

Forestry and Water Quality Issues for Oregon

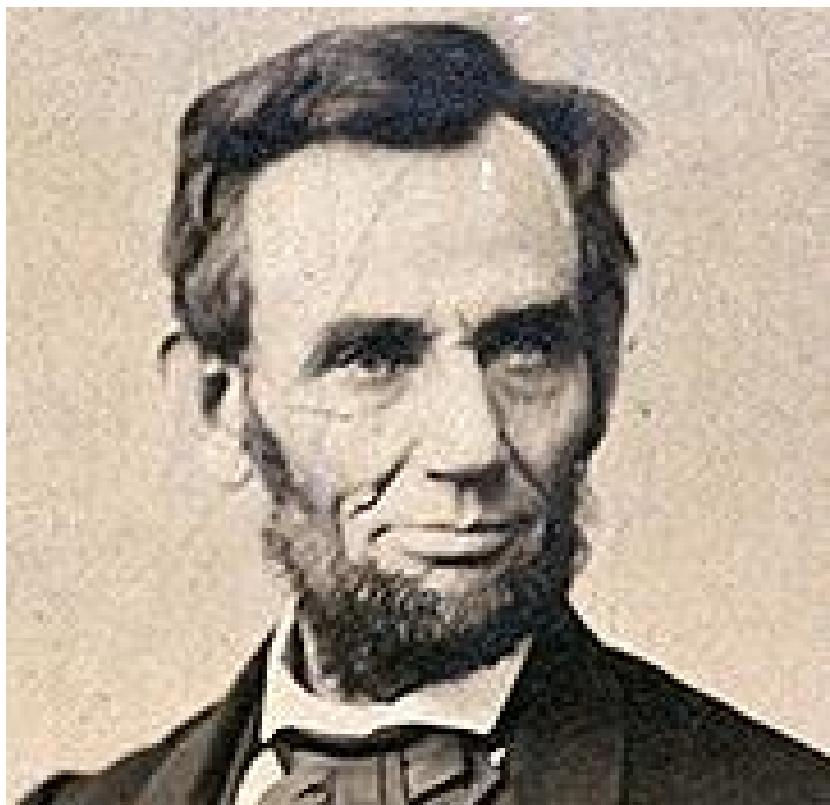
Dr. George Ice, C.F. 54, R.P.F. (CA) 1898, P.H. 1092
National Council for Air and Stream Improvement, Inc.

Oregon Society of American Foresters Annual Meeting
Seaside, Oregon
April 25-27, 2012

Seaside FPA Address

(with apologies to Abraham Lincoln)

Gettysburg Address



Seaside FPA Address

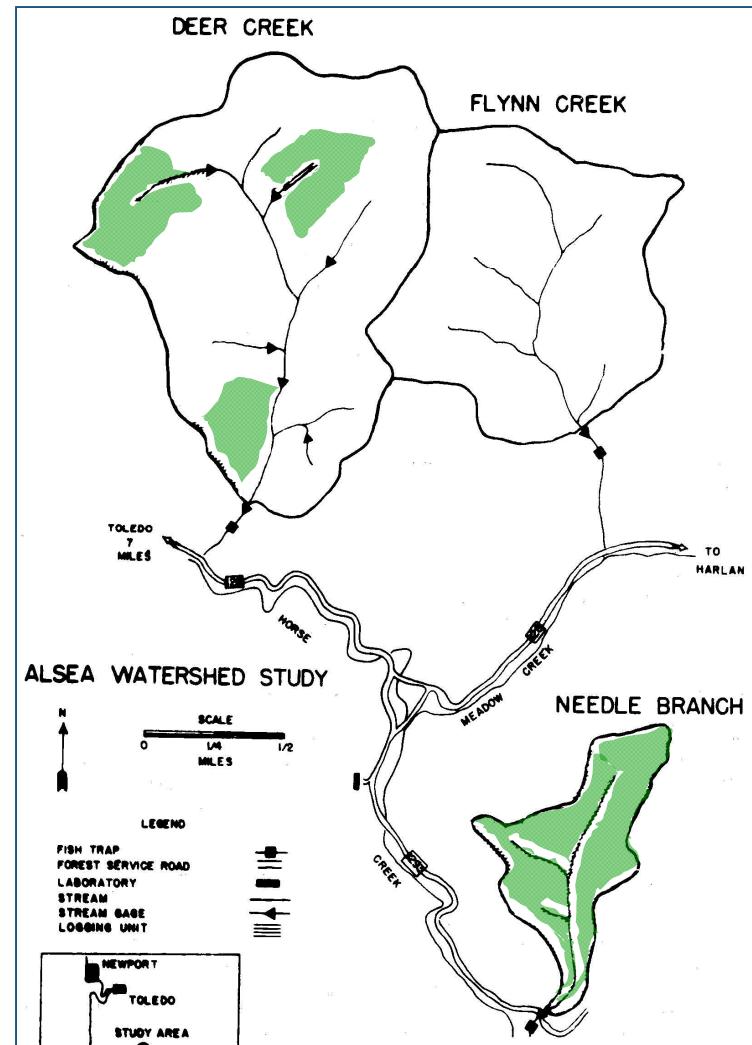


Key Challenges for Forestry and Water Quality

- ” Ongoing review of the adequacy of the Oregon Forest Practices Act rules
- ” Interpretation of existing water quality standards and development of new water quality standards
- ” Management of forest road runoff and regulatory, judicial, and legislative uncertainty
- ” Advocacy group criticism of the use of forest chemicals, especially herbicides

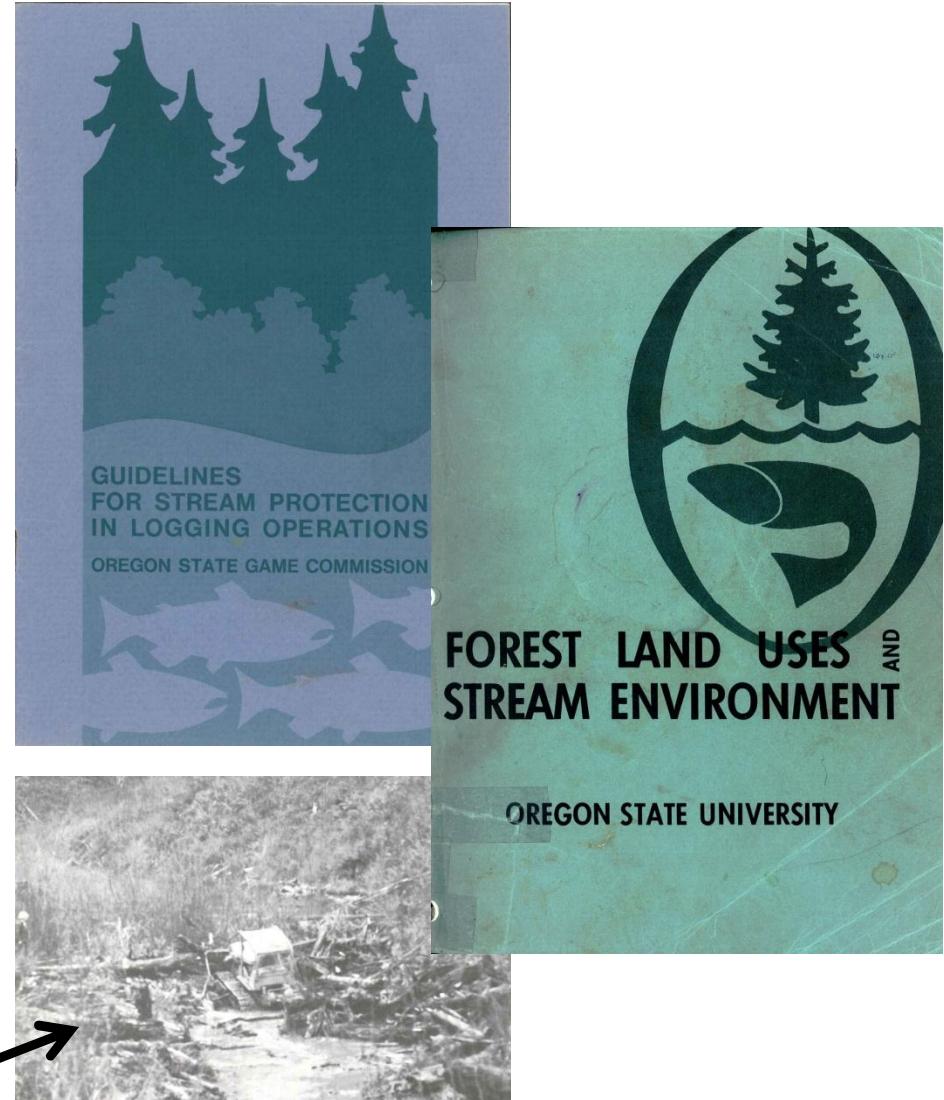
The Original Alsea Paired Watershed Study

- ” Began in 1957
- ” Quantified effects of forest management on water quality and fish
- ” Paired watersheds, one basin completely clearcut and another 25% patch cut with buffers



Influence of Alsea Watershed Study

- “ Developed simple guidelines to protect water quality and fish habitat
- “ Oregon adopted first forest practices act in 1971 designed to protect water quality and fish
- “ Rules largely based on Alsea Watershed Study



Comparison with Four Decades of Change

Pre-1980s Rules

- ” Neither an optimum nor a minimum width can be set arbitrarily for buffer strips for shading streams
- ” Where it is difficult to leave buffer strips of timber to shade a stream, plan to re-establish cover without delay...

