



# Climate Change: Risk and Opportunities

*Presented by*

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Region 10

Yakima, Washington

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# *From the 2008 State of the Union Address*

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*“To build a future of energy security, we must trust in the creative genius of American researchers and entrepreneurs and empower them to pioneer a new generation of clean energy technology. Our security, our prosperity, and our environment all require reducing our dependence on oil.”*

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*“The United States is committed to strengthening our energy security and confronting global climate change. And the best way to meet these goals is for America to continue leading the way toward the development of cleaner and more energy-efficient technology.”*



# *2007-2011 Region 10 Strategy*

## *Our Vision:*

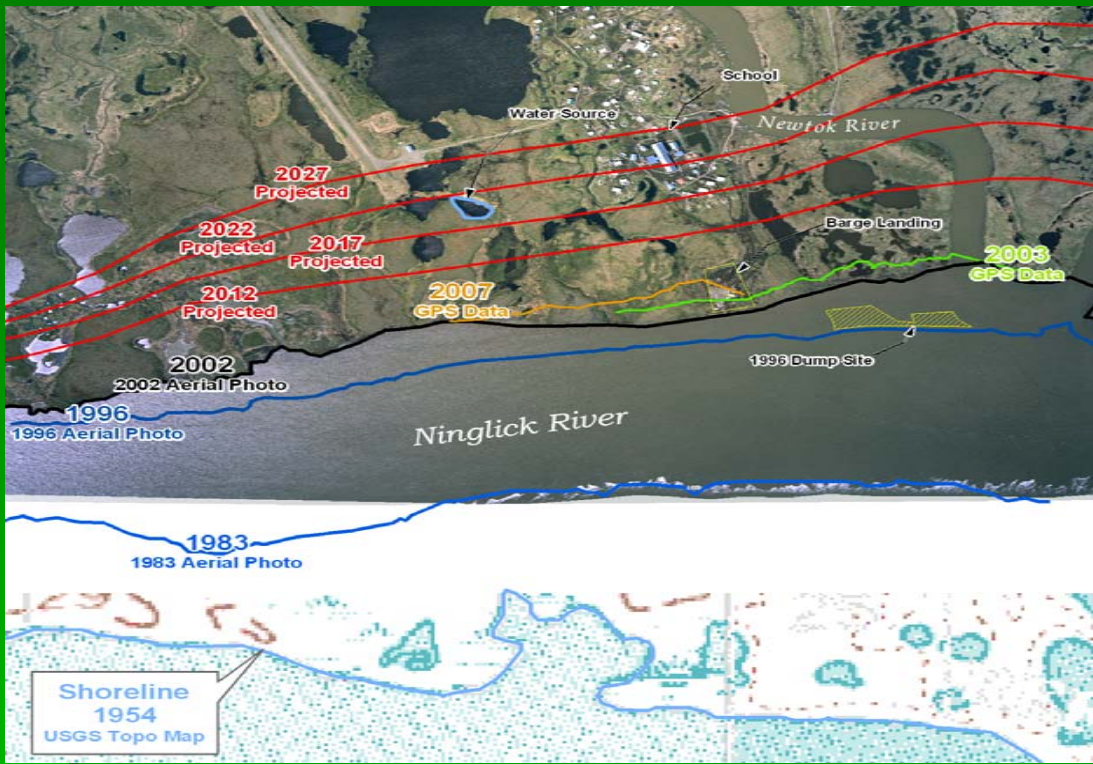
**A Healthy, Sustainable Environment for All**

## *Our Strategic Endeavors:*

- **Stronger EPA**
- **Protecting and Restoring Watersheds**
- **Enhancing Tribal Environments**
- **Support the Core**
- **Sustainability and Strategic Partnerships**
- **Clean Affordable Energy and Climate Change**



