

November, 2008

- Provide a brief description of the community surveyed, including the population, and transient population, geographic location, climate and annual rainfall.*

Geography

Benton County, one of the smallest counties in the state, is located in the Willamette Valley about 85 miles south of Portland. It is bordered on the north by Polk County, on the east by Linn County, on the west by Lincoln County and on the south by Lane County. It covers 676.46 square miles, of which 3 square miles are water, and stretches from the Willamette River on the east to the summit of the Coast Range on the west. The majority of the land is forested with 56.7% zoned for forestry. Seventy-six percent of the land is in private ownership, with the remaining owned by BLM (14%), the State (5%), the US Forest Service (4%) and other (2%).

Benton County has five incorporated cities: Corvallis, the county seat, with over 62% of the total population; and Adair Village, Monroe, Philomath, and Albany (only North Albany is in Benton County). Approximately 65.7% of the population lives within the 5% of the county designated as urban. The remaining live in rural areas or in the unincorporated towns of Alsea, Alpine, Bellfountain, Blodgett, Kings Valley and Wren.

Demographics

Population data for the period from 1990 to 2006 (estimated) is listed in the table below.

	2006	2005	2000	1990
Adair	920	905	536	554
Corvallis*	53900	53165	49322	44757
Monroe	610	610	607	448
Philomath	4460	4400	3838	2983
Benton County	84125	82835	78053	70811

* Oregon State University is located in Corvallis. In 2008, approximately 20,000 students were enrolled at OSU during the regular school year, with over 6600 attending summer school.

According to the U.S Census Bureau, Benton County's population grew 1.2% from 2000 to 2006, compared to 8.2% growth statewide.

In 2006, the Census Bureau estimated that there were 34,883 housing units in Benton County. The ownership rate is calculated at 57.3%, compared to 64.3% statewide, with the lower rate probably attributable to the large number of transient students. Population density for the county is estimated to be 124 people per square mile.

Economy

Benton County has long depended upon the fertile lands of the Willamette Valley for an agriculture-based economy. Grass and specialty seeds, Christmas trees, dairy and sheep, lumber and paper are mainstays of the economy. High technology, anchored by Hewlett-Packard and over 25 software firms, regional medical facilities, an emerging wine industry and Oregon State University add to the diversity of the economy. The top five employers in Corvallis are Oregon State University, Hewlett-Packard, Good Samaritan Regional Center, Corvallis Clinic and CH2MHill.

Benton County is considered unique in Oregon as it was the second slowest growing metropolitan area in Oregon during the 2001-2005 period, with a decline in manufacturing jobs. On the other hand, it also has experienced the lowest unemployment rate in Oregon for thirteen years, and has the third highest per capita personal income rate - \$33,988 in 2004. The high education level is considered to be the primary factor in explaining these seemingly contradictory numbers. According to the 2000 Census, 47.4% of the population age 25 or older had a bachelor's or higher degree, compared to the statewide average of 25.1%.

Climate

The climate is characterized by cool, wet winters and warm dry summers, often referred to as a Mediterranean climate. Rainfall amounts vary throughout the county, with elevation being the primary cause for the differences. About 50% of the average annual rainfall arrives between December and February, with little occurring during the summer. Precipitation in the form of snow occurs each year, again with higher amounts falling at higher elevations. Average precipitation amounts at the Oregon State University recording station are 42.670 inches of rain with 4.9 inches of snow. The Corvallis Water Bureau, at 2277 feet above sea level, averages 67.76 inches rain and 7.7 inches snow.

The average temperature in January is 39.3; in July, 65.5.

2. ***Identify the major watersheds and subwatersheds in which you live. Describe the uses of the water resources in that community (i.e., recreational, agricultural, industrial, residential, and ecological.) Have major pollutant concerns been identified (sediment/turbidity, mercury, temperature, bacteria, etc.)?***

Watersheds/Subwatersheds

The major watersheds in Benton County include the Willamette, Marys, Luckiamute, Alsea, and Long Tom Rivers. The subwatersheds that are located within the City of Corvallis include the following:

- 1) Willamette River Watershed – Dixon, Frazier, Garfield, Jackson, and Sequoia Creeks
- 2) Marys River Watershed – Dunawi and Oak Creeks, and Mill Race

The city adopted its Watershed Stewardship Plan on December 18, 2006.