Contemporary OR FPA Rules

Table 2-3 Riparian Management Area Widths (for each side of a stream)			
Stream Size	Type F	Type D	Type N
Large	100 feet	70 feet	70 feet
Medium	70 feet	50 feet	50 feet
Small	50 feet	20 feet	Specific protection measures (see Table 2-14)

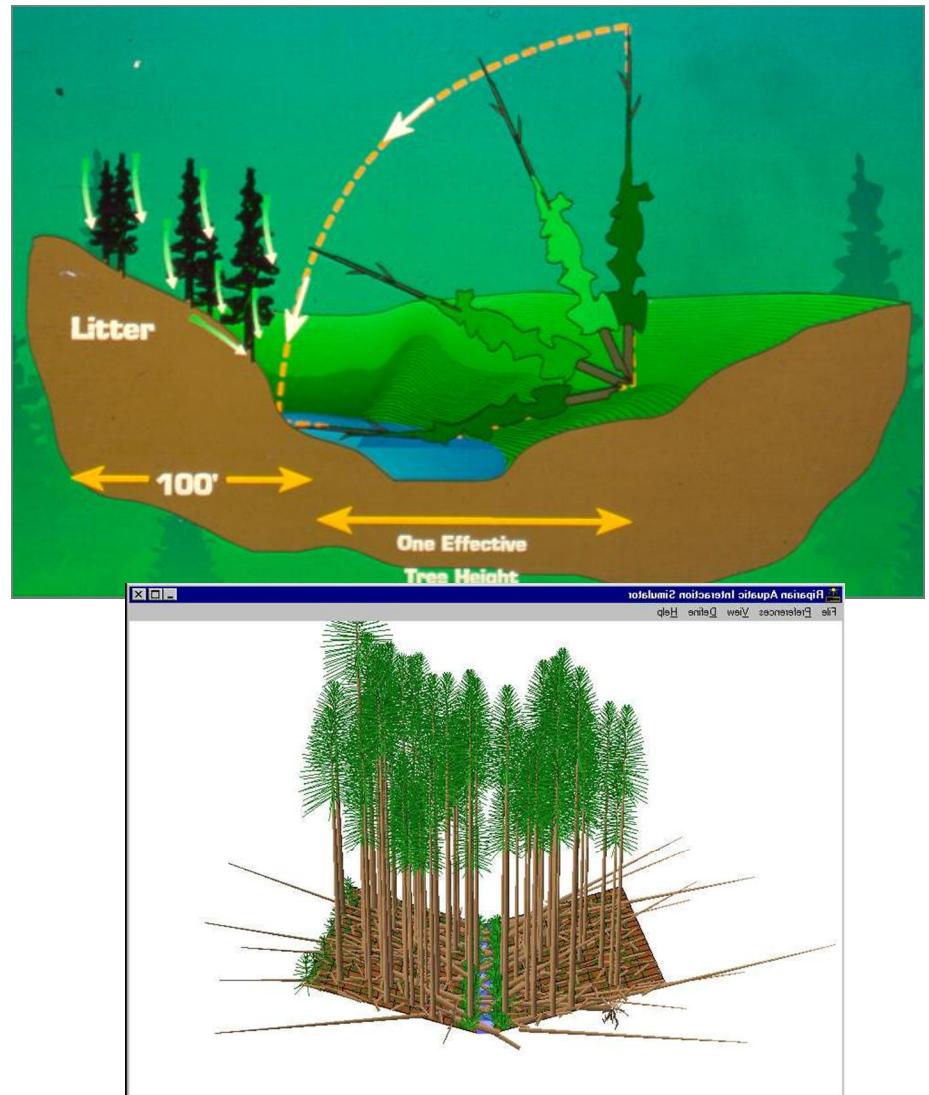
Geographic Region	Table 2-4 Streamside Tree Retention for Type F Streams with Type 2 or 3 Harvest					
	Square Feet of Basal Area per 1,000 feet of Stream, Each Side					
	Large Type F RMA = 100 feet		Medium Type F RMA = 70 feet		Small Type F RMA = 50 feet	
Coast Range & S. Coast	230	170	120	90	40	20
Interior & W. Cascade	270	200	140	110	40	20
Siskiyou	220	170	110	90	40	20
E. Cascade & Blue Mountains	170	130	90	70	50*	50**

* The maximum live conifer basal area that must be left is 40 square feet. The other 10 square feet may come from snags, dying trees or hardwood trees if available in the RMA.

** The live conifer basal area may be reduced to 30 square feet for the active management target. The other 20 square feet must come from snags, dying trees or hardwood trees if available in the RMA.

Now Don't Just Keep Pollutants Out!

- “ Large Wood recruitment to provide for cover and rearing areas
- “ Allochthonous inputs of fine organic debris
- “ Sediment to maintain gravels
- “ Off-channel habitat formation



Disturbance Ecology



North Fork Boise Wildfires, Boise National Forest

Judicial Decisions Challenging FPA

Northwest Environmental Advocates v. Locke et al.

- “ Settlement Agreement for Oregon’s Coastal Zone Management Act (CZMA)
- “ CZMA is voluntary and provides funds
- “ EPA and NOAA criticism of forest protection for headwater streams, abandoned roads, landslide prone areas
- “ Implementation-ready TMDLs

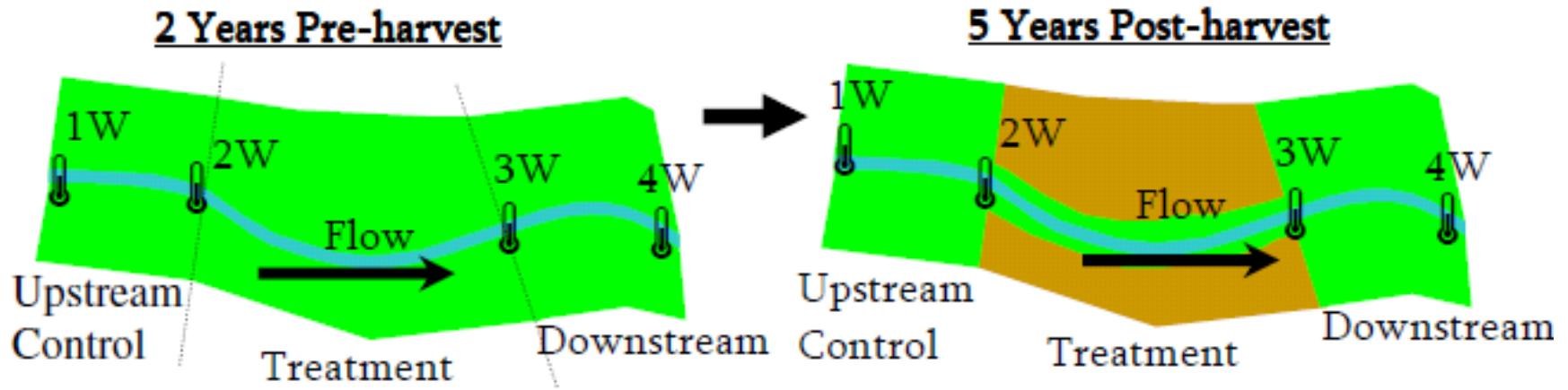
Northwest Environmental Advocates v. EPA

- “ Court defers to Oregon DEQ in setting numeric water quality standards
- “ Although EPA is not authorized to regulate nonpoint pollution sources, it is required to review narrative BMPs...“intrinsically intertwined” with ODEQ’s water quality standards