<http://yosemite.epa.gov/r10/EXTAFF.NSF/Reports/07-11+Mission>





# USCAP

United States  
Climate Action  
Partnership



Boston  
Scientific



CATERPILLAR

ConocoPhillips



Duke  
Energy



e  
ENVIRONMENTAL DEFENSE  
Finding the ways that work

Exelon



Johnson & Johnson

MARSH



NRG

The Nature  
Conservancy



PG&E Corporation

PNN Resource

RIO  
TINTO



SIEMENS



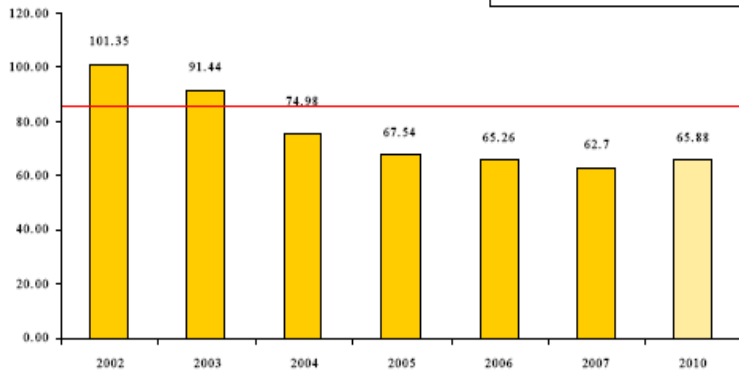
XEROX

# Climate Leader: Caterpillar

## Reducing Green House Gases From Operations

- 35% reduction from 1990-2002 (over 450,000 tons CO<sub>2</sub> equiv.)
- Climate Leaders Goal : -20% by 2010
- Internal Goal: - 35% by 2010
- Achieved & maintained during strong growth
- Transition to absolute GHG goals

Greenhouse Gas Intensity  
(MTCO<sub>2</sub>-eq/\$M)



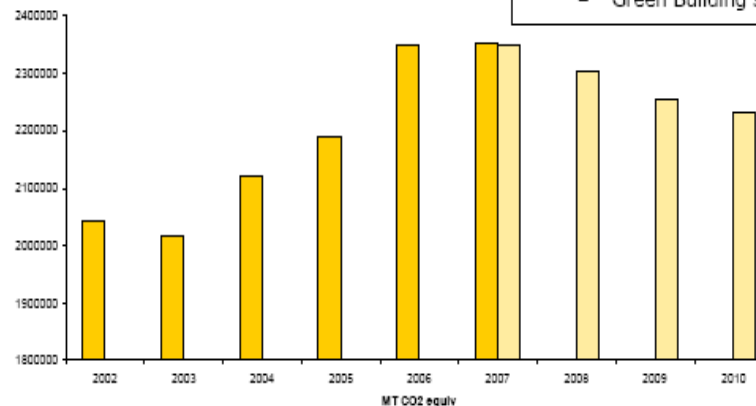
## Absolute GHG Emissions

### Operations Performance – GHG Emissions

- Increased reporting 100 – 220 facilities
- Improved accuracy of reporting
- Significant production growth
- 2007 Absolute emissions flat
- 2010 -5% absolute from 2006 base
  - Energy Efficiency
  - Renewable / Alternative energy
  - Green Building standards

Absolute GHG Emissions

Actual Abs GHG Current Cat Target



**CATERPILLAR**  
TODAY'S WORK. TOMORROW'S WORLD.™

Trade Secrets, Proprietary and/or Company Confidential  
Information Subject to Protection Under 65 C.F.R. 2.203(b)



## GHG Intensity



# Impacts of Climate Change on Washington's Economy

Table 1-1. Recent and Projected Temperatures for the Pacific Northwest

	1970-99	2020s	2040s
Annual (increase)	47.0° F	48.9° F 1.9° F	49.9° F 2.9° F
Oct.-Mar. (increase)	36.1° F	37.8° F 1.7° F	38.6° F 2.5° F
Apr.-Sept. (increase)	57.9° F	60.0° F 2.1° F	61.2° F 3.3° F

Source: Climate Impacts Group, University of Washington<sup>8</sup>

Notes: Temperatures shown are averages across the Pacific Northwest, and may vary significantly from region to region.

