

APPENDIX A

Nutrient Region Descriptions

I. Willamette and Central Valleys

- Broad, arable, western valleys that are drier and flatter than the neighboring Western Forested Mountains (II)
- Soils are typically nutrient rich and more naturally fertile than those of the adjacent Western Forested Mountains (II)
- Cropland agriculture is the dominant landuse and contrasts with that of surrounding nutrient regions; associated fertilizer use and irrigation return has affected surficial water quality
- Areas of high human population density occur, unlike in most of the Western Forested Mountains (II)

II. Western Forested Mountains

- High relief, mostly forested mountains; they contrast with the agriculturally dominated Willamette and Central Valleys (I) as well as the unwooded Xeric West (III) and the Great Plains Grass and Shrublands (IV)
- Elevational vegetation banding occurs. Highest elevations are wet, low-nutrient, glacially modified alpine areas with locally numerous tarns. High areas are dominated by coniferous forests and contain steep-gradient perennial streams. Deciduous trees become more common at lower elevations and grow with conifers in mixed stands that have a grass understory. Lowest areas are more xeric and can be dominated by shrubland and grassland; however, mountain-fed, perennial streams that are lined by riparian vegetation can be common
- Logging is a common landuse and can strongly affect water quality
- Grazing occurs in the Western Forested Mountains (II) especially on shrublands and grasslands; associated nutrient problems occur
- Relatively small areas of agriculture are found in the Puget Lowland (2), near the Pacific Ocean, and within some mountain valleys

III. Xeric West

- Dry, unforested basins and plateaus with scattered mountains and buttes; the Xeric West (III) is climatically, physiographically, and vegetationally distinct from the Western Forested Mountains (II)
- Xeric West (III) is drier than surrounding nutrient regions
- Perennial streams are rare; those that occur typically originate outside the Region III in the Western Forested Mountains (II)
- Natural vegetation is often desertic and is typically dominated by sagebrush, creosote bush, and grassland; areas of woodland also occur
- Low density grazing is the common landuse of the Xeric West (III); it has affected vegetal cover, surficial water quality, and stream flow characteristics. The landuse mosaic is distinct from that of the Willamette and Central Valleys (I), Western Forested Mountains (II), and South Central Cultivated Great Plains (V)

- Agriculture is found only locally. It is often irrigated, such as in the Imperial, Snake, and Gila valleys, and is characterized by large anthropogenic inputs of nitrogen from artificial fertilizers. Nonirrigated agriculture also occurs, including grain farming in the Palouse
- Locally, areas of high human population density occur along with associated nutrient inputs

IV. Great Plains Grass and Shrublands

- Semiarid high plains with intermittent or ephemeral streams; perennial streams also occur but usually originate in the Western Forested Mountains (II)
- Great Plains Grass and Shrublands (IV) is drier than the Corn Belt and Northern Great Plains (VI) but moister than the Xeric West (III)
- Natural vegetation is short grass prairie and is distinct from that of the Western Forested Mountains (II), the Xeric West (III), and much of the Corn Belt and Northern Great Plains (VI)
- The Great Plains Grass and Shrublands (IV) is composed mostly of grassland and is largely nonarable; cropland is much less common than in the Corn Belt and Northern Great Plains (VI) and the South Central Cultivated Great Plains (V)
- Grazing is the common landuse and has reduced vegetal cover and affected stream quality
- Cropland occurs locally such as in the Northwestern Glaciated Plains (42) ecoregion

V. South Central Cultivated Great Plains

- Part of the Great Plains
- The natural vegetation is mostly grassland and is distinct from that of the Western Forested Mountains (II)
- The South Central Cultivated Great Plains (V) is now mostly cropland that is dominated by sorghum and winter wheat farming; the landuse mosaic is distinct from that of the surrounding nutrient regions
- Dense concentrations of animal feed lots are found in the South Central Cultivated Great Plains (V); associated nutrient problems also occur

VI. Corn Belt and Northern Great Plains

- Rolling glaciated terrain is common; nearly-level, poorly-drained proglacial lakebeds occur locally
- The Corn Belt and Northern Great Plains (VI) is typically covered by nutrient-rich soils that are typically more fertile than those of the Great Plains Grass and Shrublands (IV), Nutrient Poor Largely Glaciated Upper Midwest and Northeast (VIII), and Southeastern Temperate Forested Plains and Hills (IX)
- Soils were derived from glacial drift; alfisols are found in the east while mollisols occur in the west
- The natural vegetation was mostly tall grass prairie and is distinct from that of the Great Plains Grass and Shrublands (IV) and the South Central Cultivated Great Plains (V)
- Today, the Corn Belt and Northern Great Plains (VI) is dominated by cropland agriculture, and extensive corn, soybean, and wheat farming occurs. The landuse mosaic is different from that of surrounding nutrient regions
- Poorly drained areas occur locally and are typically nearly level and clayey; they must be tilled to be arable, and streams are resultantly impacted by severe turbidity problems
- Fertilizers have been extensively applied and nitrates can be found in the ground water
- Locally, feedlots and areas of high human population density occur together with associated nutrient problems.
- Lakes occur locally and are usually eutrophic

