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Proposed Work, in Three Sessions:

Session One – Modern Economic Impact of the Columbia River Basin

Session Two – The Great Depression and the Construction of Grand Coulee Dam

Session Three – The Indigenous People of the Columbia River Basin

Rationale:

The content of the workshop has application to both of my classes. The vast economic benefits of the aggressive water-management projects along the Columbia and her tributaries are a modern reality. Additionally, the American Federal Government has transformed the region both through policies of “land reclamation” and tribal interaction. While it appears that I have listed these events in reverse order, attacking them in this way is deliberate:

- The student will examine the impressive modern economic basis of the Basin (Economics)
- The student will examine the origins of the current base in the Great Depression and WWII (Economics and Government)
- The student will examine the indigenous culture of the Basin, the native interactions with Federal authorities, and the series of federal actions that removed, denied, and limited Native ancestral claims to the region (Government)

Session One: Document Analysis

Students will read, evaluate, and synthesize data related to the economic impact of several industries within the Basin.

- *Potatoes*
- *Apples*
- *Grains*
- *Wine*
- *Electricity*
- *Forests*
- *Fish and Wildlife*

Inquiry Questions:

What are the costs and benefits associated with the production of each commodity?

For each commodity...

What are two “trade-offs” that are associated with the production of each commodity?

	Costs of Production	Benefits of Production	Trade-Off #1	Trade-Off #2
Potatoes				
Apples				
Grains				
Wine				
Electricity				
Forests				
Fish and Wildlife				

Washington has potato power -- most of it in Columbia Basin

By Kristi Pihl, Tri-City Herald

Whether crispy, greasy, salty, spicy or curly, that french fry you crave likely had its tasty start in the Columbia Basin.

Potatoes grown in the rich soil of Mid-Columbia farms are trucked from fields to one of seven ConAgra Foods Lamb Weston's plants.

The spuds feed into the plants on conveyer belts where topsoil is removed and the potatoes are sized to decide what fry they should become, or if they should be hash browns, tater tots or other potato products.

"Every potato delivered to this facility has an end use," said John Blair, operations manager for the Richland and Pasco Lamb Weston plants.

Each year, 11 billion potatoes from Columbia Basin fields head to the seven Lamb Weston plants in Warden, Connell, Pasco, Richland, Quincy, Boardman and Hermiston.

That's enough potatoes to fill 350 football fields 6 feet deep.

To process all of them, Lamb Weston employs about 4,300 people in full-time, year-round jobs, Blair said.

"The Columbia Basin region is the prime growing region in the world for growing potatoes," Blair said, noting the Columbia Basin has the highest concentration of Lamb Weston's 20 plants worldwide.

The region's temperature, soil and available water make it a good place to grow spuds, he said.

Nationwide, Washington grows the second-largest volume of potatoes, accounting for about 21 percent of total U.S. production, according to the Washington State Potato Commission. Idaho grows the most at about 28 percent.

But Washington farmers grow more potatoes per acre than anywhere in the world. The national average is about 397 sacks per acre, but Washington farms get an average of 615 of the 100-pound sacks, and some fields can get more than 1,000.

About 87 percent of Washington's crop is sold to processors, said Ryan Holterhoff, the Washington State Potato Commission's director of marketing and industry affairs.

"Processors are able to transform Washington potatoes into golden fries, crunchy chips and creamy mashed potatoes that the world can enjoy," he said.

Potatoes are Washington's third most valuable crop, behind apples and wheat.

The potato industry generates \$4.6 billion for the state economy and creates 23,500 jobs, according to the commission.

Lamb Weston, ConAgra Foods' largest brand, is the largest potato processor in Washington, and one of the largest global producers. But there are many other processors and fresh packers in the region, such as Twin City Foods, Baker Produce, Agri-Pack and Balcom & Moe.

The season's first potatoes usually come out of the ground in July. By September, potato harvest is just starting to hit its full swing, Holterhoff said.

Lamb Weston's Richland plant runs 24/7 to keep up with the demand for processed potato products.

The plants run year-round, typically with 13 days on, and then a day off for maintenance and cleanup, Blair said.

Lamb Weston's fries are available in 100 countries.

Washington is Producing Apple Crop in Quantity

Washington is harvesting what is likely to be the state's largest apple crop, using advanced technology and economies of scale that may make the family-run orchard a thing of the past here as well as in other apple-growing regions in New York and Michigan.

