Opportunities for Water Conservation

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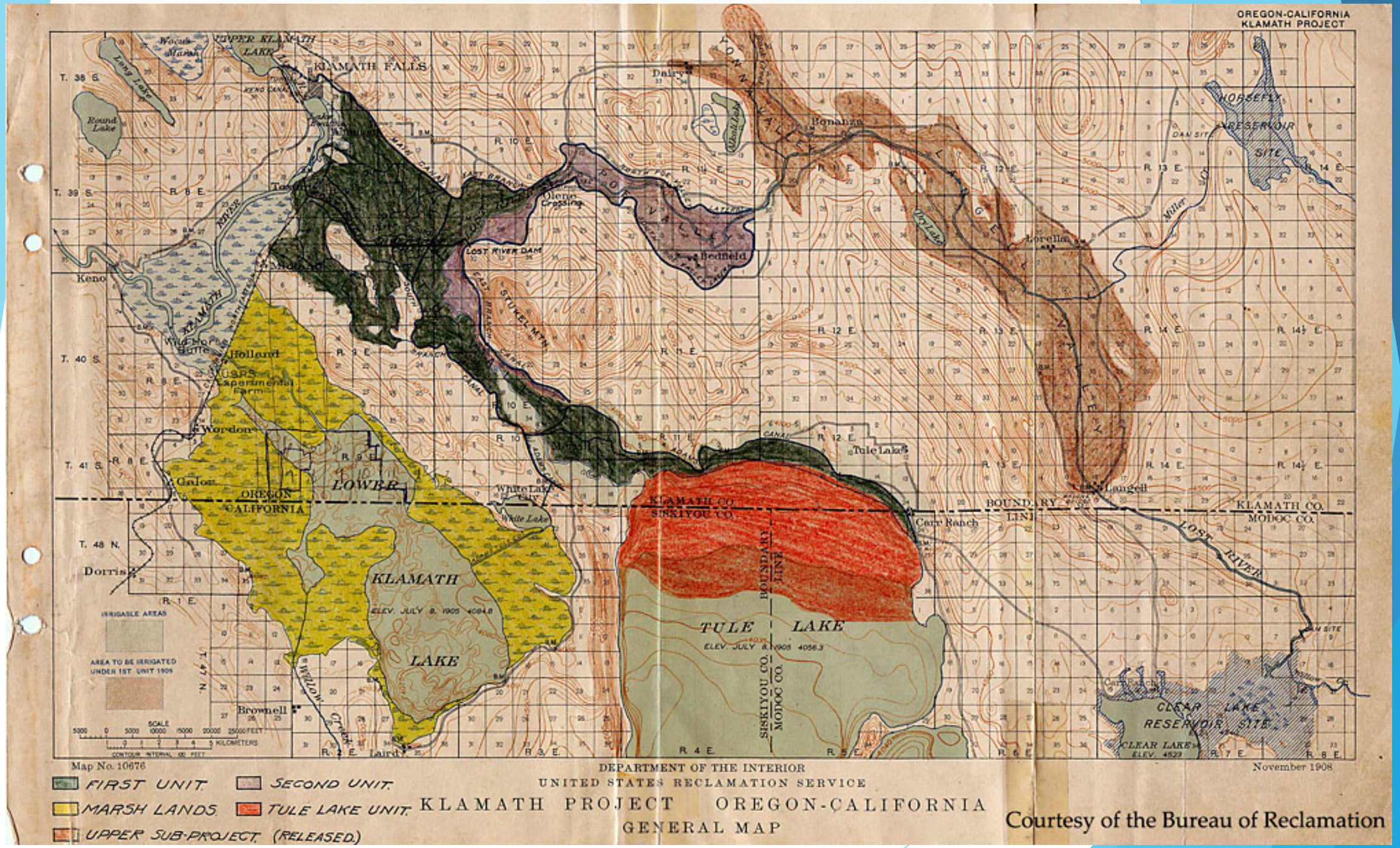
Klamath Project Conservation