Watershed Councils

Currently four watersheds have established watershed councils: Alsea, Long Tom, Luckiamute, and Marys River, with Marys River being especially active in local water issues.

Uses

Drinking water: The Willamette River provides two-thirds of the municipal water supply for the City of Corvallis, while Rock Creek (part of the Marys River watershed that is located in Benton County), supplies one-third. The Marys River is the source of drinking water for the City of Philomath, while the Willamette River supplies drinking water for Adair Village. North Albany draws its water from the Santiam River, and Monroe currently uses groundwater, but a water treatment facility drawing water from the Long Tom River will be completed in 2009.

Sewage Drainage: All sewage from the City of Corvallis is treated prior to release into the Willamette River, except during the strongest rains. (See page 5, "Storm Water".) Treated sewage from Philomath is released into the Marys River.

Stormwater Drainage: One-third of the stormwater that enters the Willamette from the City of Corvallis is treated prior to release, while two-thirds is untreated. In all other Benton County communities, the stormwater enters the rivers and streams untreated.

Recreational: Recreational uses of the Willamette and Marys River include boating and fishing.

Agricultural: Rivers and streams in Benton County that run through agricultural land are used for both irrigation and drainage.

Industrial: Two major industrial concerns are located in Corvallis: Hewlett Packard and Evanite Corporation. Approximately one million gallons of water are used daily by the Hewlett-Packard (HP) plant for cleaning computer wafers.

Ecological: The water resources within Benton County support aquatic and terrestrial wildlife through both habitat and as a source of drinking water. They also support native plant communities within wetlands, oak savannas, and forests.

Pollutant Concerns:

Riparian

Temperature: The US EPA has cited the City of Corvallis for release of treated sewage water into the Willamette River that exceeds acceptable levels for supporting native cold-water fish.

Sediment: A significant amount of sediment is deposited into rivers and streams with stormwater runoff from a variety of sources.

Chemicals: Toxic chemicals from non-point sources are present in both stormwater and treated sewage released into Benton County’s rivers and streams. This includes chemicals from pharmaceuticals that are not broken down during the treatment process. There are 36 DEQ-listed contaminants in the stormwater runoff from City of Philomath that drains into the Marys River.

Bacteria: There is a variety of harmful bacteria present in local waterways, primarily *E. coli* from stormwater runoff and *Giardia*, which is present in the Willamette River in very low concentrations. In addition, harmful bacteria may enter surface and groundwater from faulty or poorly maintained septic systems.

Litter: Litter enters rivers and streams through stormwater channels.

Nitrate Contamination

Parts of Benton County are included in the Southern Willamette Valley Groundwater Management Area as the presence of nitrates in the groundwater above 7.0 milligrams per liter were confirmed after several years of study. An Action Plan for the area was approved in November 2006 to restore groundwater quality and actions have been taken to implement the plan, including voluntary well monitoring, outreach and education.

Other: Arsenic, dissolved solids, and sulfur salts are prevalent near the Willamette River in Monroe, in Bellfountain, and in North Albany. Often, the deeper the well, the greater the concentration of arsenic.

3. Which organization or organizations provide the drinking water and what are the sources of that drinking water? What percentage of the population draws water from private wells?

Drinking Water in Benton County

Providers	Source of drinking water
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City of Corvallis	North and South Forks of Rock Creek & Griffin Creek (on east flank of Marys Peak) and the Willamette River
City of Philomath	Marys River
City of Adair Village	Willamette River
City of Monroe	Groundwater, but in 2009 – Long Tom River
City of Albany (only North Albany in Benton County)	Santiam River
Benton County 90 Active Benton County Water Systems - 15,000 Private Wells	Ground water. (Serving population of ~6000)

4. Describe briefly the characteristics of the water, stormwater, and wastewater treatment utilities (number of users being served, projected growth, facilities maintained, cost to users, etc.).

CITY OF CORVALLIS

Drinking Water

Supply: The City has water rights to take 25 CFS (cubic feet per second) per day from the Willamette River which is estimated to be enough water to serve up to a population of 120,000. This permit must be renewed every 5 years. Rock Creek supplies 2 to 2 ½ MGD (million gallons per day) and the rest is from the Willamette River.

Use: There are 16,000 connections to the water utility (pop. 55,000). Use is 5-6 MGD in winter, 13 MGD in summer. Approximately 60% of the water goes to residential use; 40% to commercial and school (non-residential) use.