The Columbia River Basin, in the relatively isolated central part of the state, is being converted from wheat and row-crop agriculture to more lucrative crops like apples by corporate farmers that are reaping increased profits from huge orchards.

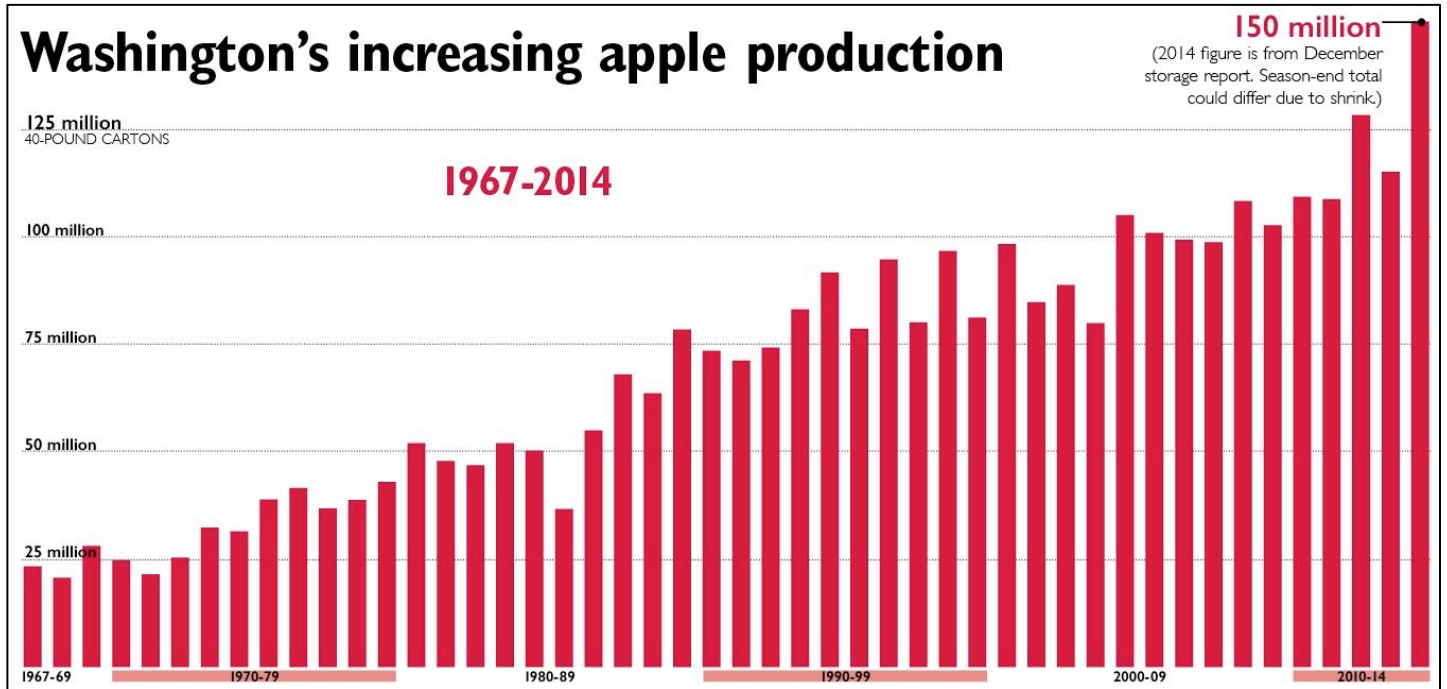
Dozens of young orchards 250 acres and larger have been planted by large fruit packers since the early 1990's. In some areas of the basin, orchards have been planted 1,000 acres at a time. The orchards can grow apples, especially the premier Red Delicious, better and cheaper than orchards in other areas of the state, certainly better than other areas of the country, because of the dry pest-free climate, rich volcanic soils and abundant water from the Grand Coulee Dam.

Washington already produces more than half of the nation's apples. The United States Apple Association estimates that the state will produce 94 million 42-pound boxes of freshly packed apples in the current harvest, which runs from late August to early November. In 1994, the state produced 92 million boxes. New York, the No. 2 apple state, is expected to produce 26 million boxes.

"Efficiency is the key," said Karen Maib, an extension agent, who is the local adviser to tree-fruit growers and who works for Washington State University. "It comes through good management and economies of scale."

