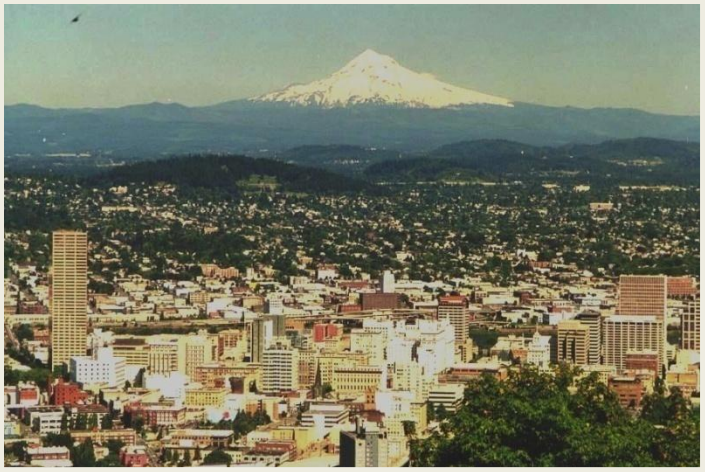
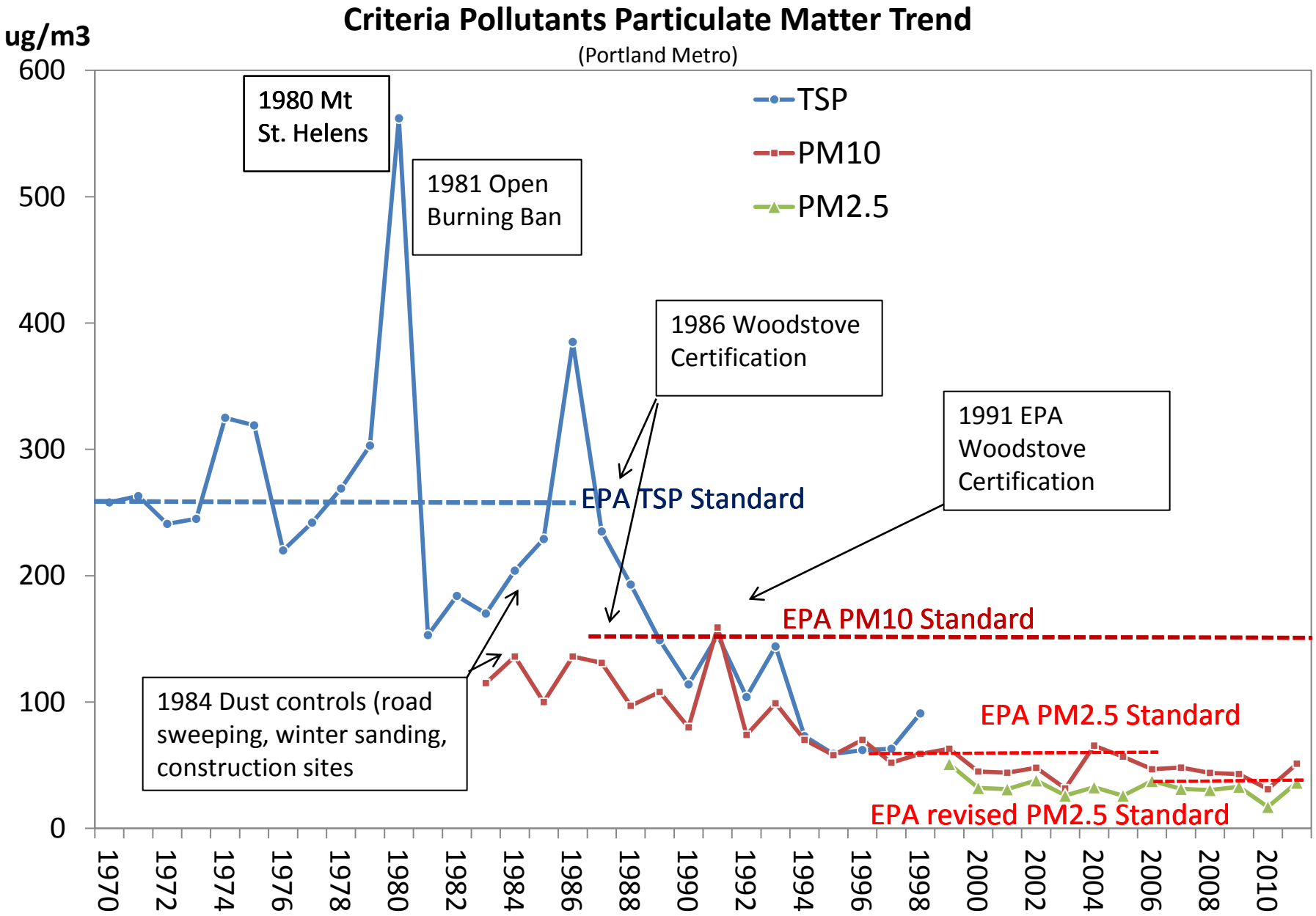
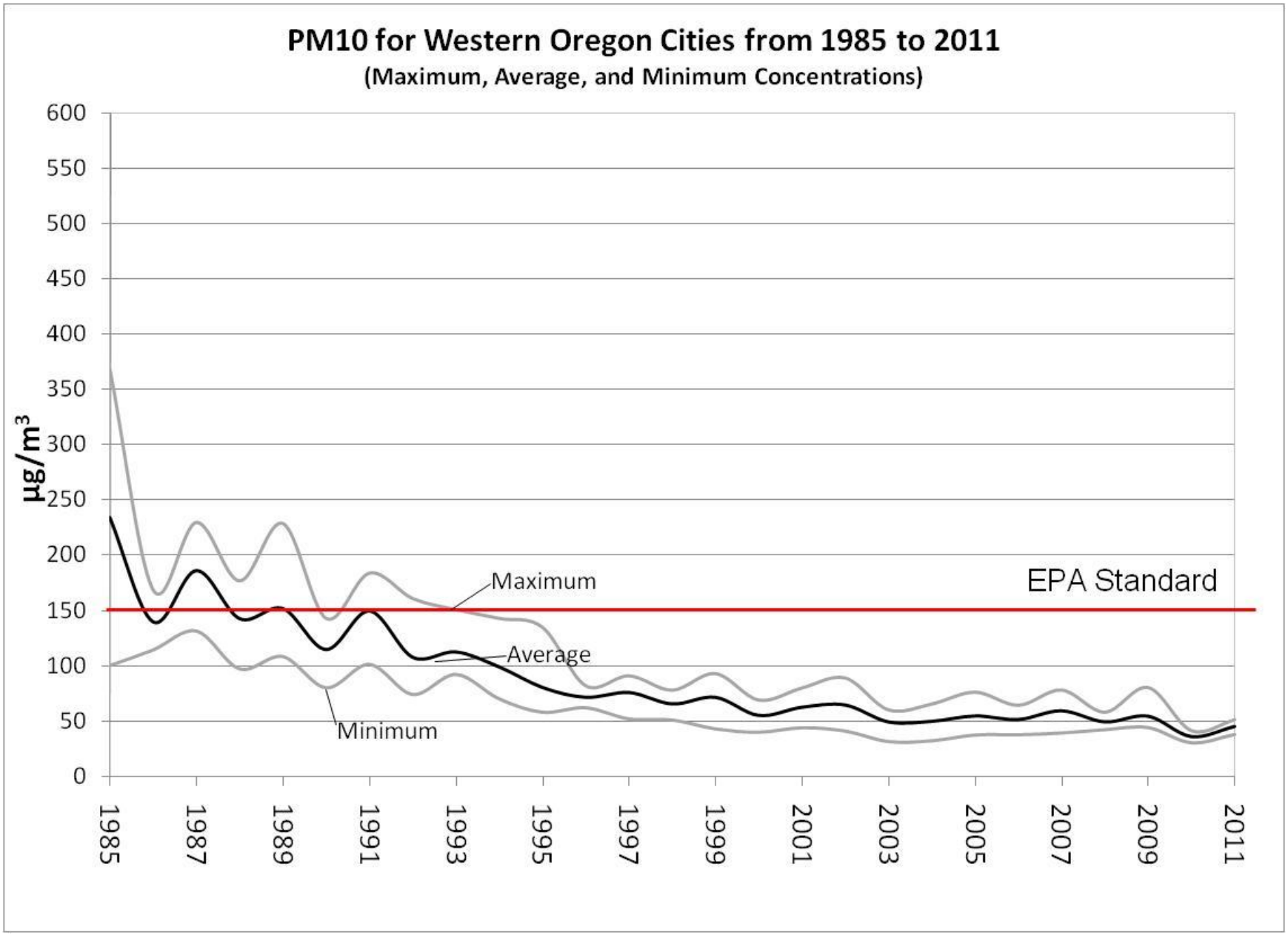
# Oregon's Improving Environment

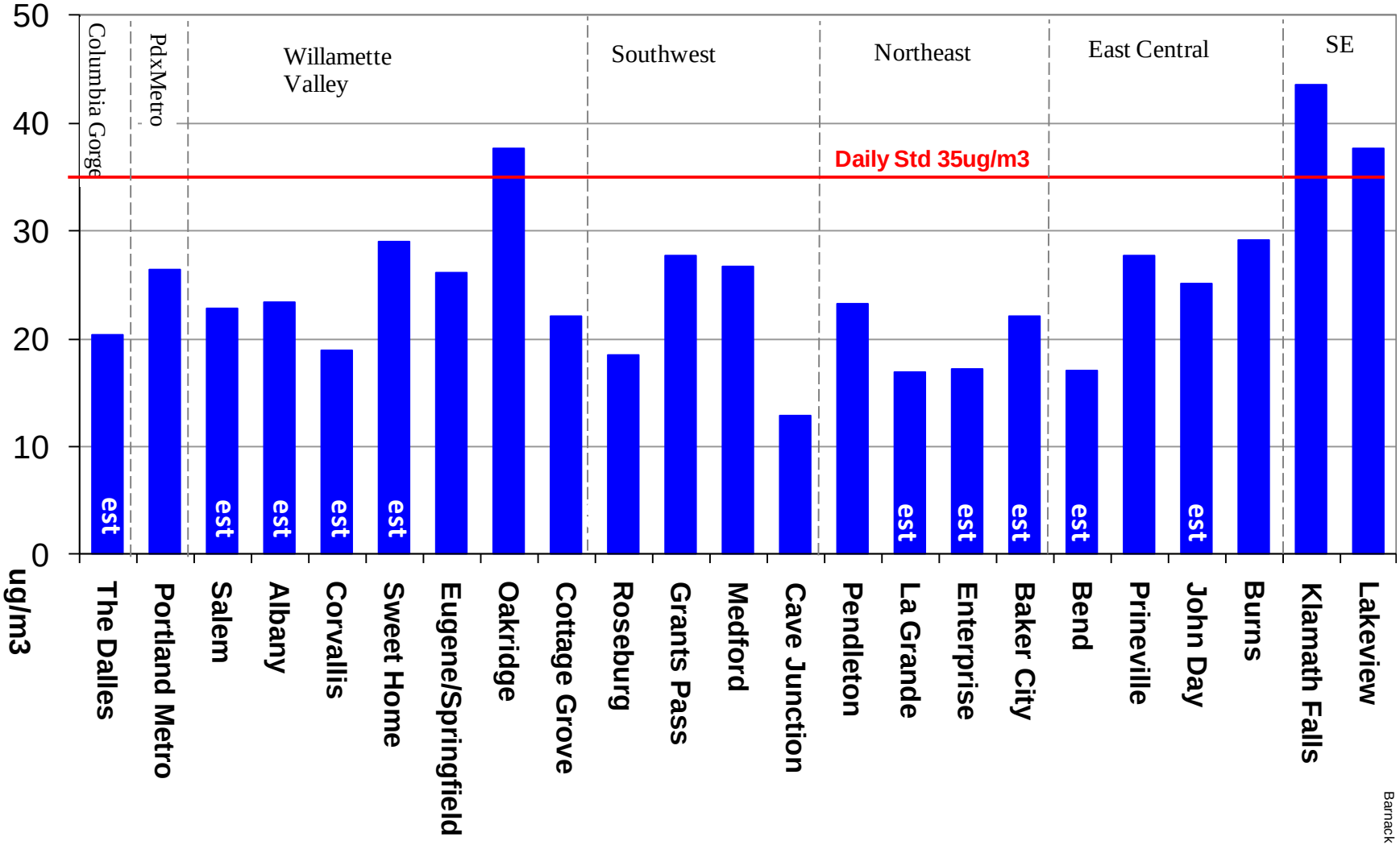