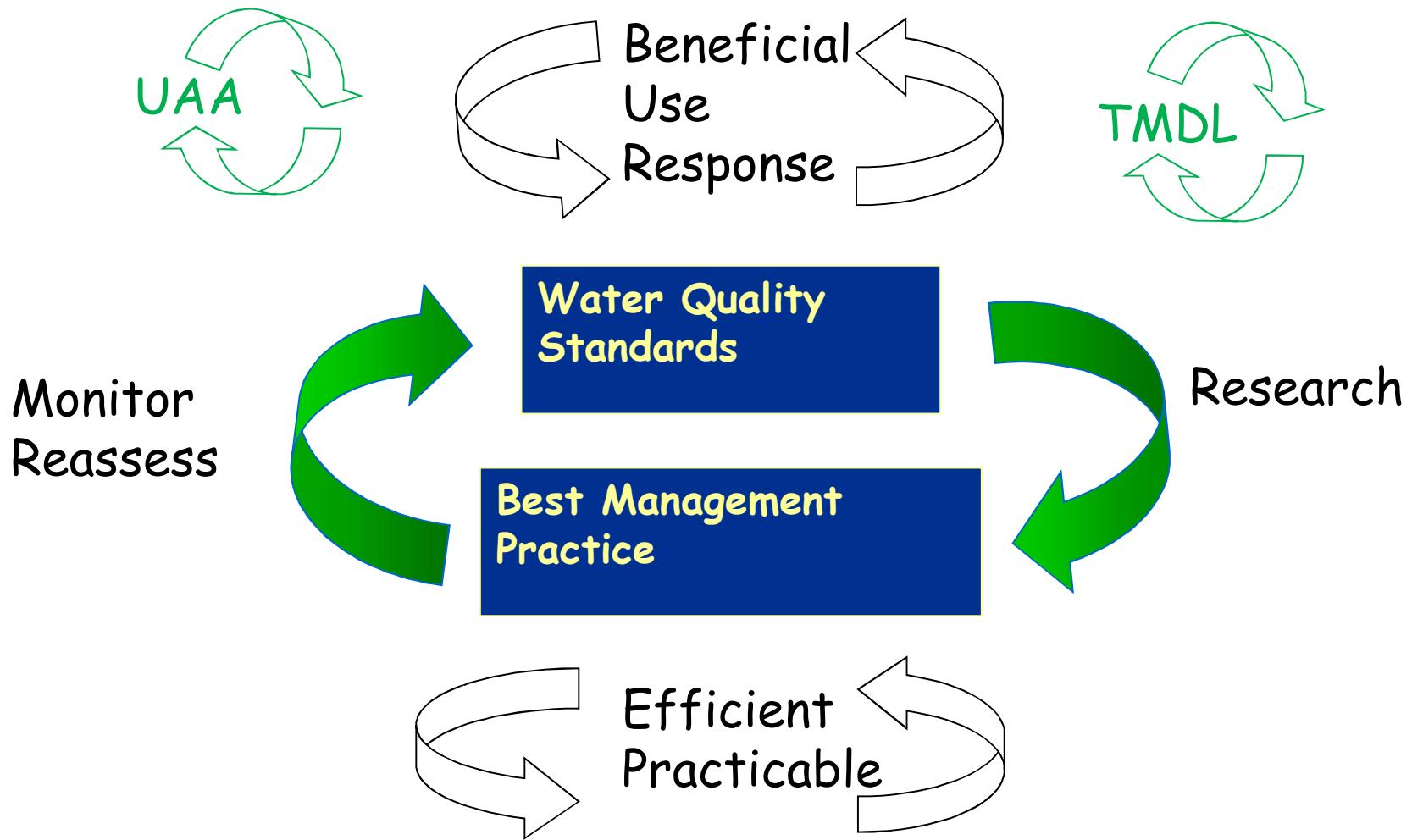
EPA and NOAA not supporting research

RipStream

(2012 OR SAF Forest Science Award)



- ” 33 sites on state and private lands
- ” Before-After-Control-Impact (BACI) design
- ” Harvested to minimum standards
- ” Increased frequency (40% compared to 5% background) of PCW standard (0.3°C) being exceeded