- Brief history
- Constraints impacting Project water supply
- Conceptual hurdles for water conservation
- Opportunities for improving conservation
- Next steps

Brief History

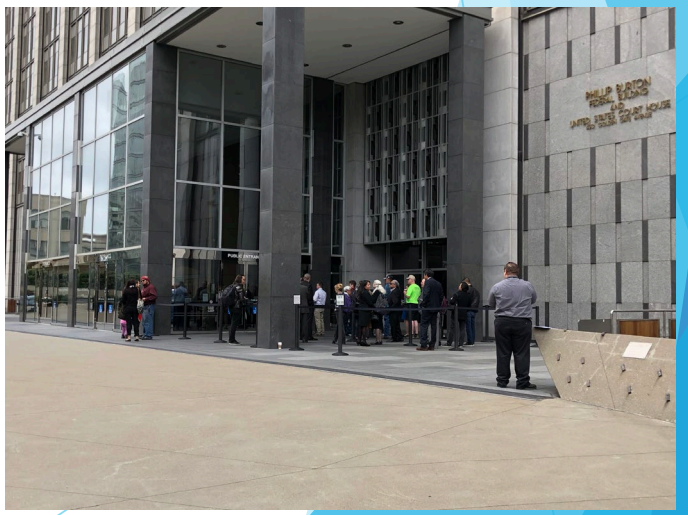
- Lower Klamath Lake
- Tule Lake
- Reclamation Act of 1902
- Klamath Project Authorized in 1905
- Construction began in 1906



Courtesy of the Bureau of Reclamation

Constraints impacting Project water supply

- Three ESA listed species
  - Lost River and shortnose sucker
  - Coho
- Litigation
  - Hoopa Valley and Yurok Tribe v. United States
  - Klamath Tribes v. United States
- Drought
  - 11 Governor Declared Drought's since 2001



KWUA
Klamath Water Users
ASSOCIATION

Conceptual hurdles for water conservation

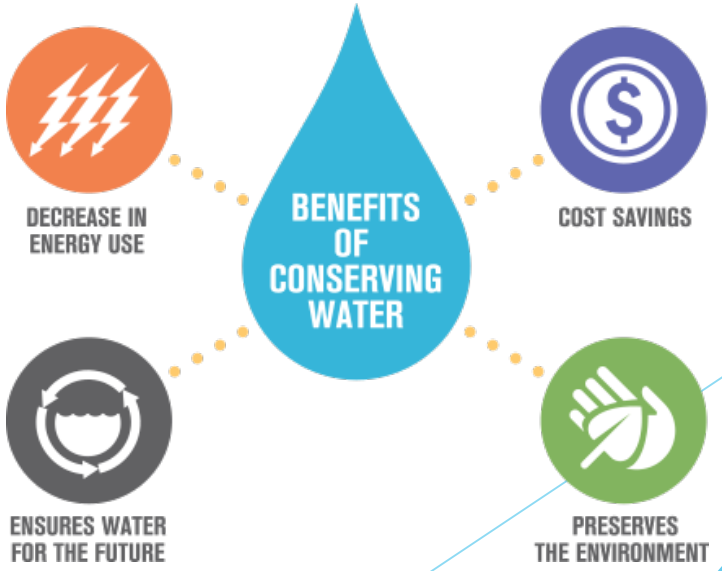
- Klamath Project is already efficient
  - 1993 David's Engineering study (funded by Reclamation) concluded Project is 93% efficient, one of the most efficient in the country
- Open canals recharge the groundwater
  - Lining canals may impact domestic wells
- Excess water benefits fish and wildlife on the National Wildlife Refuges
  - Water generally drains to the south to Tulelake and Lower Klamath NWR

