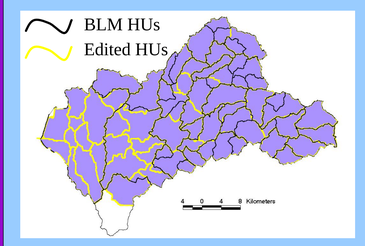
Coquille River Basin Preliminary HUs



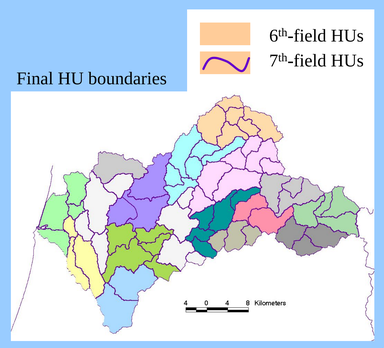
HUs that were too small (<600 ha) were combined to an adjacent HU.

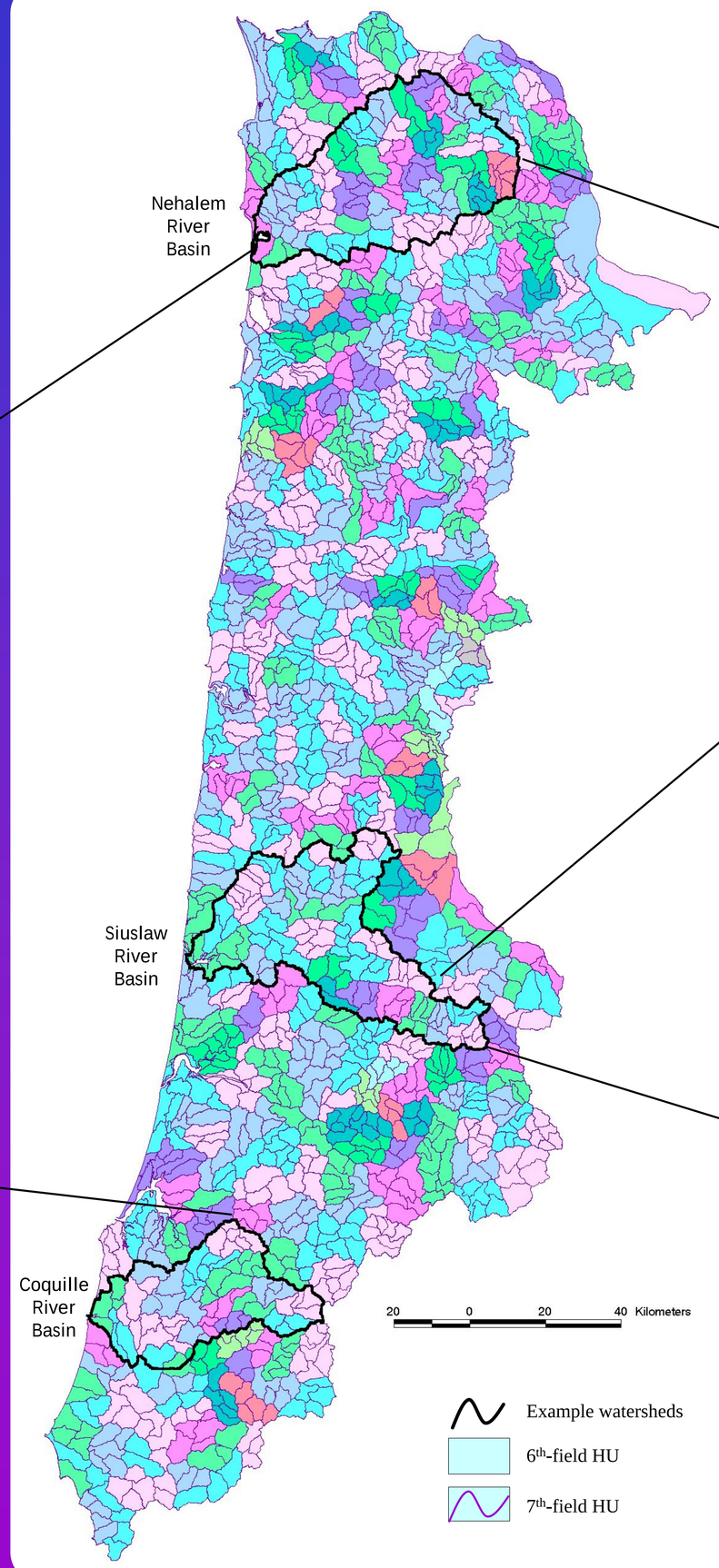


HUs that were too large (> 6000 ha) were subdivided by hand.



We collaborated with ongoing federal efforts to modify and standardize HUs. This effort produced the 6th and 7th-field data set.