Orchards make up 50,000 acres of the basin, Ms. Maib said. Nearly all the orchards are planted to the latest Red Delicious strains or to varieties like Fuji, Braeburn and Gala.

"There isn't an apple-growing region in the world that isn't affected by how things are done here," Ms. Maib said. "This is a showplace for a lot of people. They come here to see how it's done."



Source: Washington's increasing apple production since 1967. Source: Washington Growers Clearing House Association and Washington State Tree Fruit Association.

Washington State Grain Production, 2007-2016

Note: Quality Reports

Every year, U.S. Wheat Associates (USW) produces Crop Quality Reports that include grade, flour and baking data for all six U.S. wheat classes. The reports are compiled from sample testing and analysis conducted during and after harvest. The reports provide helpful information to buyers as they specify their needs to get the best value in their purchase contracts. USW shares the data with customers in person or at a series of annual Crop Quality Seminars around the world from September through December.

Year	Harvested Acres	Yield Bushels/Acre	Production in Bushels	Marketing Yr Avg Price/Bushel	Value of Production
2007	2,137,000	58.7	125,342,000	\$7.58	\$949,132,000
2008	2,305,000	52.8	121,590,000	\$6.26	\$762,187,000
2009	2,265,000	54.6	123,765,000	\$4.85	\$597,381,000
2010	2,275,000	64.9	147,540,000	\$6.24	\$921,989,000
2011	2,335,000	70.9	165,530,000	\$6.78	\$1,122,409,000
2012	2,145,000	66.6	144,125,000	\$8.07	\$1,162,209,000
2013	2,175,000	66.9	145,530,000	\$6.95	\$1,014,032,000
2014	2,250,000	48.2	108,460,000	\$6.55	\$714,858,000
2015	2,215,000	50.4	111,540,000	\$5.35	\$629,124,000
2016	2,200,000	71.5	157,290,000	N/A	N/A

Source: Washington Grain Commission, 2016. Wheat Production and Quality, at <http://wagrains.org/buyers-processors/wheat-production-quality/>

Wine Production in Washington State

The Washington State Wine Commission has released an economic impact study of Washington's wine industry. In 2013, the industry's total economic impact was \$4.8 billion in business revenues and it paid \$61.9 million in state taxes.

(To put that in perspective, according to a study of the apple industry, its economic impact was \$7.5 billion in 2013.)

The report also looks at the wine industry's impacts on four counties:

- In Benton County, which produces the most cases of wine, wine production and related activities generated 3,170 jobs and \$885.7 million in revenues (including direct, indirect and induced effects).
- In King County, the industry supported 3,740 jobs and \$672.5 million in revenues.
- In Walla Walla County, 1,920 jobs and \$447.7 million in revenues were tied to the wine industry.
- In Yakima County, the industry generated 490 jobs and \$126.7 million in revenues. (The study notes that this "understates the county's importance to the state wine ecosystem; Yakima grapes are essential to the activities of counties with concentrations of wineries.")

Washington is the nation's second largest producer of wine grapes, with 4 percent of the national total. (California produces 85 percent.) In 2013, 64.4 percent of Washington's wineries sold fewer than 1,000 cases. One winery sold over one million cases.

Washington has many advantages as a place to produce wine. As the study notes, . . . the wines produced in Washington have a high quality-to-price-ratio, according to interviewees. Largely thanks to relatively low land prices, vineyard owners are able to produce quality grapes at a lower price point than the state's chief competitors.

Despite that, of wine sales in Washington in 2014, only 23.6 percent were Washington wines (76.4 percent were imported from out of state).

Source: Washington Research Council, 2014. At

<https://researchcouncil.org/2015/09/18/washingtons-wine-industry-has-48-billion-economic-impact>

Washington State Energy Profile: Electricity

Note: The Grand Coulee Dam on Washington's Columbia River is the largest hydroelectric power producer in the United States, with a total generating capacity of 6,809 megawatts.

Washington is the leading U.S. producer of hydroelectric power, routinely contributing more than one-fourth of the nation's total net hydroelectric generation. Eight of the state's 10 largest power plants are hydroelectric facilities, and most of them are located on the Columbia River. One of them, Grand Coulee, is the seventh largest power plant in the world and the world's sixth largest hydroelectric plant. The largest hydroelectric facilities in the state are, at more than 60 years of age, among the oldest generating facilities in the nation. Those facilities were built by federal entities that continue to own or operate them. The Bonneville Power Administration, one of four federal power marketing administrations, is the marketer of electricity produced at the federal dams in Washington. Hydroelectric power typically accounts for between two-thirds and four-fifths of Washington's electricity generation, providing abundant and inexpensive electricity to the region.