Opportunities for improving conservation

- Reduce power costs
  - Rates up 2000 percent (ag is flooding instead of sprinkling)
  - America's Water and Infrastructure Act of 2018
    - Directs Interior to seek opportunities for lowering power costs
- Programs for irrigation district efficiency
  - Farm Bill may allow NRCS to work with districts on efficiency
    - Additional benefits for district patrons on-farm
- Farmer's Conservation Alliance
  - Working with Klamath Project districts to identify conservation projects that make holistic sense. Report(s) out in 2019
- Eliminate litigation - collaboration
  - Difficult to partner and/or fund conservation projects when in the middle of litigation (this also transcends to water quality, species recovery and other issues plaguing the Klamath Basin)

Next Steps

- Interior Power Cost Study to be completed in 180 days
  - Seek opportunities to implement recommendations to lower power costs
- Continue to work with FCA to identify opportunities to improve efficiency
- Seek partnering agencies and entities interested in water conservation on the Klamath Project
- Identify and publicize benefits of conservation to seek public buy in
  - Environment, species, financial, public perception, future, etc.



Thank You

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Klamath County

One Acre → *Yields* → 2.5 tons (5,000lbs.) Wheat

- 83 bushels per acre
- 60 bushels per ton

→ 70 Loaves Bread per Bushel; 5,810 loaves Bread per Year

= Feeds 44 People per year

132lbs. Wheat per person Per year

One Acre → *Yields* → 45,000 lbs. Potatoes

→ 112 lbs. Potatoes per year per person.

= Feeds 402 people per year

One Acre → *Yields* → 450lbs. Beef

→ 58 lbs. Beef per year per person.

= Feeds 7.75 people per year

ONE Dairy Cow → *Yields* → 6 Gallons Milk per day; 2500 Gallons Milk Per year

→ 20,000 Pints Milk Per year

= Provides 40,000 1/2 pint school lunch servings per year

References

Potato
National Potato Council, 2017 Statistics
http://www.nationalpotatocouncil.org/potato-facts/
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Wheat
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Dairy
https://www.uaex.edu/4h-youth/activities-programs/docs/Dairy%20Facts.pdf
http://www.dairymoos.com/how-much-milk-do-cows-give/
Troy Downing, Extension Dairy Specialist, Oregon State University

Oregon State University

Developed by Paolina Mulleneix SNAP-Ed Extension Program Assistant and Willie Riggs Director, Klamath Basin Research/Extension Center

Oregon TECH

Hands on Education for Real-World Achievement

Oregon Renewable Energy Center

Assoc. Prof. Mason Terry, PhD

OREC

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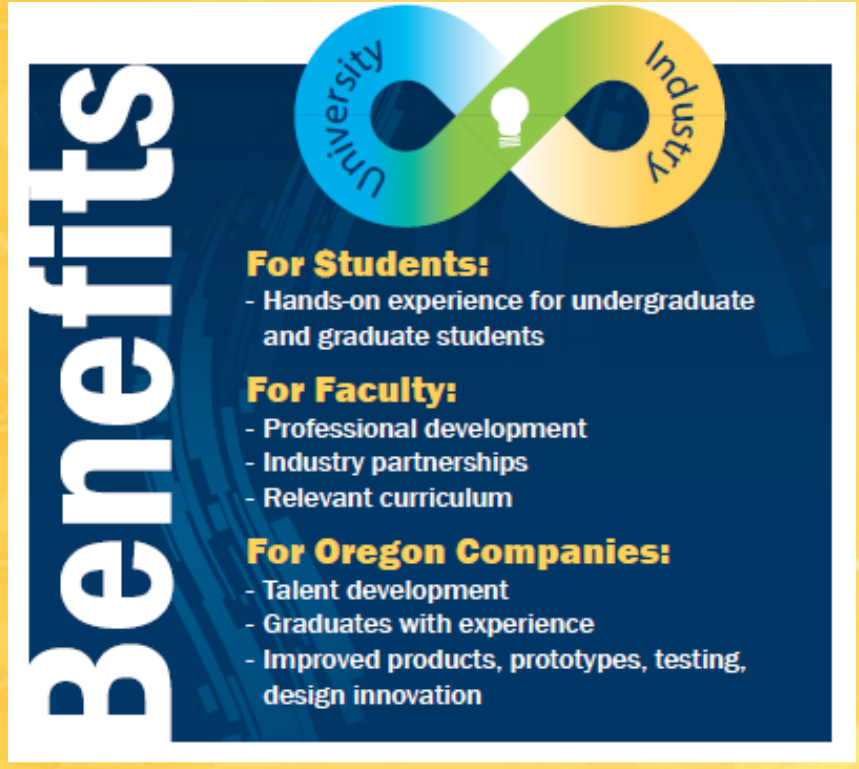