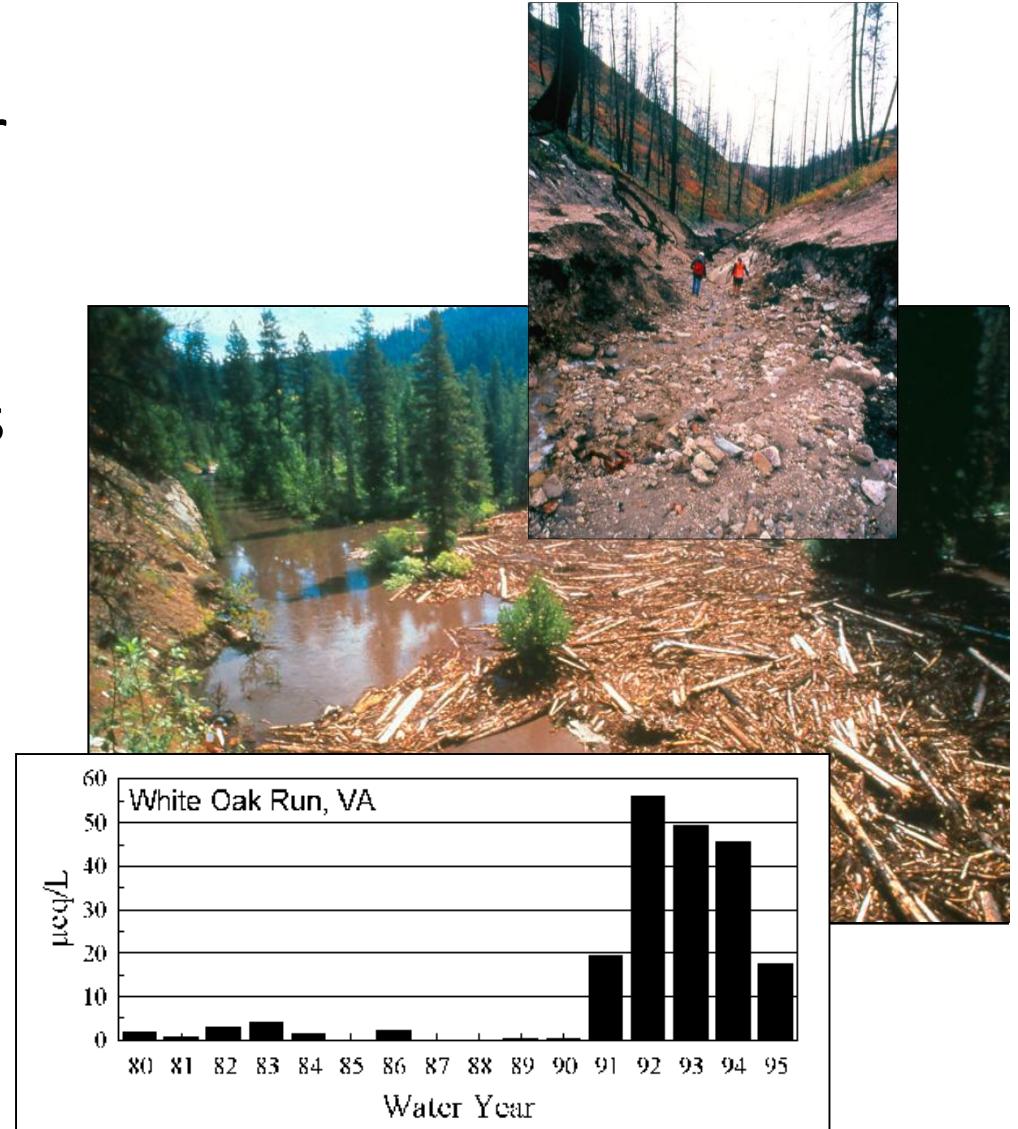


UAA = Use Attainability Analysis

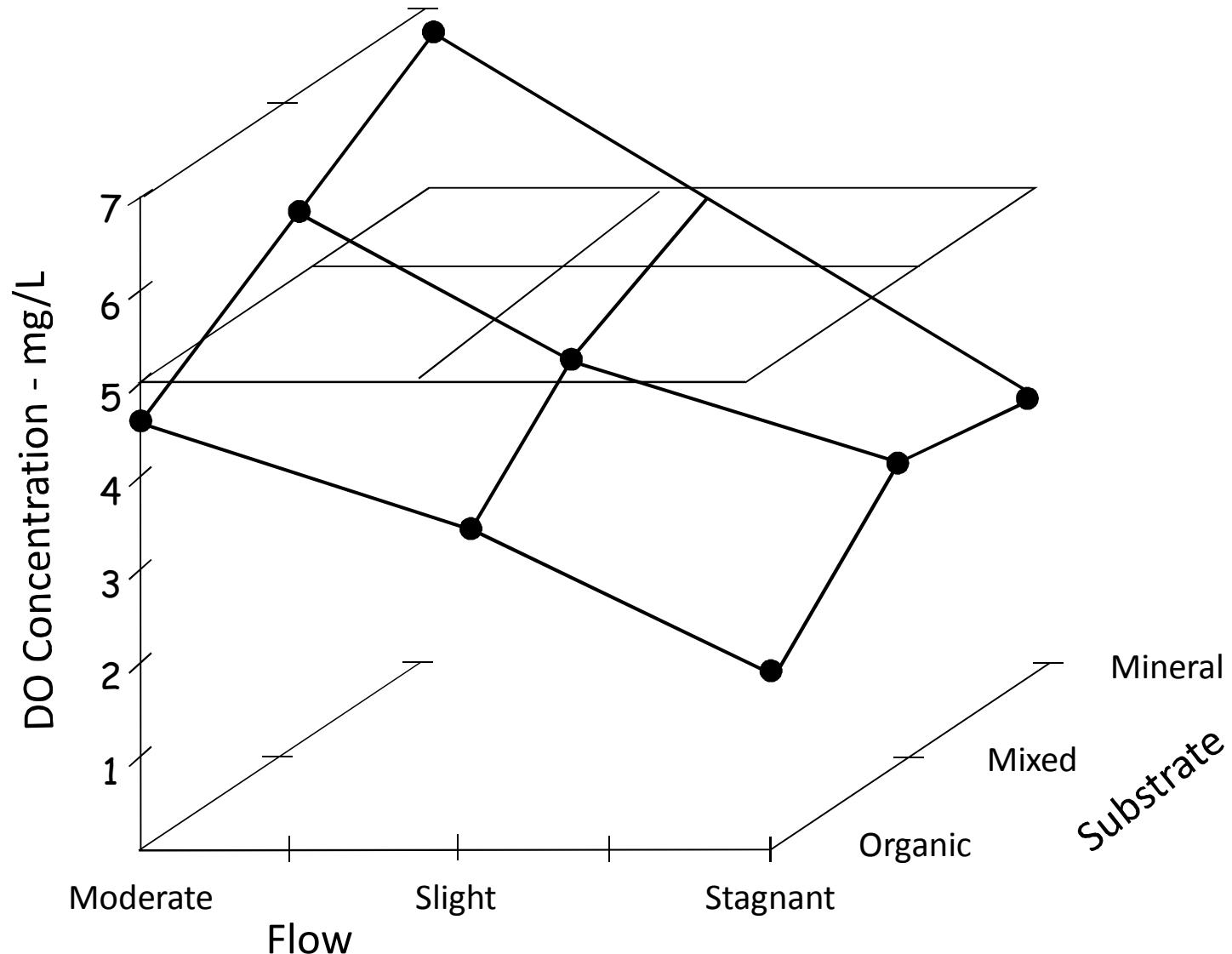
TMDL = Total Maximum Daily Load

Regulation Using Water Quality Standards

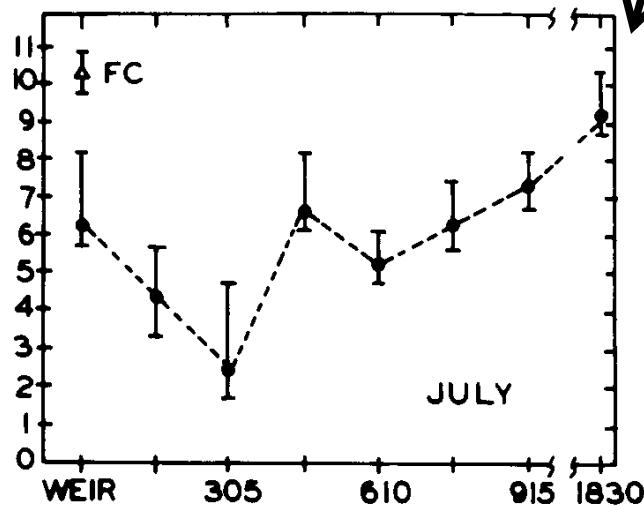
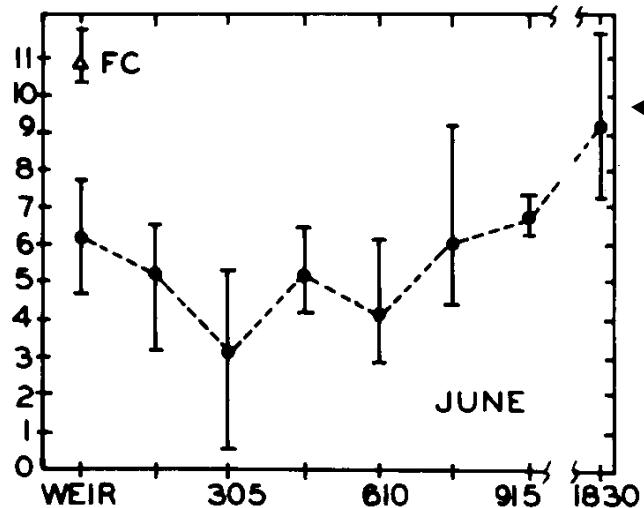
- “ Water quality standards have been established for point source discharges and largely ignore the variability inherent in headwater forest systems
- “ Not attainable
 - . Nutrients
 - . Temperature
 - . Dissolved oxygen
 - . Sediment
- “ Antidegradation needs to consider management cycle



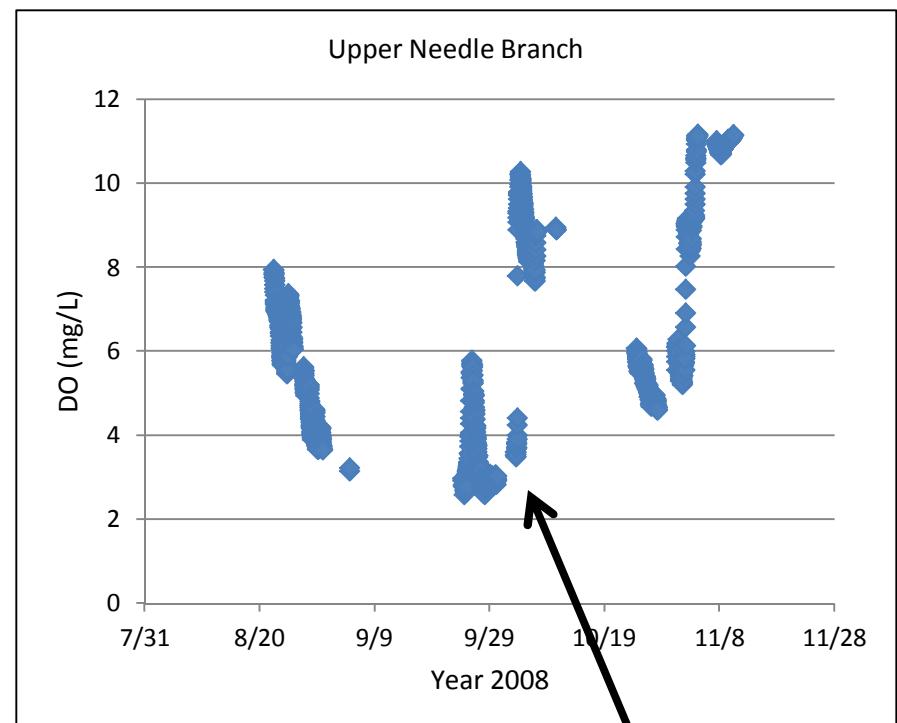
Explaining Expected DO Patterns in Louisiana - A Synoptic Survey



New Understanding of DO in AWS



BOD from slash and stream heating
depress dissolved oxygen concentrations



Groundwater and hyporheic flow in late
Summer and Fall depress DO conc. naturally

Biologically Relevant Change?