Net electricity generation usually exceeds retail electricity sales in Washington. Because of its significant hydroelectric generating capacity, the state is an exporter of electricity to the Canadian power grid and supplies U.S. markets as far away as California and the Southwest. Large amounts of hydroelectric power leave Washington via the Western Interconnection, which runs from British Columbia and Alberta, Canada, through Washington and Oregon to southern California and the northern part of Baja California, Mexico. The entire system covers all or parts of 14 states. Because of the relatively low operating costs of hydroelectric power generation, the state has the lowest average retail electricity prices in the nation. More than half of all Washington households are heated with electricity.

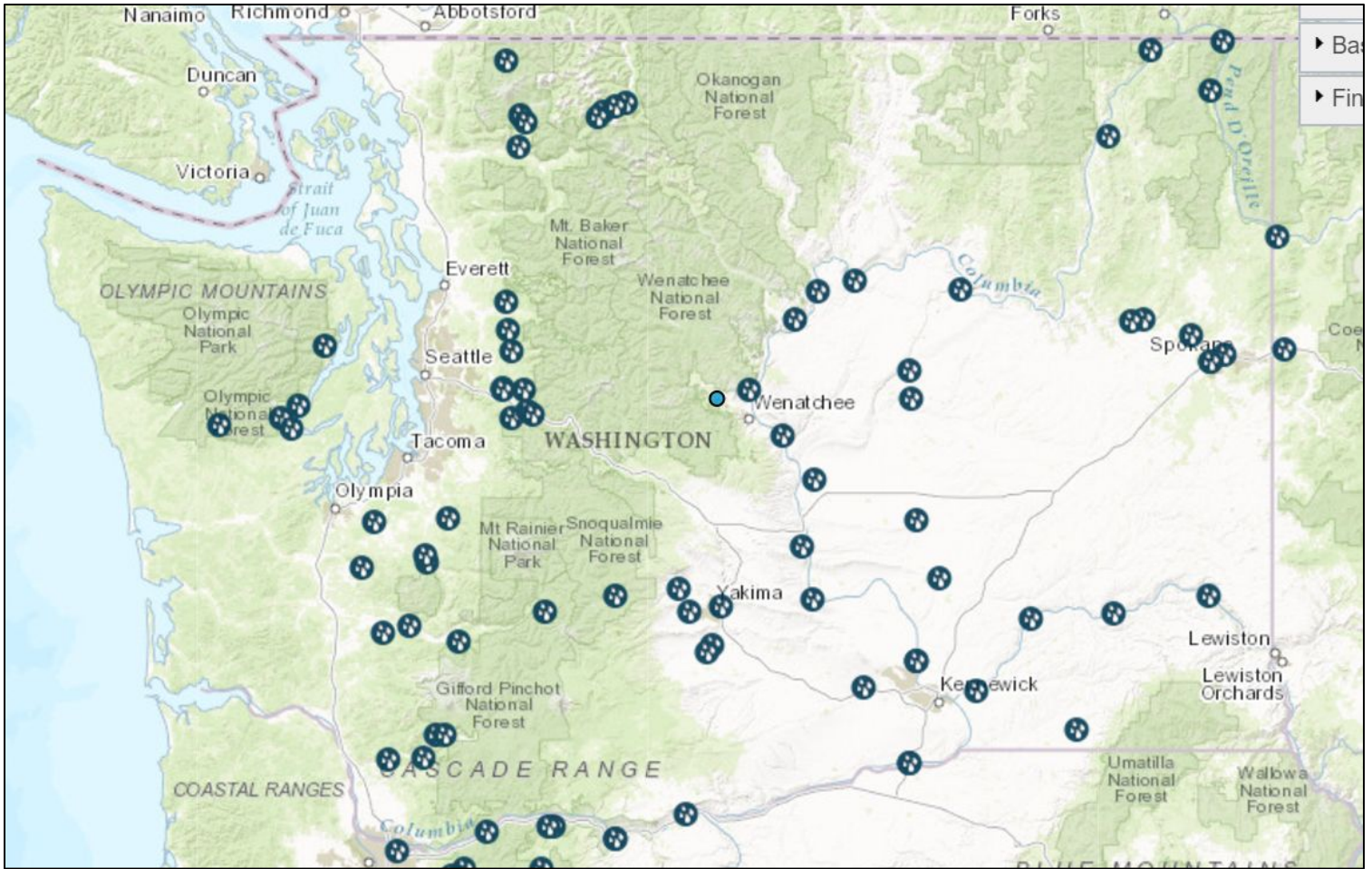
Source: U.S. Energy Information Administration, 2015, at <https://www.eia.gov/state/print.php?sid=WA>