VII. Mostly Glaciated Dairy Region

- The Mostly Glaciated Dairy Region (VII) is transitional between the Nutrient Poor Largely Glaciated Upper Midwest and Northeast (VIII) and the Corn Belt and Northern Great Plains (VI)
- Region VII has a mix of nutrient-rich and nutrient-poor soils whereas Region VIII is dominated by relatively thin, nutrient-poor soils and Region VI has nutrient-rich soils
- Region VII contains fewer lakes than Region VIII and more than Region VI
- The lakes of Region VII have varying trophic states while those of Region VIII are typically of better quality
- The length of its growing season is in between that of the cooler Region VIII and the milder Region VI
- The landuse mosaic is dominated by dairying and is generally distinct from that of the Corn Belt and Northern Great Plains (VI); corn farming also occurs like in Region VI but is mostly used for silage
- Dairy cattle are often in close proximity to the region's perennial streams; associated impact on streams and lakes is widespread
- Locally, areas of high human population density and associated nutrient inputs occur

VIII. Nutrient-Poor Largely Glaciated Upper Midwest and Northeast

- The forested Nutrient-Poor Largely Glaciated Upper Midwest and Northeast (VIII) has a high concentration of oligotrophic lakes; lake density and quality is a contrast with those of the Corn Belt and Northern Great Plains (VI) and the Mostly Glaciated Dairy Region (VII)
- Soils are thinner and more nutrient poor than surrounding nutrient regions
- Human population density is low

IX. Southeastern Temperate Forested Plains and Hills

- Irregular plains and hills
- Originally, the Southeastern Temperate Forested Plains and Hills (IX) was mostly forested in contrast to the South Central Cultivated Great Plains (V); areas of savannah and grassland also occurred
- Today, Region IX is a mosaic of forest, cropland, and pasture
- The Southeastern Temperate Forested Plains and Hills (IX) is not as arable as the South Central Cultivated Great Plains (V) or the Corn Belt and Northern Great Plains (VI). However, there is much more cropland than in the Central and Eastern Forest Uplands (XI)
- Lateritic soils are common and are a contrast to the soils of the surrounding nutrient regions
- Areas of depleted soils are found in Region IX and are the result of cotton or tobacco farming
- Major poultry and aquaculture operations are found locally in the Southeastern Temperate Forested Plains and Hills (IX) and associated anthropogenic inputs of nutrients have occurred

X. Texas – Louisiana Coastal and Mississippi Alluvial Plains

- Alluvial and coastal plains
- Alluvial soils are naturally rich in contrast to those of the Southeastern Temperate Forested Plains and Hills (IX); they once supported southern floodplain forest
- Coastal plain soils once supported grassland
- The landuse mosaic of Region X is different from the Great Plains Grass and Shrublands (IV) and the Southeastern Temperate Forested Plains and Hills (IX)
- The dominant landuse of the Texas – Louisiana Coastal and Mississippi Alluvial Plains (X) is cropland agriculture. Cotton, soybeans, rice, sorghum, corn, and wheat are commonly grown

- Fertilizers have been extensively applied and have affected surficial water quality
- Locally, areas of high human population density occur along with associated nutrient inputs

XI. Central and Eastern Forest Uplands

- Mostly forested low mountains and high hills; streams are generally fast moving and are typically clearer than the low gradient streams of the Southeastern Temperate Forested Plains and Hills (IX)
- Scattered areas of intensive agriculture occur, such as in the limestone valleys of the Ridge and Valley (67)
- Major poultry and aquaculture operations are found locally in the Central and Eastern Forest Uplands (XI) along with associated anthropogenic inputs of nutrients

XII. Southern Coastal Plain

- Flat, hot coastal plain that is physiographically distinct from the Southeastern Temperate Forested Plains and Hills (IX)
- Many solution and coastal plain lakes of varying trophic states occur; phosphate deposits locally affect lake quality
- The Southern Coastal Plain (XII) is dominated by extensive areas of citrus orchards and vegetable farming; its landuse mosaic is different from that of the Southeastern Temperate Forested Plains and Hills (IX), the Southern Florida Coastal Plain (XIII), and the Eastern Coastal Plain (XIV)
- Areas of high human population density occur along with associated nutrient inputs

XIII. Southern Florida Coastal Plain

- The Southern Florida Coastal Plain (XIII) is a tropical, nearly level coastal plain with broad wetlands; lakes are much less common than in the Southern Coastal Plain (XII)
- Today, Region XIII is extensively drained for agriculture and sugar cane farming is widespread; its landuse mosaic is distinct from that of the Southern Coastal Plain (XII)
- Locally, areas of high human population density occur along with associated nutrient inputs

XIV. Eastern Coastal Plain

- Coastal plain
- Swampy or marshy areas are found in the southern and central sections and forests grow in the northern portion
- Poorly-drained soils are common in the central and southern portion and nutrient poor soils are found in the northern section
- Cropland is generally limited in extent
- Areas of high human population density occur along with associated nutrient inputs
- Major poultry and aquaculture operations are found locally in the Eastern Coastal Plain (XIV); associated anthropogenic inputs of nutrients have occurred