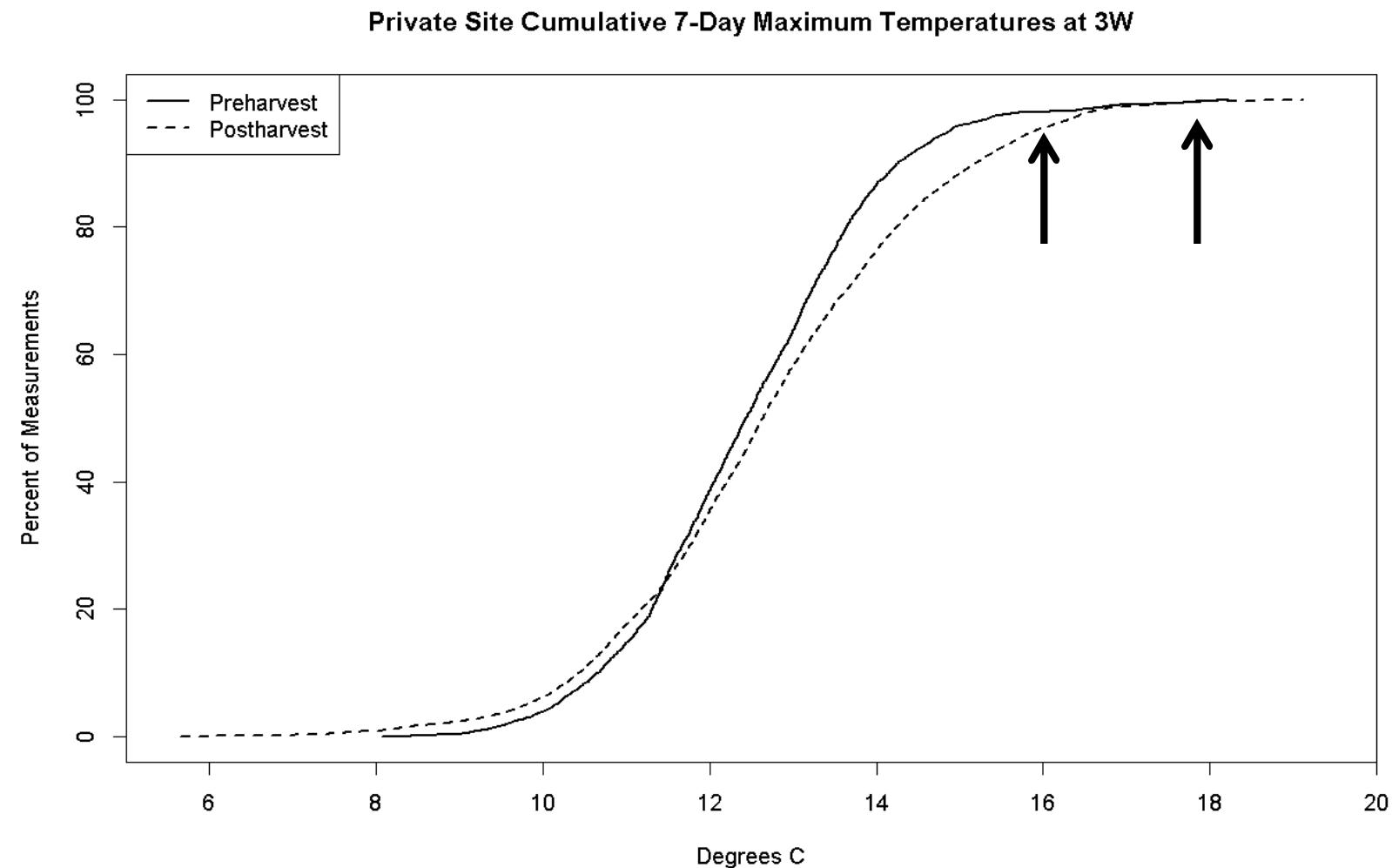
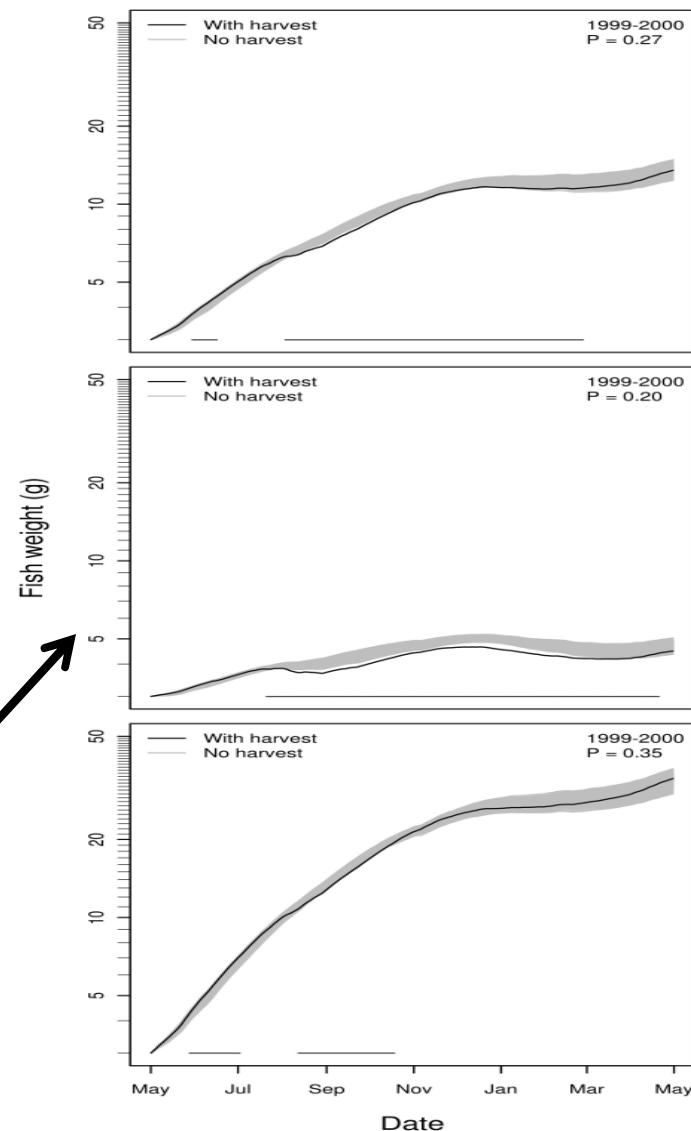


Figure supplied by J. Groom, ODF

Biologically Relevant?

- “ Murphy et al. (1981) – Higher primary productivity in exposed streams
- “ Wilzbach et al. (2005) – Increased salmonid productivity with removal of riparian cover
- “ Mellina and Hinch (2009) – Meta-analysis found increased fish productivity with riparian clearcuts if large wood retained
- “ Leach et al. (2011) – Changes in timing of fish growth based on bioenergetic model, but change was small and potentially overwhelmed by additional food