Facilities: The City runs two water treatment plants, Rock Creek and Taylor. In 2007 2.76 billion gallons of water were treated, 32% (879 million gallons) at Rock Creek and 68% (1.88 billion gallons) at Taylor (Willamette River). At peak production, the Rock Creek Treatment Plant can supply 3 (MGD) and Taylor can supply 21 MGD. Both plants are “conventional” four-step process plants.

Water is distributed through 257 miles of pipes, 8 covered storage reservoirs (capacity 23 million gallons), and ten pumping stations. It is pumped to tanks at higher elevations and flows to most users by gravity.

Management: Water facilities are managed by the Utilities Division, Department of Public Works.

Safety: City water fulfills all EPA safety requirements. Automated water quality monitoring is continuous. Sampling by a Water Quality Lab is routine. Chlorine, fluoride and alum are added before distribution. Solids from settling ponds are spread on land owned by the city and no solids are returned to the river.

Cost: First level rate is \$1.20 for 748 gallons (1 hcf)¹ of water. Users at elevations requiring pumping pay more, and those exceeding set thresholds pay a higher rate. Average cost is \$0.0035/gallon

Conservation: Average indoor water use in Corvallis is about 66 gallons per person per day. Water users exceeding set thresholds pay higher rates. The City offers water audits on request and includes conservation tips on its website and in its annual *Water Quality Report*. Rebates (though not highly publicized) are available for installation of qualifying toilets and washing machines.

Storm Water

Facilities: The stormwater infrastructure consists of 167 miles of storm water pipe (1/3 of Corvallis has combined sewer and storm drain pipes); 2,725 manholes; 20 storm water detention facilities; 8,000 catch basins; 14 storm water treatment facilities; 279 storm water outfalls; 14 miles of urban streams.

Management: In 2007 a Storm Water Management Program Plan (SWMPP) was adopted in compliance with EPA's National Pollution Discharge Elimination System (NPDES) Phase II which has a five year implementation schedule. The Department of Public Works performs maintenance activities to minimize the impacts of storms on the community which include pipe inspection, catch basin cleaning, and clearing channels.

Safety: Two-thirds of the City's storm water pipes drain untreated into eight local streams plus two rivers. Water samples from these streams are tested each month. There is a need to balance the need for flood control with the desire to maintain urban streams for fish and wildlife habitat.

One-third of the City's storm water system is combined with the City's wastewater system and transported to the City's wastewater treatment plant.

Cost: A fixed fee based on the amount of impervious surface area serviced is charged on the monthly utility bill, currently \$5 for a single family home.

Waste Water

Amount: The City of Corvallis processes 10 million gallons of wastewater per day (4 billion gallons per year). Hewlett Packard removes metals from the million gallons a day of wastewater it contributes. Over the last 12 months, Allied Waste delivered more than 28 million gallons of leachate water for treatment. This works out to an average of 77,000 gallons per day; however, the actual number of gallons varies widely during the year, depending upon the season, with more delivered during the wet, rainy season.

Management: Corvallis Public Works Department operates plant 24 hrs/day, 7 days a week.

Facility: The wastewater treatment plant is in the Willamette River floodplain at the confluence of Dixon Creek. About 98% of waste is removed before the water enters the Willamette River. After treatment of sewage, organisms settle out along with particulate matter into sludge which is sent to a "digester". A percentage of the methane produced by the digester is used by the City for heating. Then the sludge goes to OSU lands on Soap Creek Road (1970, April). The plant's capacity is 28,000,000 gal/day which will serve a population of 120,000.

Safety: City monitors 155 different categories of contaminants (80,000 chemicals can be found in wastewater). An education program resulted in 90% reduction of mercury in the wastewater. There is currently no testing for hormones and pharmaceuticals.

¹ Hcf = 1 unit = 100 cubic foot = 748 gallons

Because of combined sewer/storm water pipes, 1/10 inch of rain may overflow the main wastewater treatment plant, causing the excess to divert to an adjacent treatment facility; but over one inch may cause overflow of this plant into the Willamette River. In 2007, 248 million gallons received minimal treatment, and 2.8 million gallons received no treatment and was drained directly into the Willamette River (permitted by Oregon DEQ).

The wastewater plant is at risk of flooding (occurred in 1996) which may cause sewage to spill into the river. There are plans for dealing with such flooding.