**Table 7.1 Washington State Electricity Overview
(Billion Kilowatt-hours)**

	Net Generation ^a			Total
	Electric Power Sector ^b	Commercial Sector ^c	Industrial Sector ^d	
1950 Total	329	NA	5	334
1955 Total	547	NA	3	550
1960 Total	756	NA	4	759
1965 Total	1,055	NA	3	1,058
1970 Total	1,532	NA	3	1,535
1975 Total	1,918	NA	3	1,921
1980 Total	2,286	NA	3	2,290
1985 Total	2,470	NA	3	2,473
1990 Total	2,901	6	^c 131	3,038
1995 Total	3,194	8	151	3,353
2000 Total	3,638	8	157	3,802
2001 Total	3,580	7	149	3,737
2002 Total	3,698	7	153	3,858
2003 Total	3,721	7	155	3,883
2004 Total	3,808	8	154	3,971
2005 Total	3,902	8	145	4,055
2006 Total	3,908	8	148	4,065
2007 Total	4,005	8	143	4,157
2008 Total	3,974	8	137	4,119
2009 Total	3,810	8	132	3,950
2010 Total	3,972	9	144	4,125
2011 Total	3,948	10	142	4,100
2012 Total	3,890	11	146	4,048
2013 Total	3,904	12	150	4,066
2014 Total	3,937	13	144	4,094

Source: https://www.eia.gov/totalenergy/data/monthly/pdf/sec7_3.pdf

Locations: Washington State Hydroelectric Dams



0 25 50 100 Miles

- | | | |
|--------------------------|----------------------------------|-------------------------------|
| ■ Mask | ⊗ Hydroelectric Power Plant | ⊕ Pumped Storage Power Plant |
| ▲ Surface Coal Mine | ⊖ Natural Gas Power Plant | ☀ Solar Power Plant |
| ▼ Underground Coal Mine | ⊙ Nuclear Power Plant | ⊙ Wind Power Plant |
| ⊙ Biomass Power Plant | ● Other Power Plant | ⊙ Wood Power Plant |
| ⊙ Coal Power Plant | ⊙ Other Fossil Gases Power Plant | ⊙ Petroleum Refinery |
| ⊙ Geothermal Power Plant | ⊙ Petroleum Power Plant | ⊙ Strategic Petroleum Reserve |

Source: U.S. Energy Information Administration, 2015, <https://www.eia.gov/state/maps.php?v=Hydroelectric>

Forest Product Overview: Washington State

Forest Product Sector Defined

The industry consists of companies engaged in operating timber tracts, nurseries, seeding reforestation and harvesting timber and other forest products. The industry also includes related services such as cutting, logging, transporting, estimating and other forest management services. Products include lumber, plywood, flake board, chips, sawdust, wood flooring shingles, tiles, millwork laminated veneer, fencing and other primary wood products. Factoring in pulp and paper and value-added wood products (such as doors, window frames and stairs), makes forest products the third-largest manufacturing sector in the state of Washington.

Impacts of the Forest Products Sector in Washington

Throughout our state, more than 1,700 businesses are related to forest products. The overall direct, indirect and induced jobs impact numbers for 2013 is 105,000 workers, earning \$4.9 billion in wages. This represents 3 percent of the total wages paid in Washington State. Gross business income in forestry-related industries is approximately \$28 billion per year, with \$175 million paid in state and local taxes. According to a report by the Washington State Employment Security Department, more than 10 percent of forestry-related jobs are “green”, compared to about 3 percent for the state economy as a whole.