Maximum Stream Temperature Differences

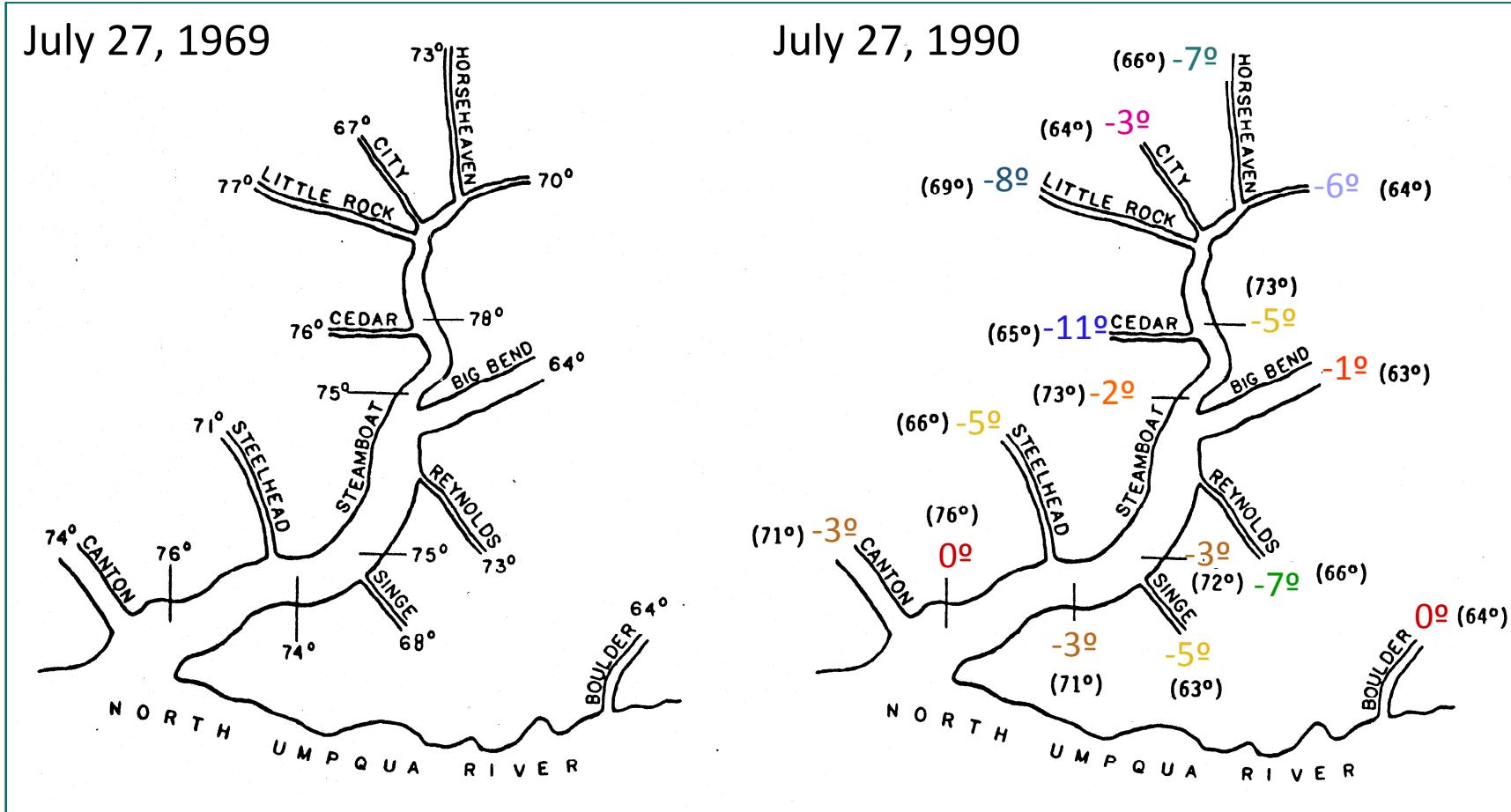
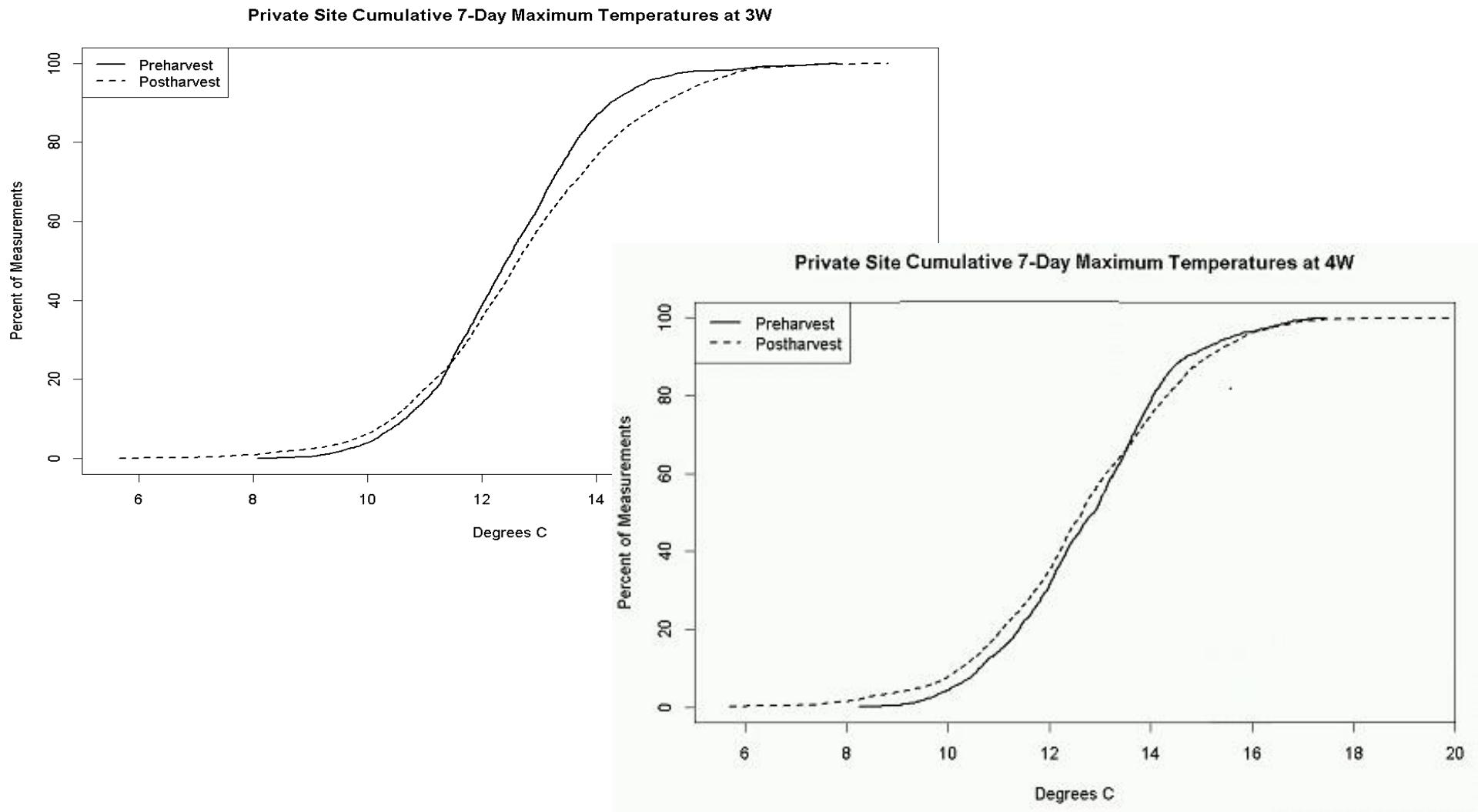
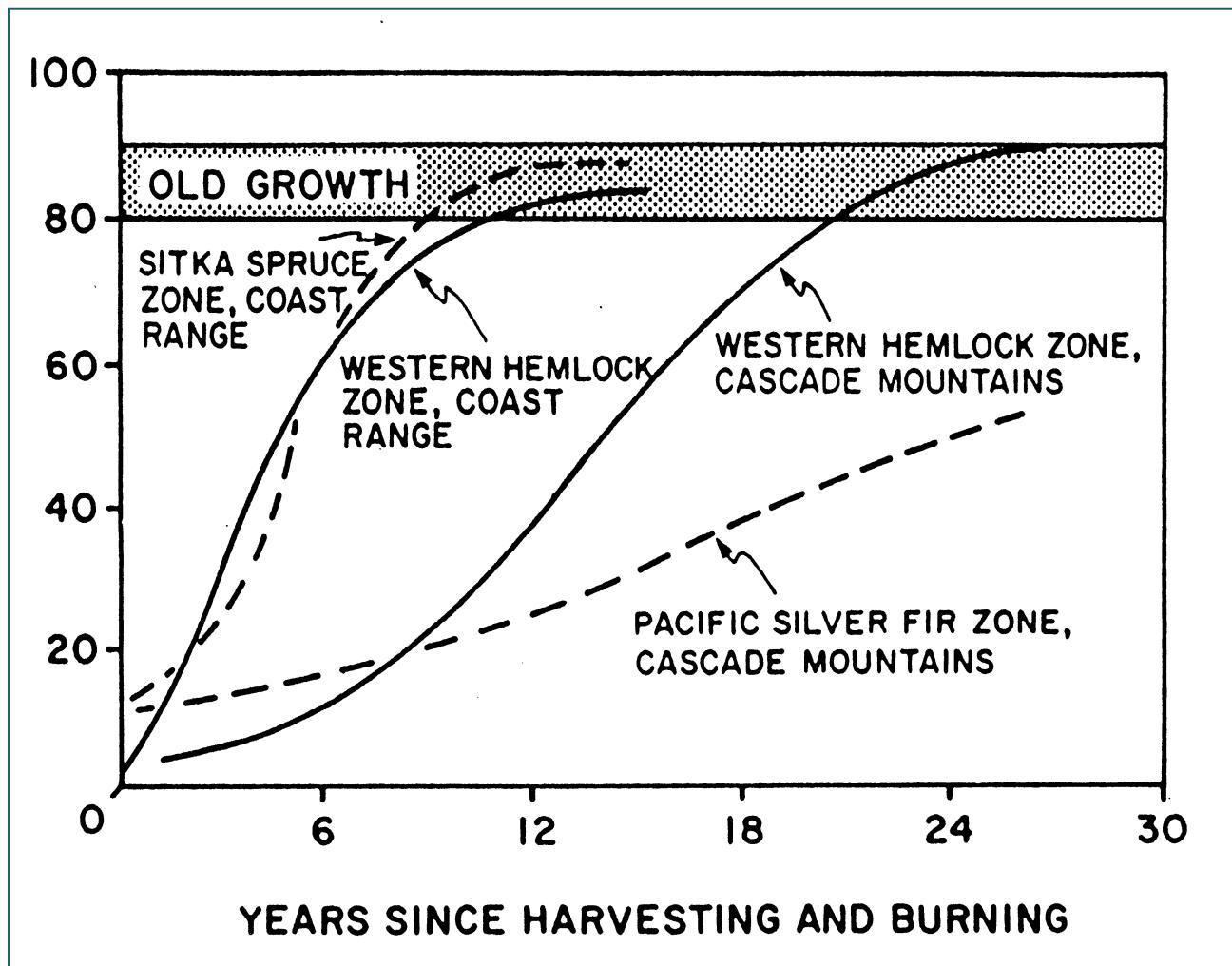