Cost: The electric bill for the wastewater plant is currently \$250,800/year. The city plans to install solar collectors to produce 50% of power needed. Wastewater Utility charges are \$2.83 per hcl.

Future Issue: As the population reaches “built-out” level, there are concerns that the “thermal load” of the effluent that goes into the Willamette River will kill aquatic life. The City is considering options for dealing with this: (1) cool output to river through refrigeration, or (2) divert the water from the river by building a 16-mile pipe to the south for use on grass-seed farms, or (3) reuse the treated water in Corvallis for non-potable purposes.

OTHER JURISDICTIONS

Each incorporated city is responsible for its own water supply and water treatment facilities. Because the majority of the county residents and League members live in Corvallis, we chose to research the city.

BENTON COUNTY

Water Supplies

Rural residents are supplied with water through 15,000 private wells, 90 public/private well systems and county service districts. The county service districts providing water are Cascade View and Alsea. In addition, Alpine and South Third (still in project development stage) county service districts provide sewer services. As part of the Benton County Water Supply district, the density of domestic wells at the section level has been plotted and mapped. According to this map, the largest density of private domestic wells are located west and north of Corvallis, where there has been extensive building over the last several years.

Recently county commissioners developed amendments to the County Code specifying water quantity requirements including water availability, sustainability of aquifers and non-interference with nearby users before housing permits would be given for subdivisions, lots and partitions.

There are no current requirements for monitoring existing private wells except at time of development, selling or transfer of property. At those times, wells must be tested to ensure at least five gallons per minute of potable water as well as the absence of coliforms.

Waste Water

The majority of rural residents are on septic systems. Benton County’s permit process includes two steps: a site feasibility study and a construction installation permit from the Environmental Health division.

Benton County Water Project

In 2007, Benton County Commissioners initiated a Water Supply Project in collaboration with watershed councils, irrigation districts, private water utilities, Oregon Water Resources Department, local businesses, Oregon State University’s Institute for Water and Watersheds and other stakeholders.

The purpose of this project is “to help Benton County plan for a sustainable water supply across the region.” A technical team is developing reliable forecasts and data about the water supply and future demands, and an outreach and education team is charged with disseminating this information. Committee reports and resources are posted to the county’s website

Q 5: What other issues or significant concerns came to light during your research?

- The number and quality of exempt wells in the County
- Unknown impacts of global climate change
- Potential effects of increased population and development
- Infrastructure costs for treatment facilities, including the identification of new pollutants (microconstituents, including pharmaceuticals). (Refer to Appendix 1)
- Increased thermal load and nutrient load on the Willamette River

Appendix 1: Anticipated Costs: Benton County Water Infrastructures

Benton County Budget

- Antiquated System/facility (O&M)
 - Needed by 2009
 - Alsea Service District Storm Water Drainage, \$300,000
- State/Federal Regulation Compliance
 - Needed by 2009
 - Alpine Service District Dechlorination Project, \$300,000

City of Corvallis Budget

- Operation and maintenance: capital investments
 - Water Service: O&M, \$7 million; Capital, \$6 ½ million
 - Includes Taylor Treatment Plant and Rock Creek Reservoir & Treatment Plant Distribution
 - Sanitary Sewer Service: O&M, \$6 ½ million; Capital \$6 ¾ million
 - Includes collection system, wastewater treatment and CSO
 - Stormwater Service: O&M, \$1 ¾ million; Capital, \$1 ½ million
 - Includes systems to collect stormwater run-off
- State/Federal Regulation compliance
 - Needed by 20134, \$25 million
 - Includes wastewater effluent reuse

Adair City

- Antiquated System/facility
 - Needed by 2009
 - Includes: new water membrane facility, \$4 ¼ million
 - Rebuild water intake pump station, \$214,755
 - Raw water pump station building, \$56,880
 - Pipe replacement, \$1,800,000
 - Needed by 2010 to 2015
 - Includes: water surface pump replacement: \$172,360
 - Replacement of Voss Hill stand pipes, \$2 ½ million
 - Transmission pipes from Voss Hill to City, \$1 million
 - Raw water transmission pipes, \$200,000
 - Needed buy 2025
 - Raw water transmission pipes, \$850,000
- State/Federal Regulation Compliance

- Needed by 2009
 - Phase I Wastewater treatment improvements, \$700,000

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