# *Improvements in Air Quality*


Criteria Pollutants Particulate Matter Trend
(Portland Metro)
ug/m3
600
500
400
300
200
100
0
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
TSP
PM10
PM2.5
1980 Mt St. Helens
1981 Open Burning Ban
1986 Woodstove Certification
1991 EPA Woodstove Certification
EPA TSP Standard
EPA PM10 Standard
EPA PM2.5 Standard
EPA revised PM2.5 Standard
1984 Dust controls (road sweeping, winter sanding, construction sites

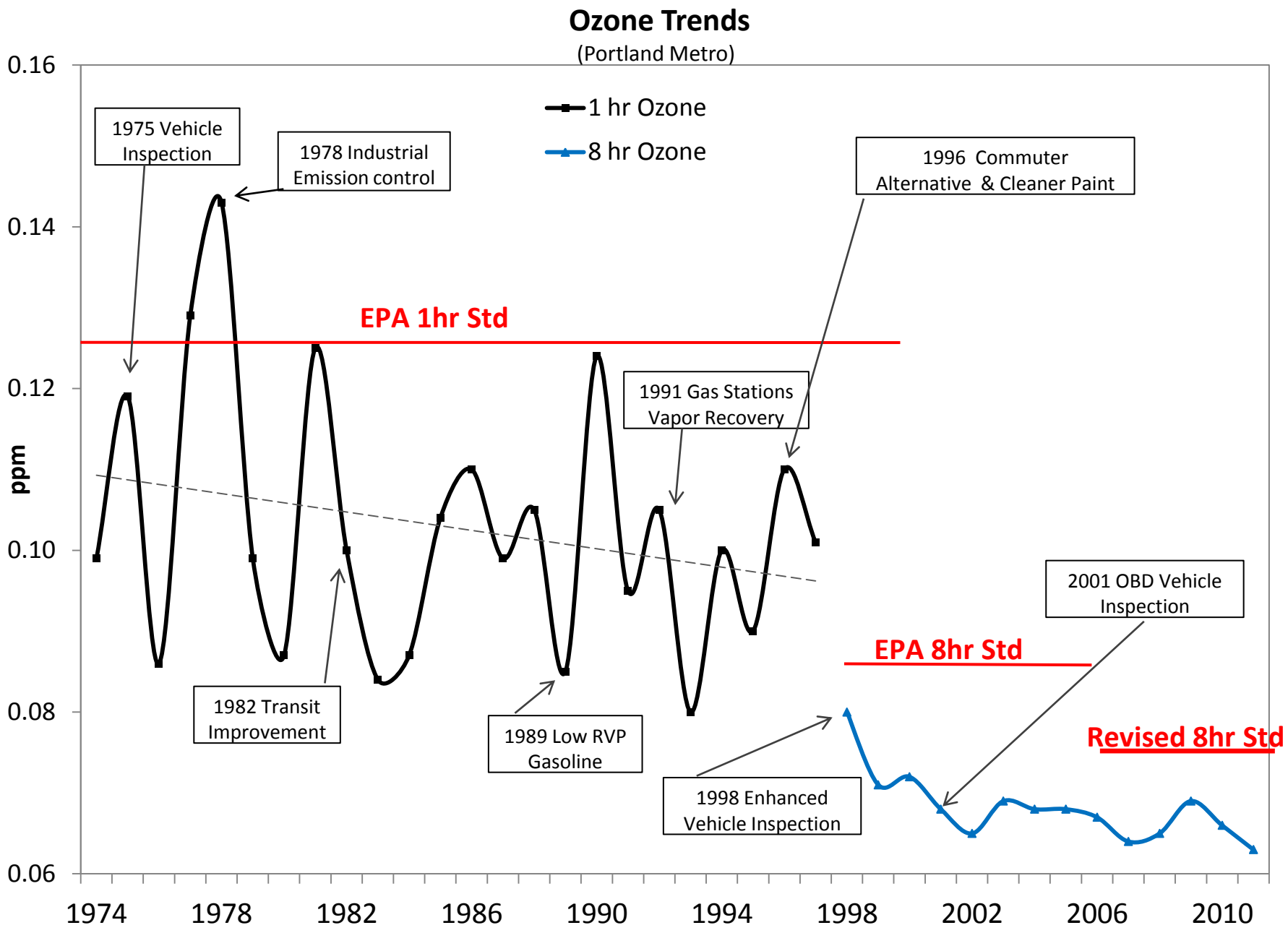

PM10 for Western Oregon Cities from 1985 to 2011
(Maximum, Average, and Minimum Concentrations)
µg/m³
600
550
500
450
400
350
300
250
200
150