Temperature increases

Snowpack decreases

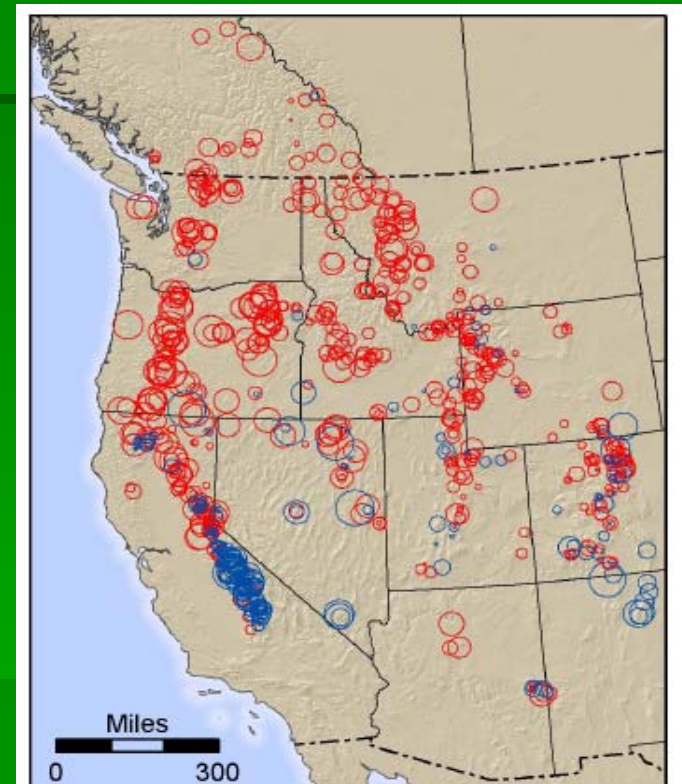


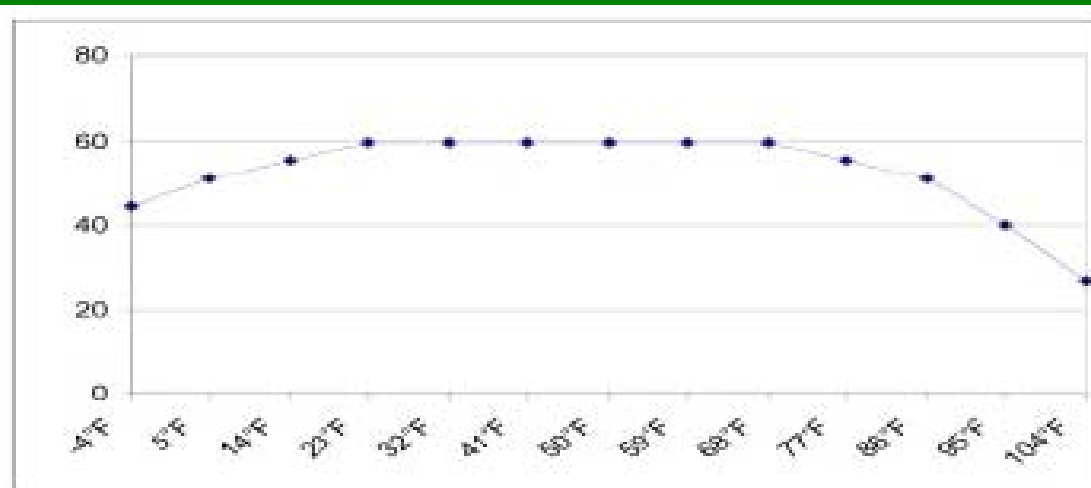
Figure 1-5. Mountain Snowpack Across the West 1950-2000

Source: Casola et al., 2005, redrawn from Mote et al., 2005.<sup>15</sup> Red circles

indicate locations where a decline in April 1 snow water equivalent (SWE) has been recorded relative to 1950; blue circles indicate locations where an increase in April 1 SWE has been recorded. SWE measures the quantity of water contained in snowpack if it were melted instantaneously.







**Figure 2-7. Milk Production (pounds per day) at Various Sustained Ambient Temperatures**

Estimates assume a 1300-lb cow producing a baseline of 60 lbs/day of 3.7% fat milk.

Source: Adapted from National Research Council (1981).

	Dairy production (as % of current product)	Sales per year (in 2004 \$m)
Yakima—Current	--	\$240
Yakima—2040s	98.0%	\$235
Yakima—2090s	94.5%	\$227