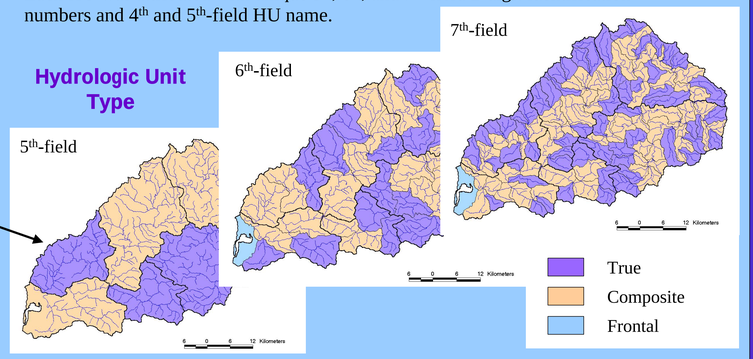




Hydrologic Unit Attributes

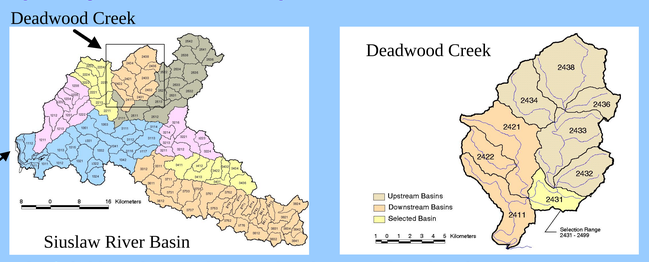
Each HU was attributed with unique 5th, 6th, and 7th-field 2-digit identification numbers and 4th and 5th-field HU name.

Hydrologic Unit Type



Each HU was attributed with codes to differentiate between true, composite, and frontal watersheds for each level of the HU hierarchy. A true HU has one outlet and is traditionally referred to as a watershed, a composite HU has an inlet and an outlet, and a frontal HU contains streams that are hydrologically unconnected and for this region are generally located along the coast or Columbia River.

Hydrologic Unit Connectivity

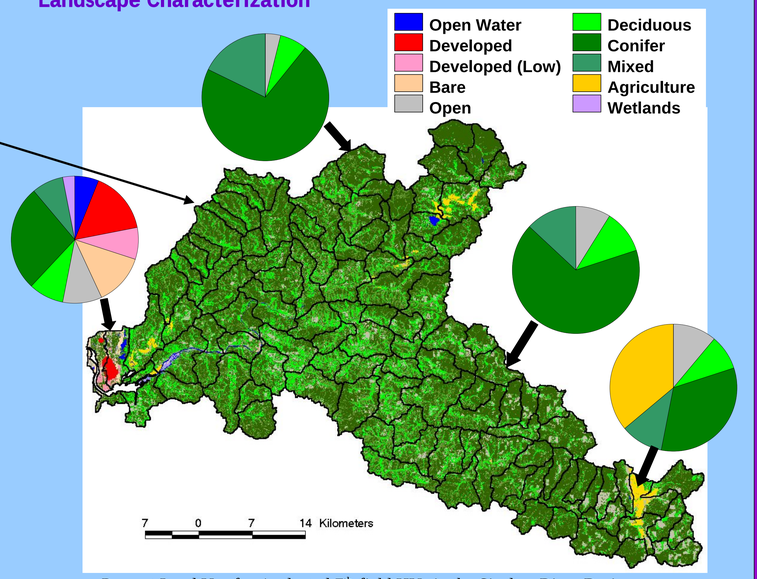


Each 7th-field HU has a 4-digit number that is used to identify any upstream HUs. The numbering scheme was adapted from *Verdin and Verdin (1999).*

Uses of Hydrologic Units

Hydrologic units are being used in CLAMS to characterize landscapes for developing watershed condition indices; modeling relationships among instream biota, freshwater habitat, and upslope conditions; and extrapolating model predictions to other similar areas.

Landscape Characterization



Percent Land Use for 4 selected 7th-field HUs in the Siuslaw River Basin

Hydrologic Units generated by CLAMS are being used by several other groups. For example, 6th-field HUs are being used by the Aquatic and Riparian Effectiveness Monitoring Plan (AREMP) as the basic geographic unit for monitoring (Reeves et al. in press) and by the Umpqua Land Exchange Project (2001) to characterize factors affecting channel processes and water quality.

Literature Cited

Reeves et al. In Press. Aquatic and riparian effectiveness monitoring plan for the Northwest Forest Plan. USDA Forest Service, PNW Research Station, PNW-GTR-XXX.

Umpqua Land Exchange Project-Consulting science team. 2001. Multi-resource exchange land allocation model handbook. Umpqua Land Exchange Project.

Verdin, K.L. and J.P. Verdin. 1999. A topological system for delineation and codification of the Earth's river basins. Journal of Hydrology. 218(1-12).

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