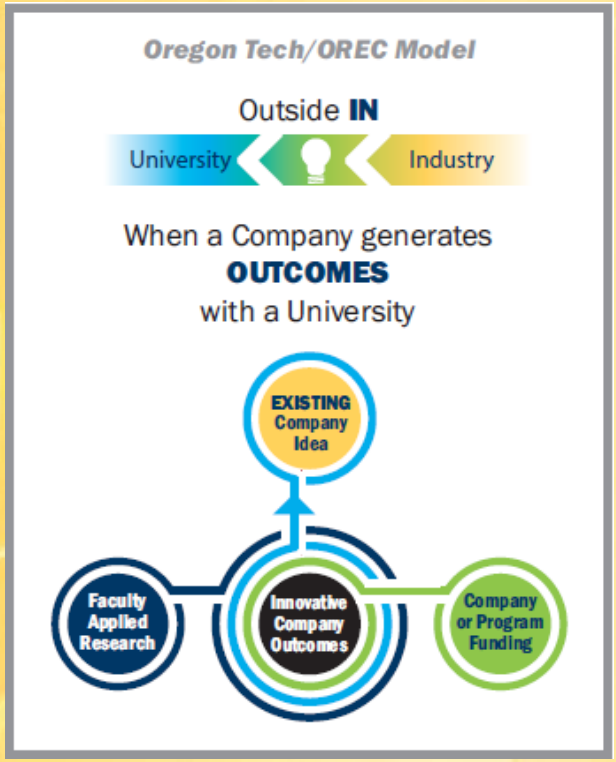

Hands-on education for real-world achievement.

Renewable Energy in Ag

- One of if not the largest yearly agricultural cost: electricity mainly for irrigation pumping!
- Renewable energy sources:
  - Photovoltaic
  - Hydro
  - Biomass

Hydroelectric

Three-Sisters Irrigation District:

- District:
  - 7,600 acres of irrigated farm ground, 1000 acres flood.
  - Before: 64 miles of canals/private laterals and losing over 50% of the water diverted from Whychus Creek lost to seepage and evaporation.
  - Now: 50 miles piped; on-farm deliveries increased 25% with 20.26cfs minimum flow maintained in Whychus creek.
  - Pressurized delivery to all farms.
  - All farms will be moved to pivot irrigation.
- McKenzie Pipeline Project
  - 2,000 acres served with pressurized delivery; removed 38 pumps conserving 3,000,000kWh/yr.
  - 3.77 miles of double 54” HDPE pipe into 700kW hydroelectric power generation (170ft elevation change).
  - Saves 3,100,000kWh/yr.; enough to power 300 homes Mar. to Nov.

https://www.tsidweb.org

Solar Powered Irrigation

- 10kW pumping: ~300gpm @ 60psi
- Cost for new grid connected irrigation pumping connection:
  - $25,000 (if 3-phase power exists at location) plus yearly operation costs.
  - Remote pumping location + $10,000-15,000 (wire, trenching)
- Cost for off-grid pumping solution (DC side, photovoltaic array + battery storage)
  - ~$50,000
  - $0 yearly electricity costs
  - 20yr. savings of ~$100,000-$200,000 (usage dependant)
- Combined with irrigation system modernization – ~30-50% water savings with no yearly pumping costs.

Solar Power Pivot

- Off-grid solar powered pivot system.

48 Volts DC, 100 Watt, Geared DC Motor, coupled to a Heavy Duty Gear Box

http://www.solarirrigation.systems/?lightbox=i11buw

http://www.magetsi.com/solar_powered.html

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Q & A

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