## Decline in Dairy Production

## Grapevine Climate/Maturity Groupings

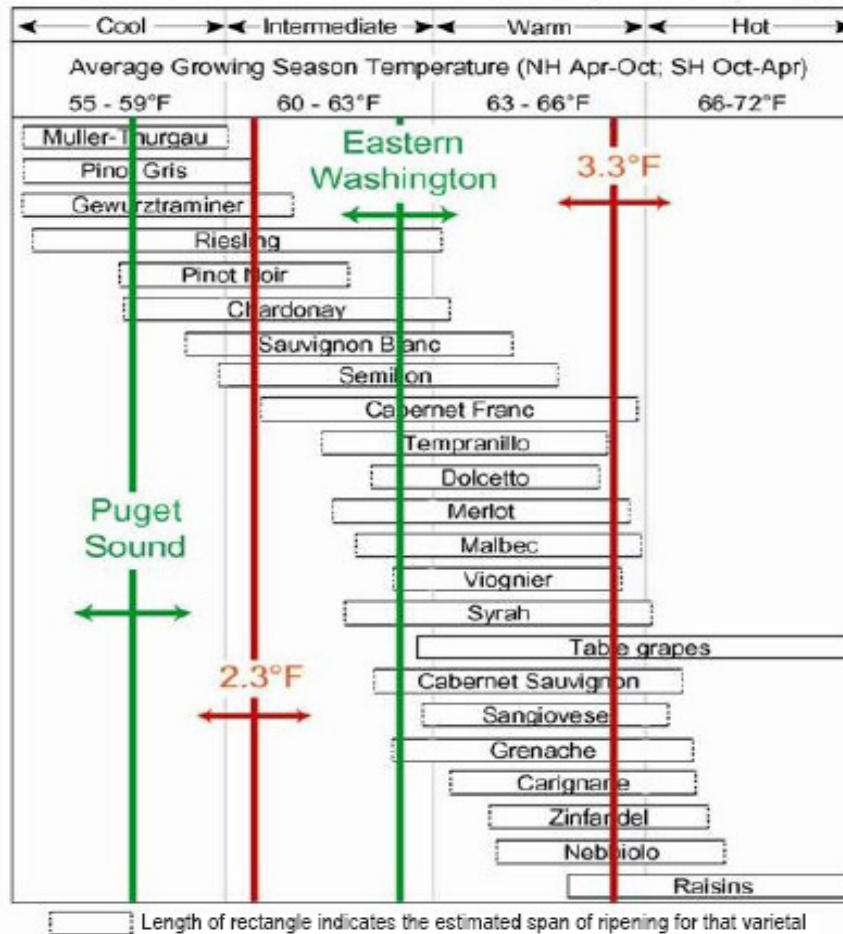


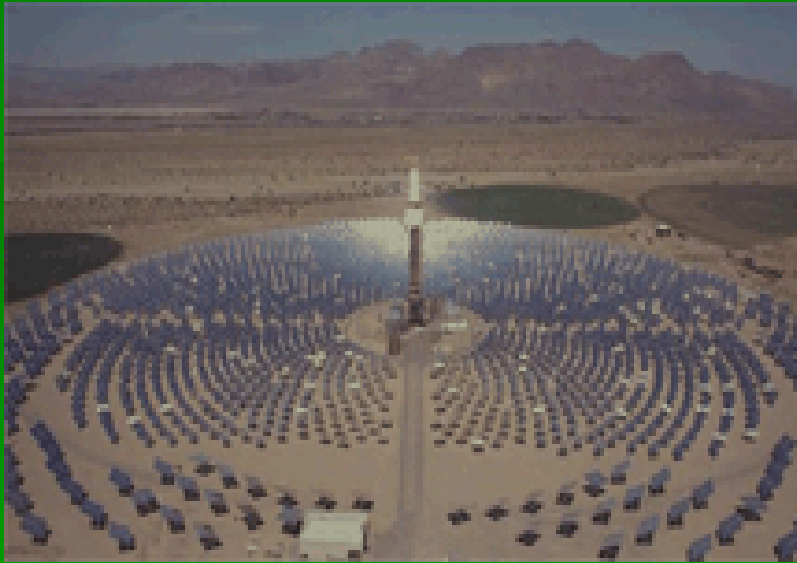
Figure 2-8. Grapevine Climate/Maturity Groupings, With Recent and Projected Ranges for Average Growing Season Temperatures in Puget Sound and Eastern Washington Growing Areas