Source: Washington State Department of Commerce, at <http://www.commerce.wa.gov/growing-the-economy/key-sectors/forest-products/>

Fish and Wildlife Generate Billions for Washington's Economy

Fishers, hunters and wildlife watchers contribute more than \$6.7 billion a year to Washington state's economy. Many of the dollars they spend support small businesses and rural communities, keeping cash registers ringing in restaurants, gas stations, convenience stores and sporting goods outlets

More than one million people go fishing or hunting each year in Washington, buying meals and snacks, booking motel rooms, filling their gas tanks, chartering boats or hiring guides, and purchasing an array of outdoor gear. Commercial fishers, meanwhile, harvest catches totaling \$3.8 billion by the time they are processed, distributed through wholesalers, sold in the retail market or served in restaurants. The Washington Department of Fish and Wildlife (WDFW) is the agency responsible for protecting and managing the state's fish and wildlife populations—and providing opportunities for recreational and commercial fishing, wildlife viewing and hunting. A team of some 1,550 WDFW employees across the state—biologists, lab technicians, enforcement officers, hatchery workers, land stewards, customer-service staff, business managers and others—manage Washington's fish and wildlife and provide opportunities to view or sustainably harvest them.

<i>Fish and Wildlife Activities</i>	<i>Annual Economic Activity</i>	<i>Associated Jobs</i>
<i>Hunting</i>	\$313 million	5,595 jobs
<i>Sport Fishing</i>	\$1.1 billion	14,655 jobs
<i>Wildlife Watching</i>	\$1.5 billion	26,000 jobs
<i>Commercial Harvest</i>	\$1.4 billion	14,000 jobs
<i>Total (N)</i>	\$4.5 billion	60,250 jobs

Source: Washington Department of Fish and Wildlife, 2014, at <http://wdfw.wa.gov/publications/00570/wdfw00570.pdf>

Group Discussion:

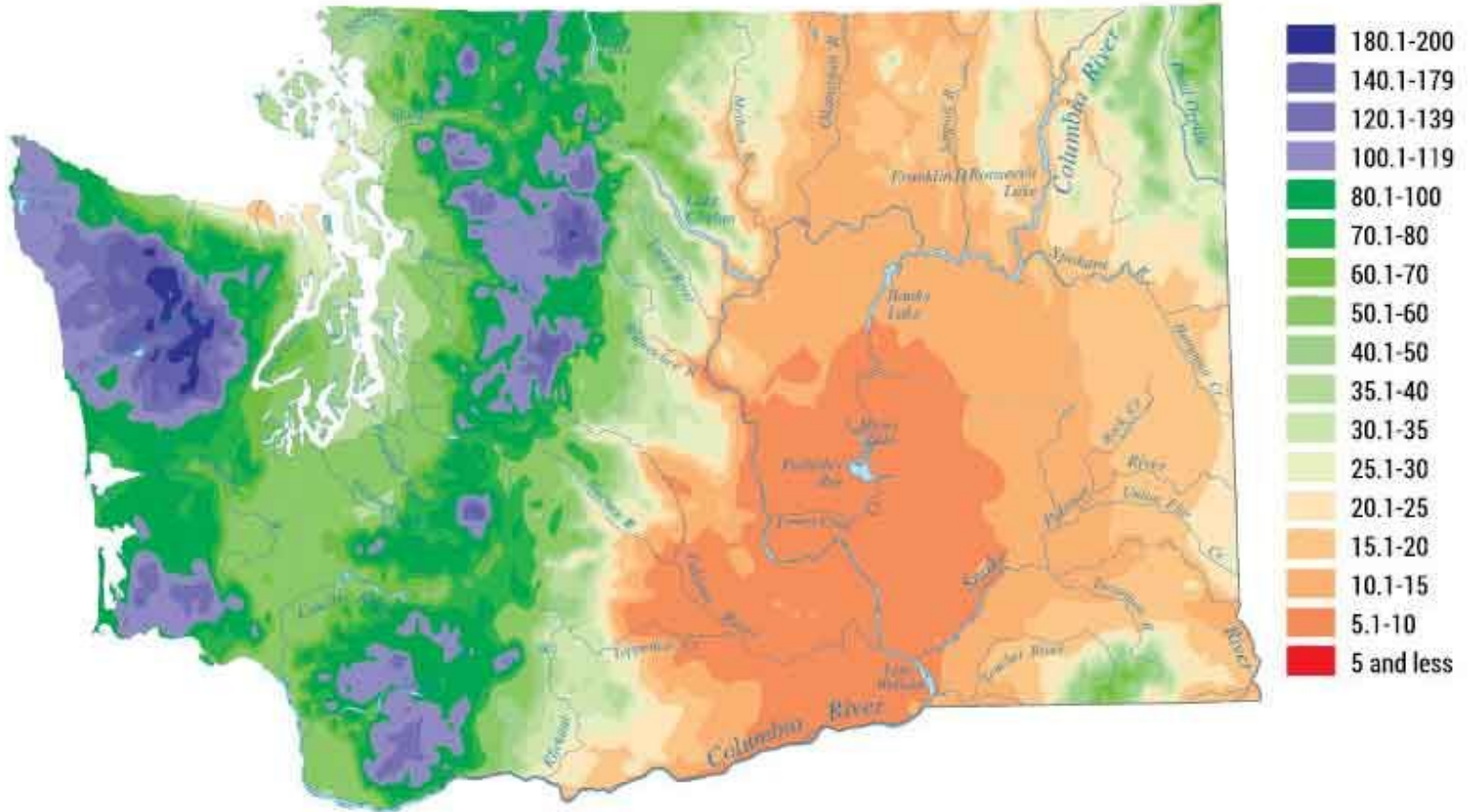
Look at the following map. What are the geographic features of the state? What industries and/or commodities might be grown in each region?