Figure from Holaday 1992

RipStream Shows Evidence of Downstream Recovery



Relation Between Angular Canopy Density (ACD) and Stand Age



Comparing to Natural Disturbances

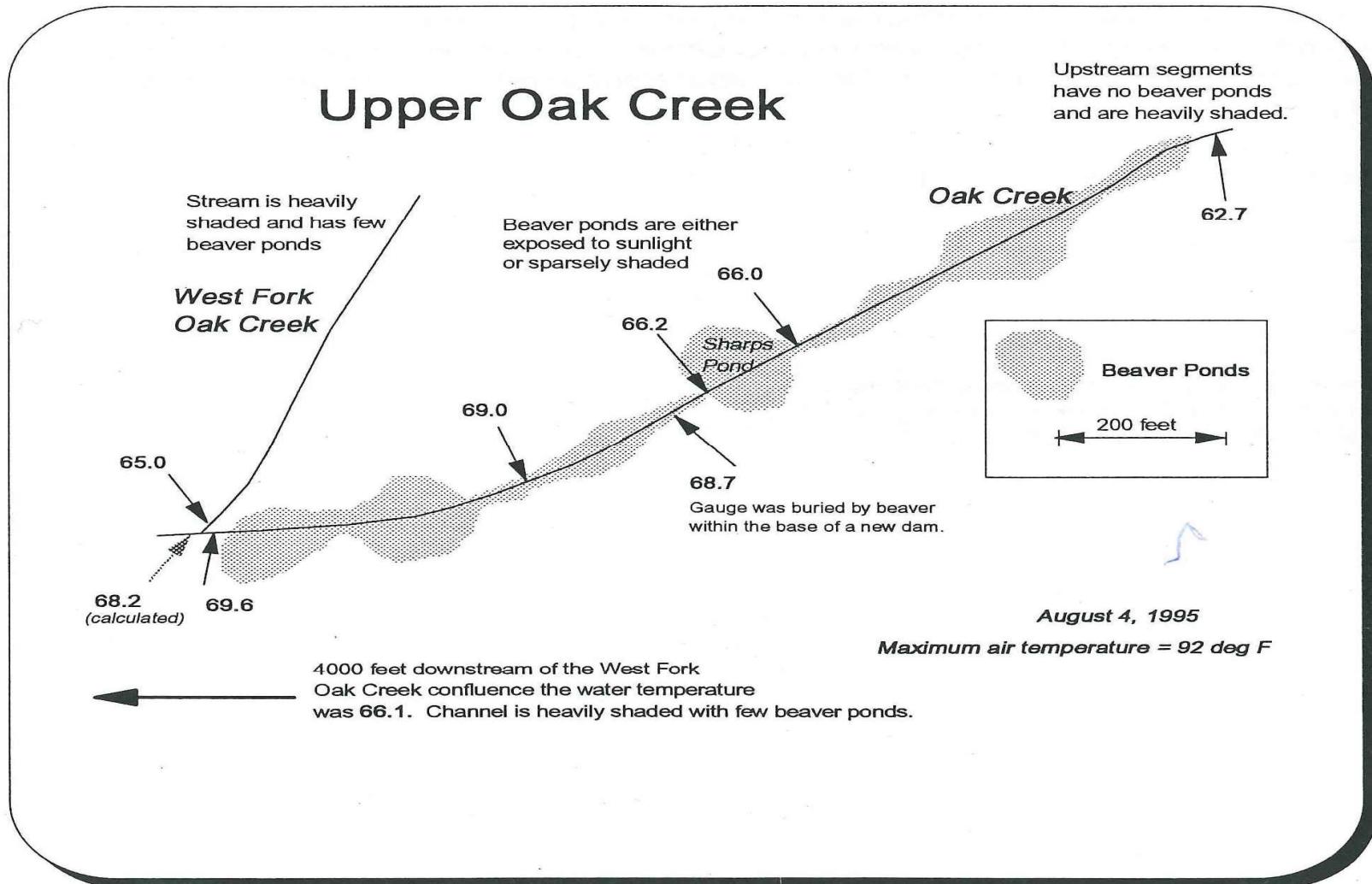


Figure from 1995 report by Chip Andrus

Forest Roads

- ” Judicial uncertainty
 - . 9th Circuit Court overturned favorable decision – point source
 - . US Supreme Court considering review
- ” Legislative uncertainty
 - . Time out legislation
 - . Silvicultural exemption
- ” Regulatory uncertainty
 - . ODEQ drafting general permit



What is it Like to Operate under a Stormwater Permit Program?

- “ Humboldt Redwood Company tour – March 10 , 2011
- “ Watershed analysis/inventory to identify problems
- “ Compliance audit
- “ Wet weather inspection
- “ Erosion void project
- “ Annual inspection (all roads, every year)
- “ Notification of failure to comply
- “ Sediment/WQ sampling



Costs of Road Program

- ” Hard to separate HCP elements from permit requirements
- ” Road costs
 - . \$10,000,000 annually for road restoration
 - . \$500,000 a year for third party inspections
 - . \$7 per mile for sediment source inventory
 - . \$2.10 per acre for annual road inspection
 - . WQ monitoring/reporting costs



Point vs. Nonpoint Sources

- “ End-of-pipe, easy to identify
- “ Product of manufacturing
- “ Loads far in excess of natural loads
- “ Stationary, easier to monitor
- “ Production strongly influences loads
- “ Ill-defined, diffuse sources (*goal of road drainage to pass across and disperse runoff*)
- “ Usually natural materials (*major concerns are sediment and runoff*)
- “ Loads relatively low from any one source (*BMPs, road surveys, and mitigation reduce impacts*)
- “ May move across landscape, impact diminished over time (*road impacts diminish over time, activity related*)
- “ Hydrology strongly influences (*precipitation affects road runoff, especially intensity*)

EPA Fact Sheet on Stormwater Phase II

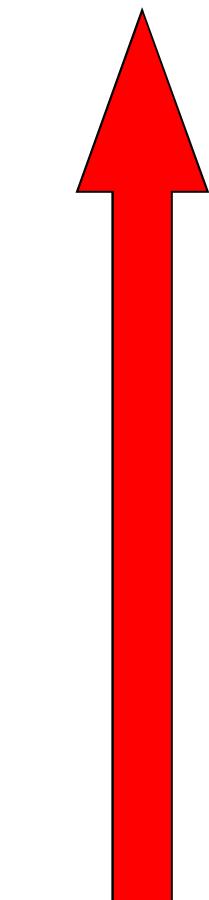


- ” Sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands and 1000 to 2000 times greater than those of forest lands

(image from <http://www.wolfrunwater.org/Dirt-Out/default.htm>)

25,000 kg/ha
cropland rate
 \times SDR

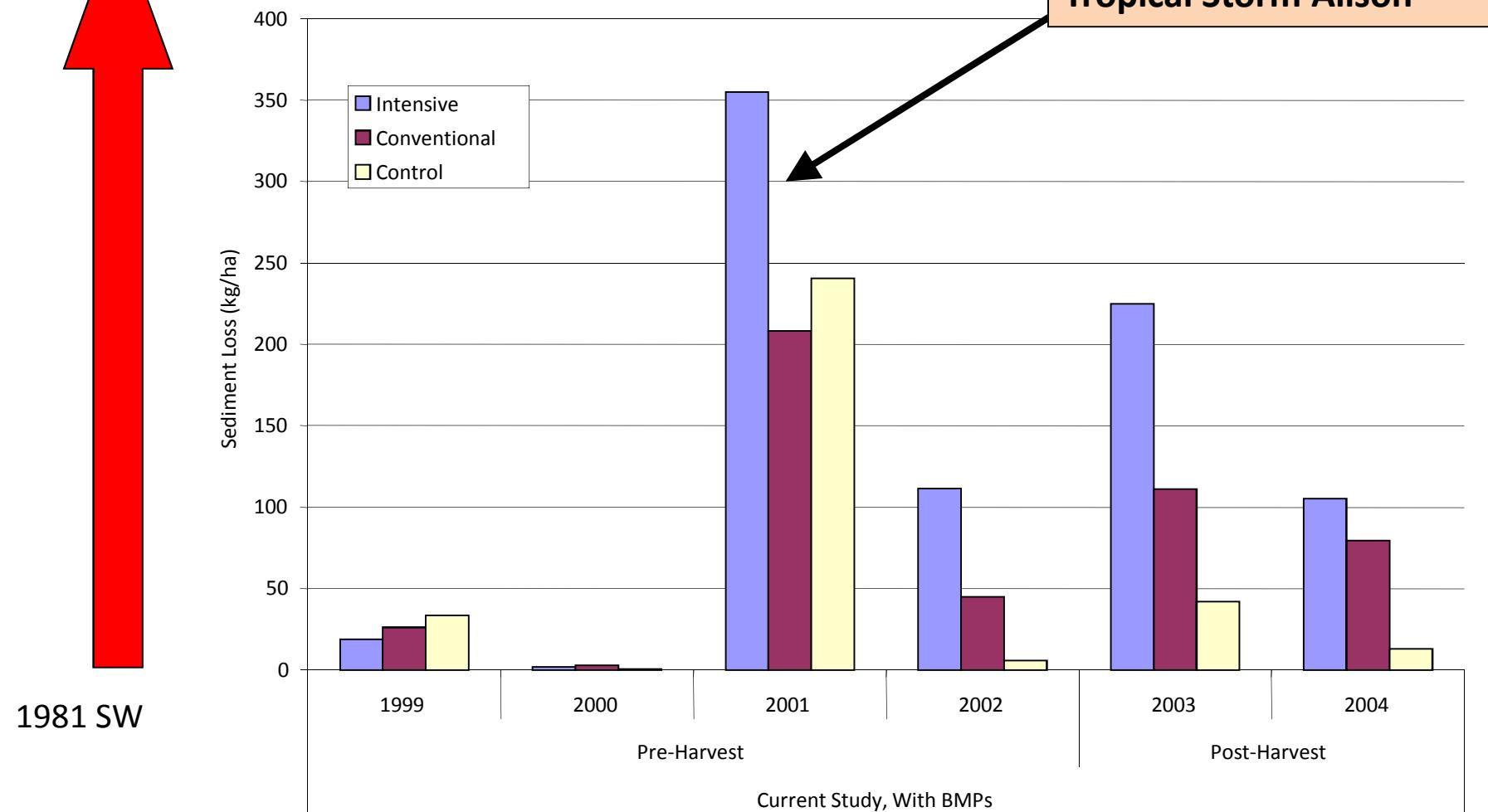
3000 kg/ha



Sediment Loss 1999-2004

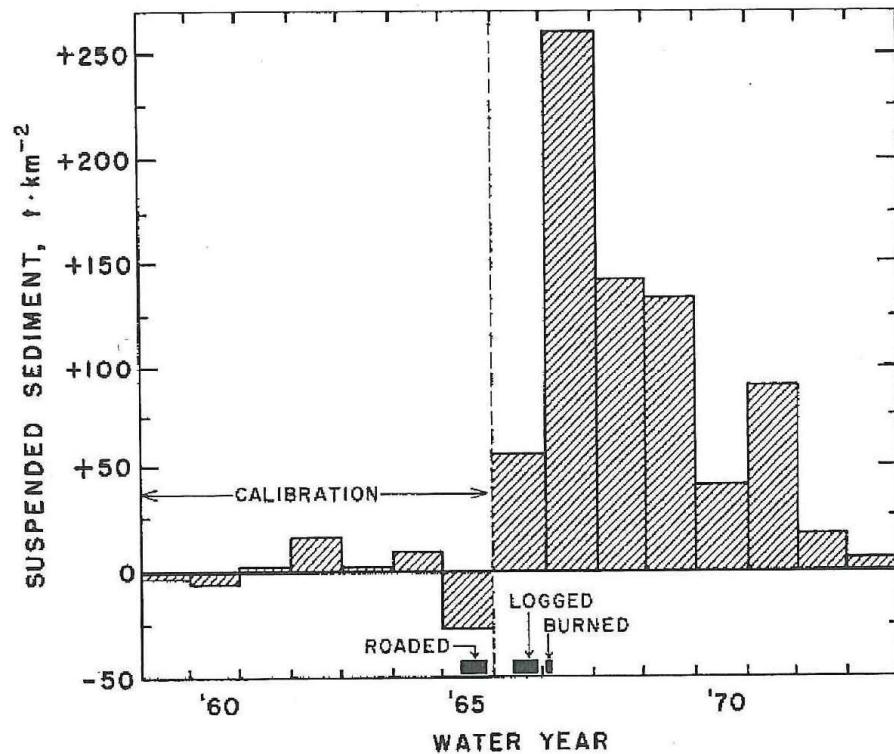
(McBroom et al. 2008)