Source: Gregory V. Jones, Southern Oregon University.<sup>114</sup>

Shifts in Wine Grapes



**Riparian buffer**

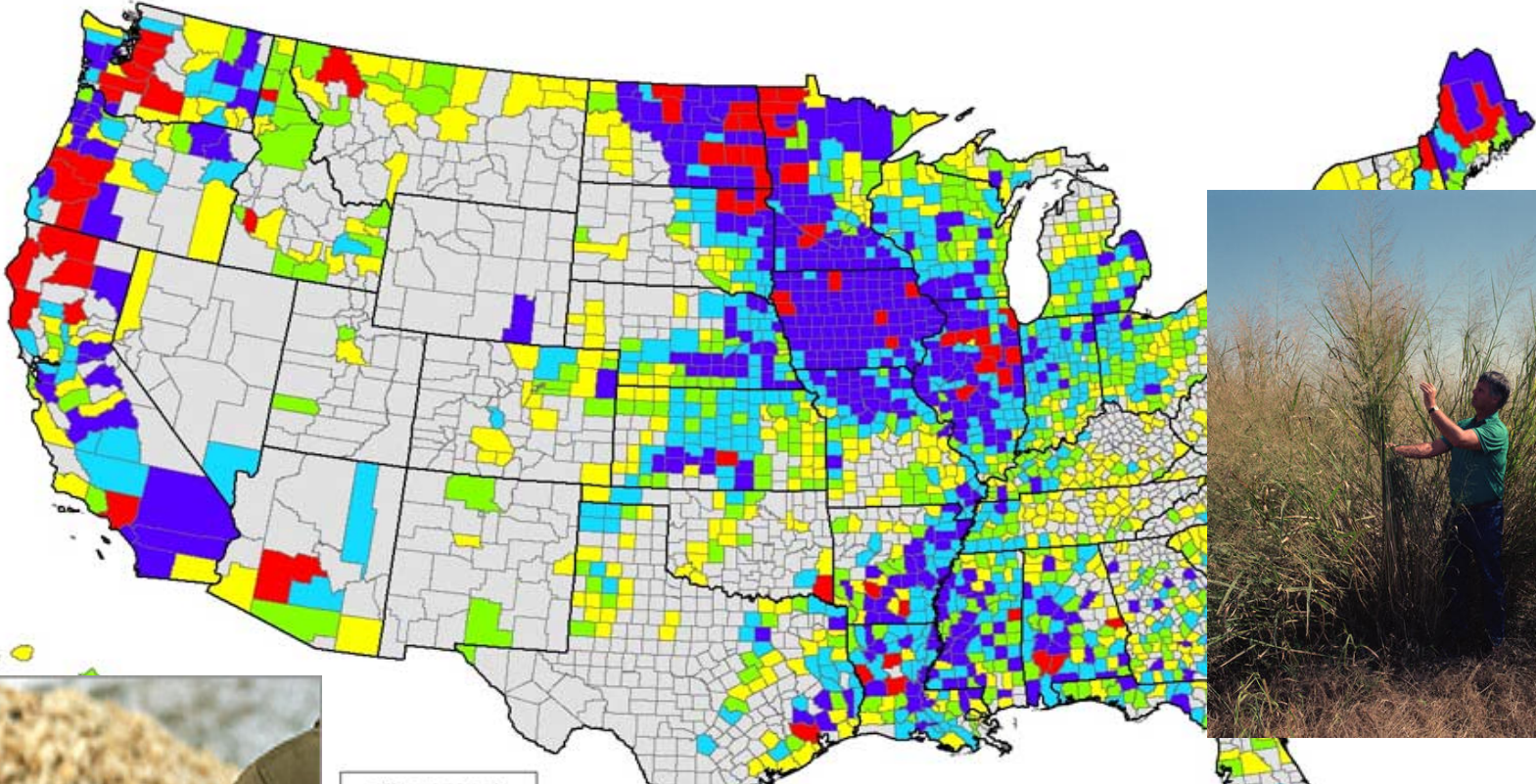


**Renewable energy: Solar and Wind**



**Imperium Grays Harbor Biodiesel Plant**

# Biomass Resources Available in the United States



**Thousand Tonnes/Year**

Red	Above 500
Purple	250 - 500
Cyan	150 - 250
Green	100 - 150
Yellow	50 - 100
Grey	Less than 50

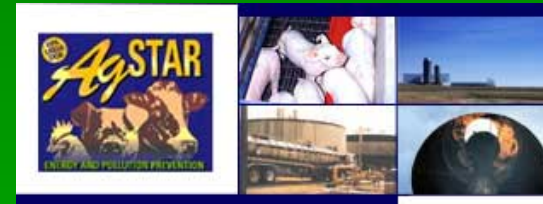


This  
by  
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-D



September 2005

# EPA Voluntary Climate Change Programs



# *For More Information*

- <http://epa.gov/climatechange/index.html>
- <http://www.epa.gov/cleanenergy/>
- <http://www1.eere.energy.gov/informationcenter/>
- [http://www.usda.gov/oce/global\\_change/resources.htm](http://www.usda.gov/oce/global_change/resources.htm)