Source: <http://geology.com/lakes-rivers-water/washington.shtml>

Group Discussion:

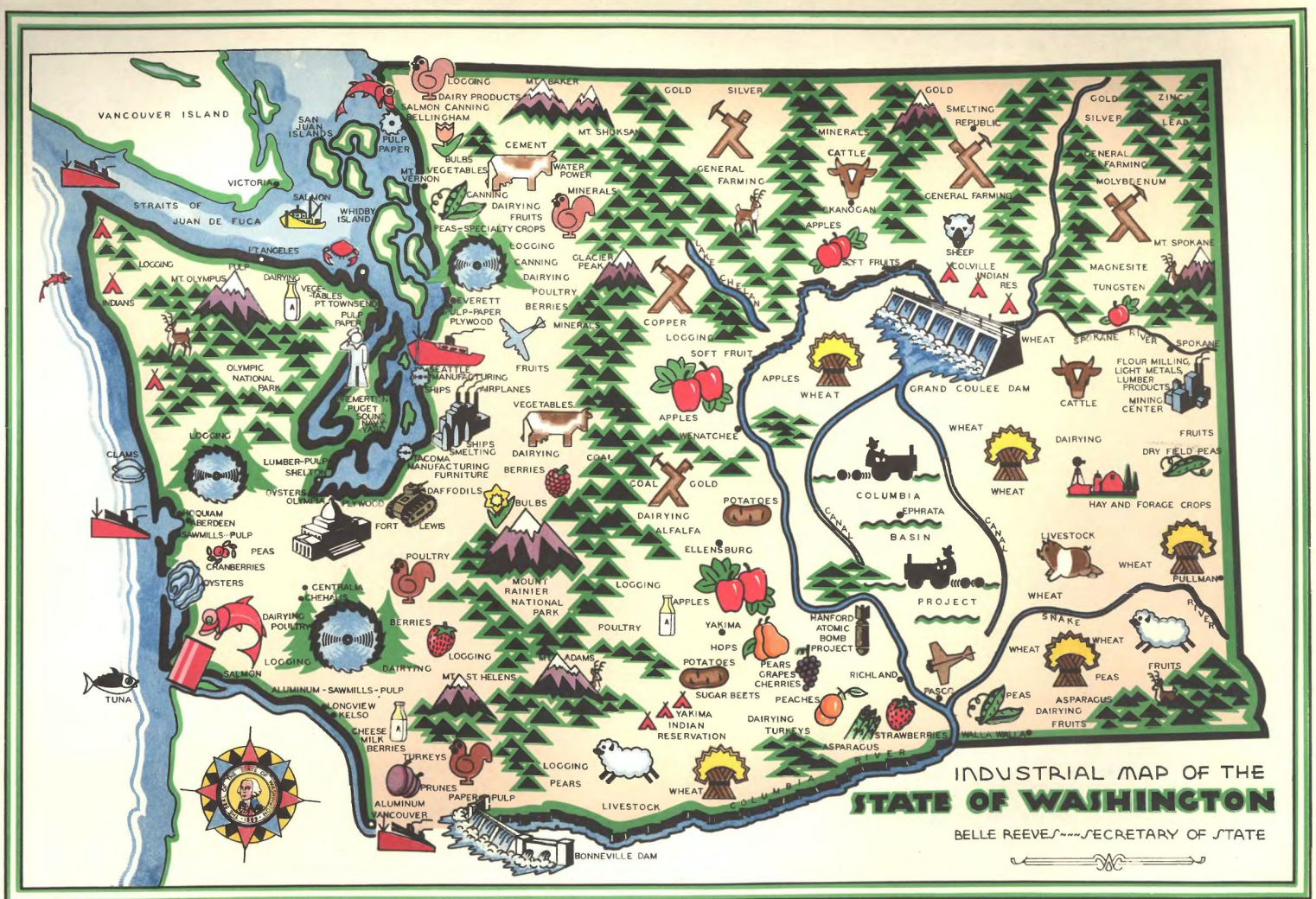
Look at the following map. What effect might rainfall have the production of commodities within the state?