Tropical Storm Alison

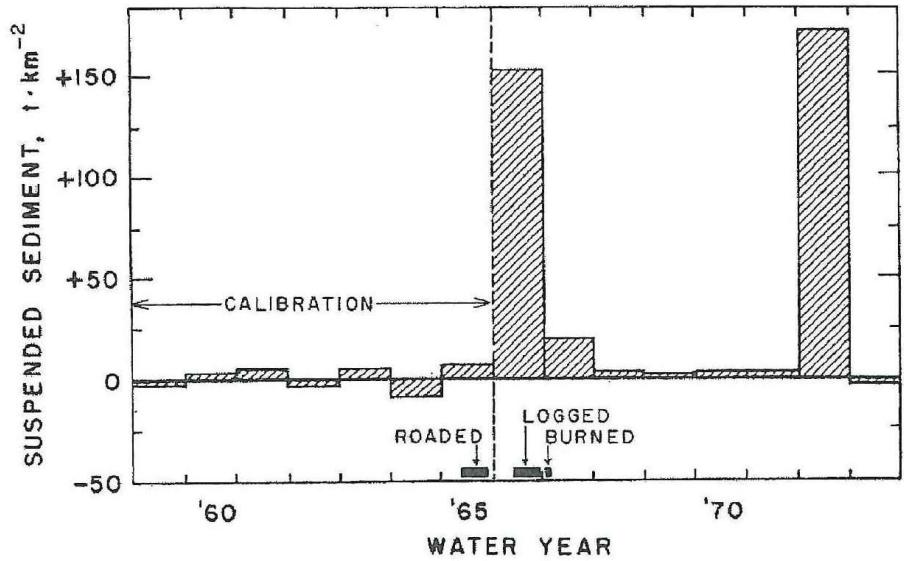


Sediment Response – Alsea WS

Needle Branch – Complete CC



Deer Creek – Patch Cut





Sidecast road failures



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Redding Record Searchlight -- SPI criticized for herbicide use

by Dylan Darling
January 10th, 2009

Critics of the state's largest private landowner say it's spraying too much herbicide on its cleared timberland.

"It's a tool like a chain saw for them and we think it should be something used as a last resort," said Joshua Buswell, Sierra campaigner for ForestEthics, a nonprofit environmental group with offices in San Francisco, Washington, D.C., and Canada.

The group recently released an analysis of state data that showed Anderson-based Sierra Pacific Industries sprayed more than 335,000 pounds of herbicide - chemicals that kill plants - on its land in the north state between 1995 and 2006.

But Sierra Pacific Industries, and other companies in the forestry industry, use less than 1 percent of the herbicide sprayed in the state, said Mark Pawlicki, spokesman for the Anderson-based company.

He said the agriculture industry sprayed more than 350 million pounds of herbicide during the same period in farm-heavy Fresno County.

"And, of course, in Fresno County that was put on the food we eat," Pawlicki said.

Ingredients in the herbicides used on Sierra Pacific's land include atrazine, which has been shown to cause male frogs to gain female sex organs and has been outlawed in Europe, said Tyrone Hayes, a biology professor at the University of California at Berkeley.



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Media Coverage

[Redding Record Searchlight -- SPI criticized for herbicide use](#)

[Globe and Mail -- Syncrude facing private prosecution over dead ducks](#)

[Audubon Magazine -- Paper Chase](#)

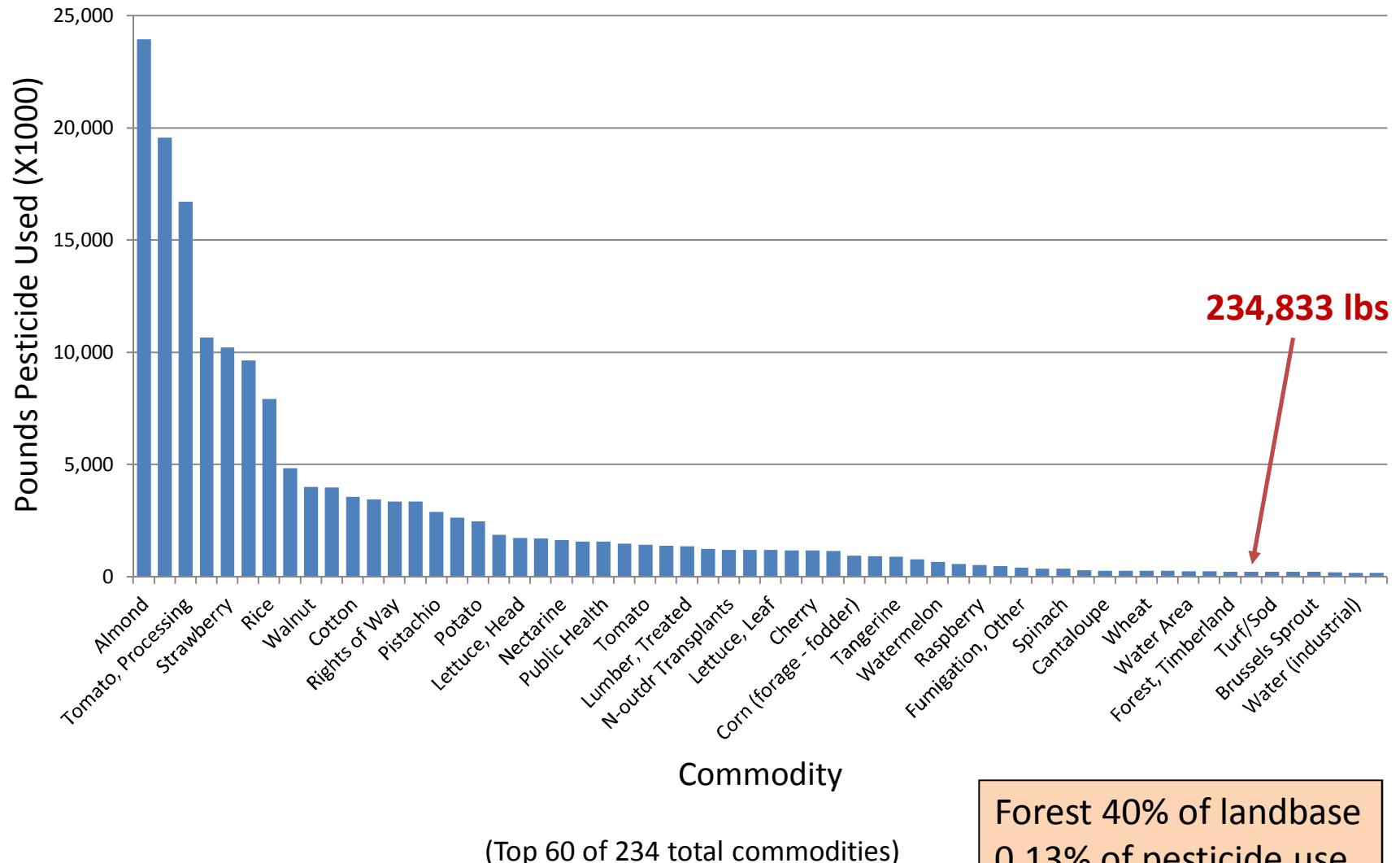
[More »](#)

Press Releases

[Full-Page Tar Sands Ad in USA Today: "President Obama, you'll never guess who's standing between us and our new energy economy."](#)

[Canada Places 'Personal Ad' to Obama in US Newspapers ahead of his Feb. 19 Visit](#)

Pesticide Usage in California 2007



Pitchfork Rebellion (Triangle Lake, OR)

- ” Members of the Pitchfork Rebellion have claimed harm by industry sprays
- ” No evidence from PARC, urine data reported by Pitchfork Rebellion at Board of Forestry Meeting not reproducible by CDC



Image from <http://www.examiner.com/outdoor-living-in-eugene/eugene-area-facing-environmental-nightmare-outside-of-town-at-triangle-lake>

Conclusions

- ” The Oregon Forest Practices Act and its rules are under increasing scrutiny by state and federal agencies and the courts
- ” Ongoing research on contemporary forest practices is often unappreciated and unsupported
- ” Water quality standards used to assess BMP effectiveness can be unattainable and biologically irrelevant
- ” Forest roads and application of pesticides present especially controversial new challenges