Source: Annual Precipitation, at <http://choosewashingtonstate.com/research-resources/about-washington/climate-geography/>

Group Discussion:

Look at the following map. How has the implementation of irrigation and hydroelectric power altered the productivity of commodities within the state?



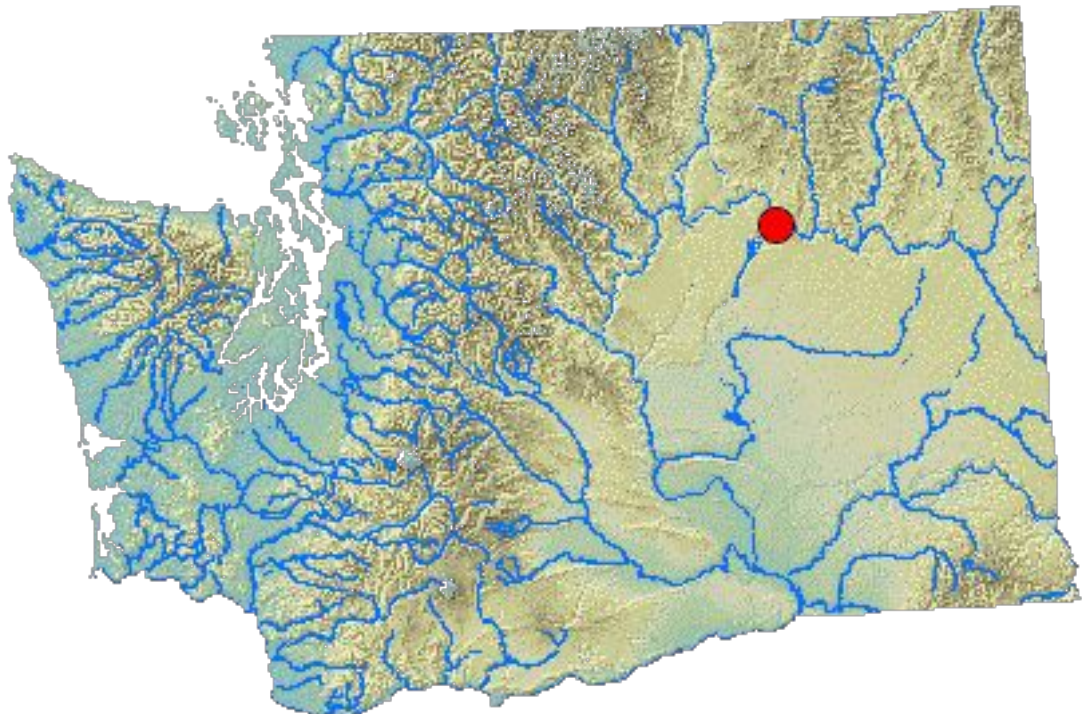
Source: Industrial Map of the State of Washington, at https://www.sos.wa.gov/legacy/maps/maps_detail.aspx?m=19

Grand Coulee Dam Washington State



Photograph by Gregg M Erickson, 2009. CC BY 3.0

<https://osu.pb.unizin.org/sciencebites/chapter/environmental-impacts-of-the-grand-coulee-hydroelectric-dam/>



[The
Grand
Coulee](#)

[Map](#)