100
50
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
Maximum
Average
Minimum
EPA Standard

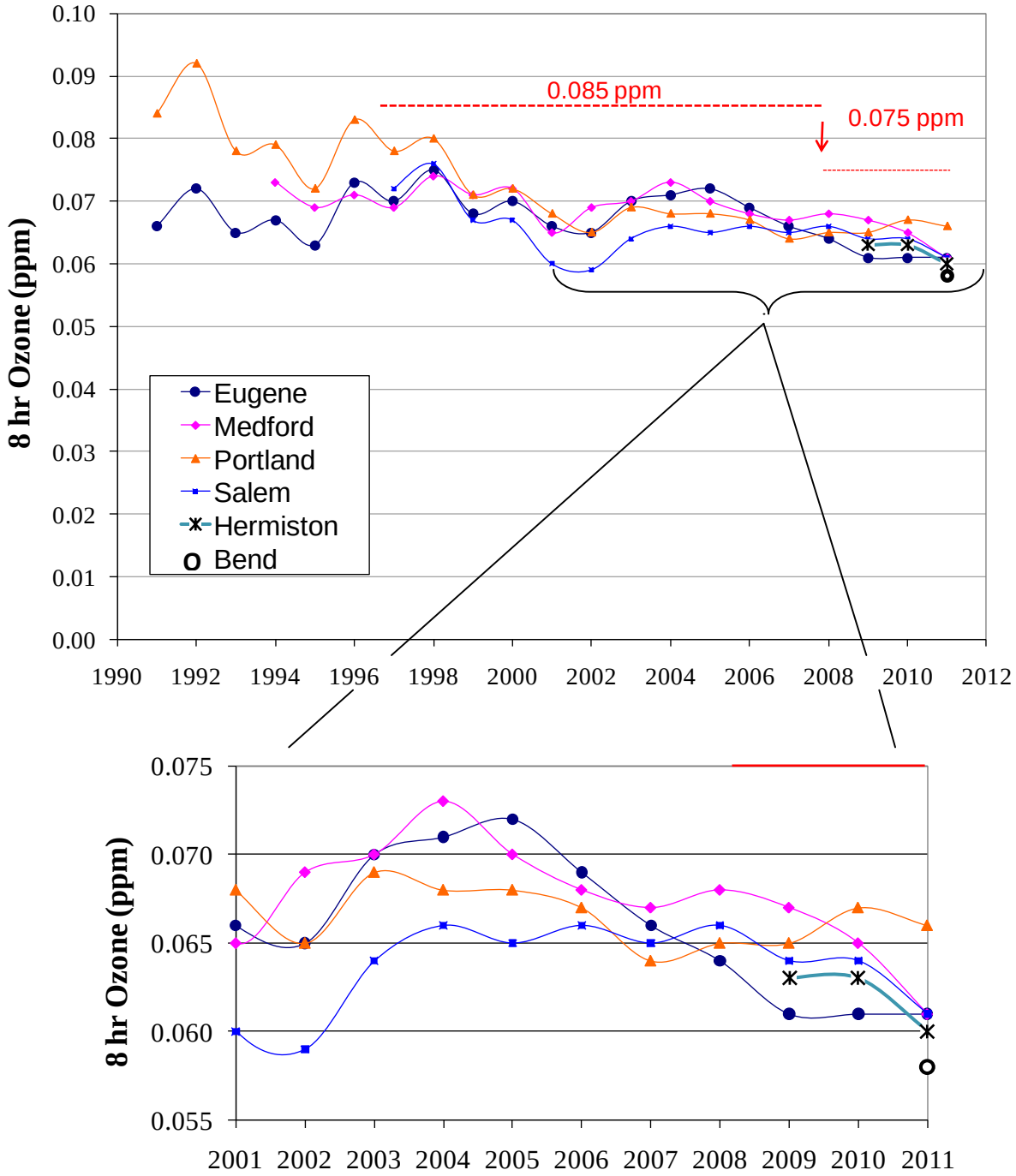
# 2009-2011 Oregon Cities Compared to the New Daily $PM_{2.5}$ Standard

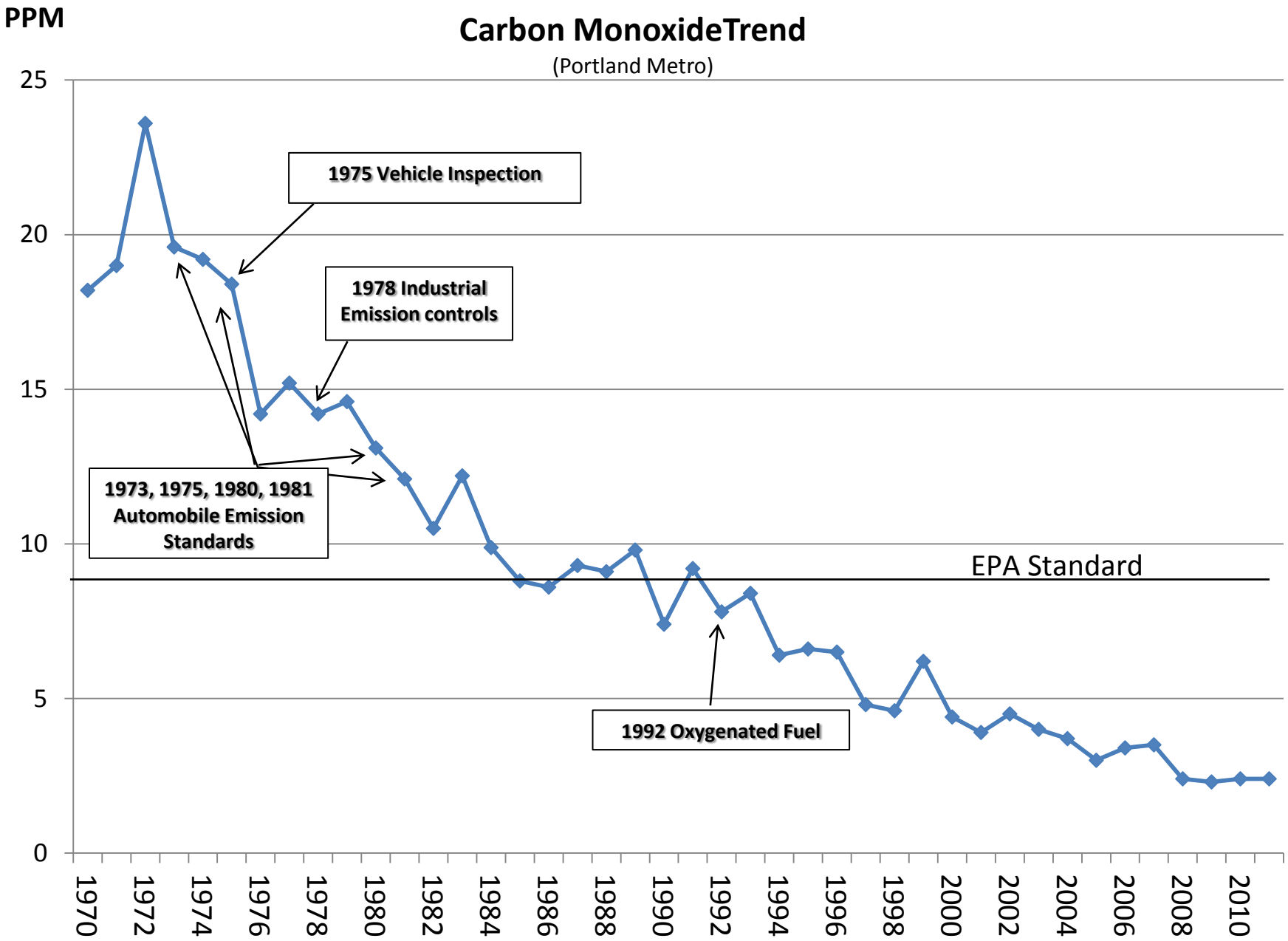


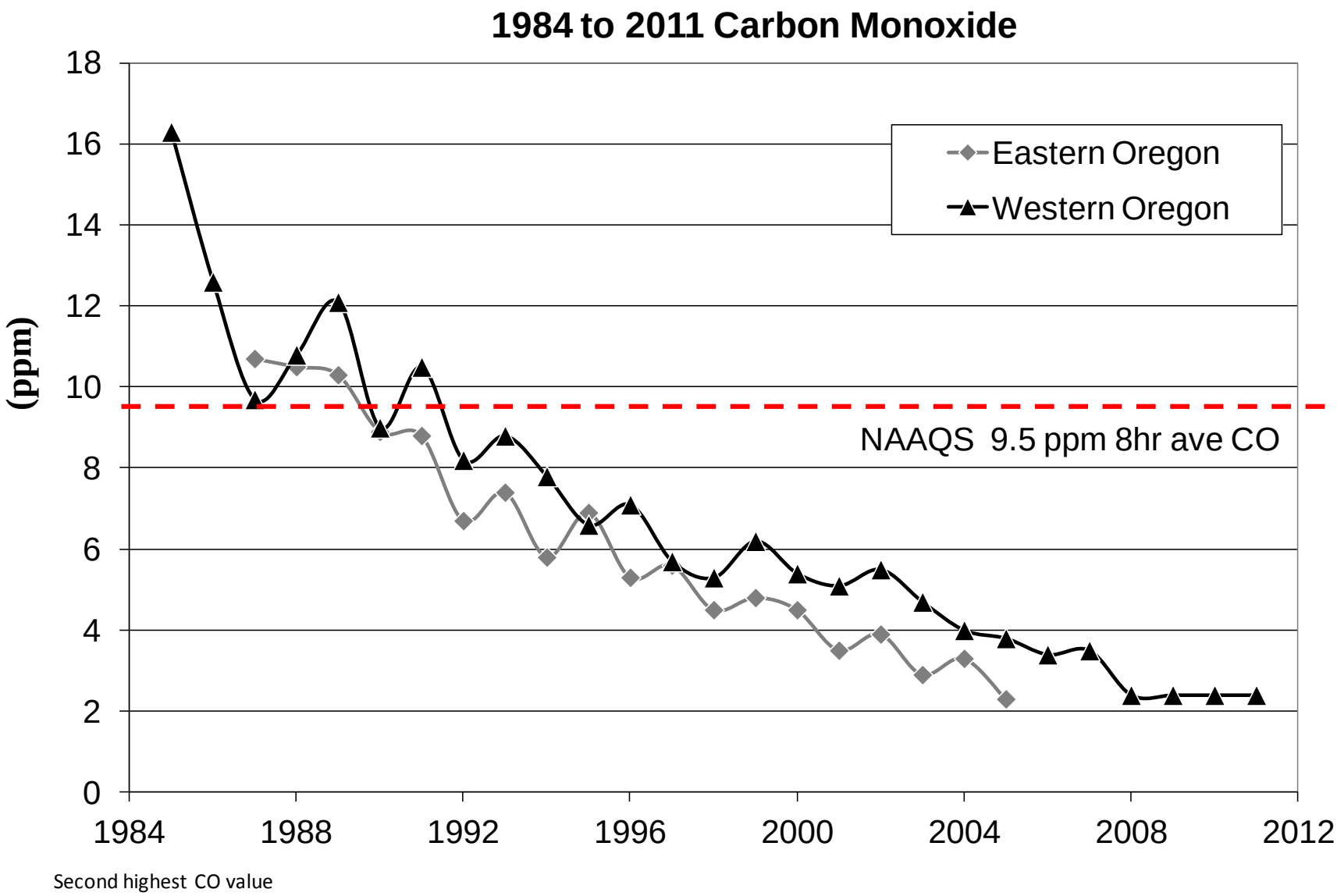

est = Estimated data used to complete the 3yr average

Barnack 2012

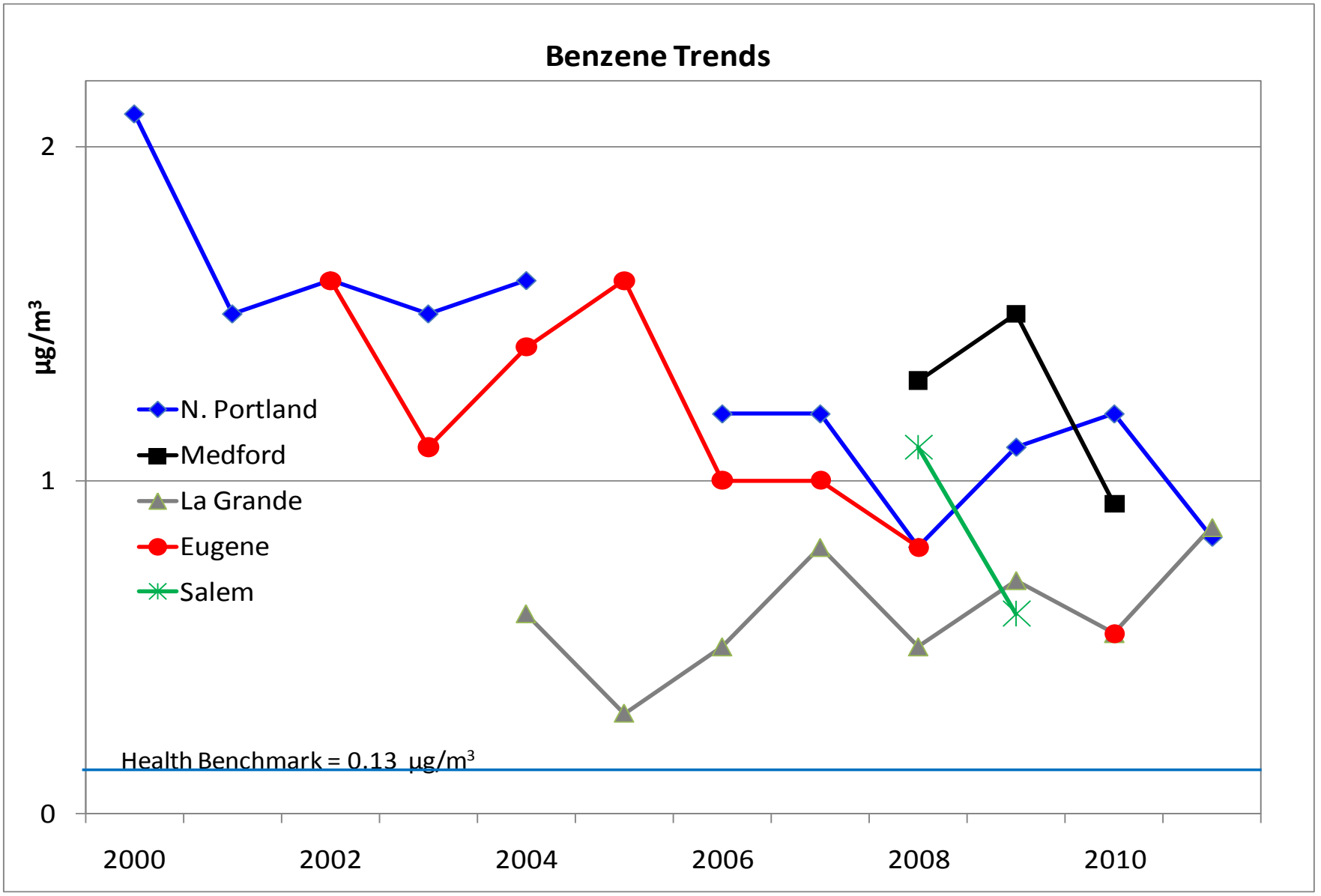

Ozone Trends
(Portland Metro)
1 hr Ozone
8 hr Ozone
1975 Vehicle Inspection
1978 Industrial Emission control
1996 Commuter Alternative & Cleaner Paint
EPA 1hr Std
1991 Gas Stations Vapor Recovery
2001 OBD Vehicle Inspection
EPA 8hr Std
Revised 8hr Std
1982 Transit Improvement
1989 Low RVP Gasoline
1998 Enhanced Vehicle Inspection
ppm
0.16
0.14
0.12
0.10
0.08
0.06
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010

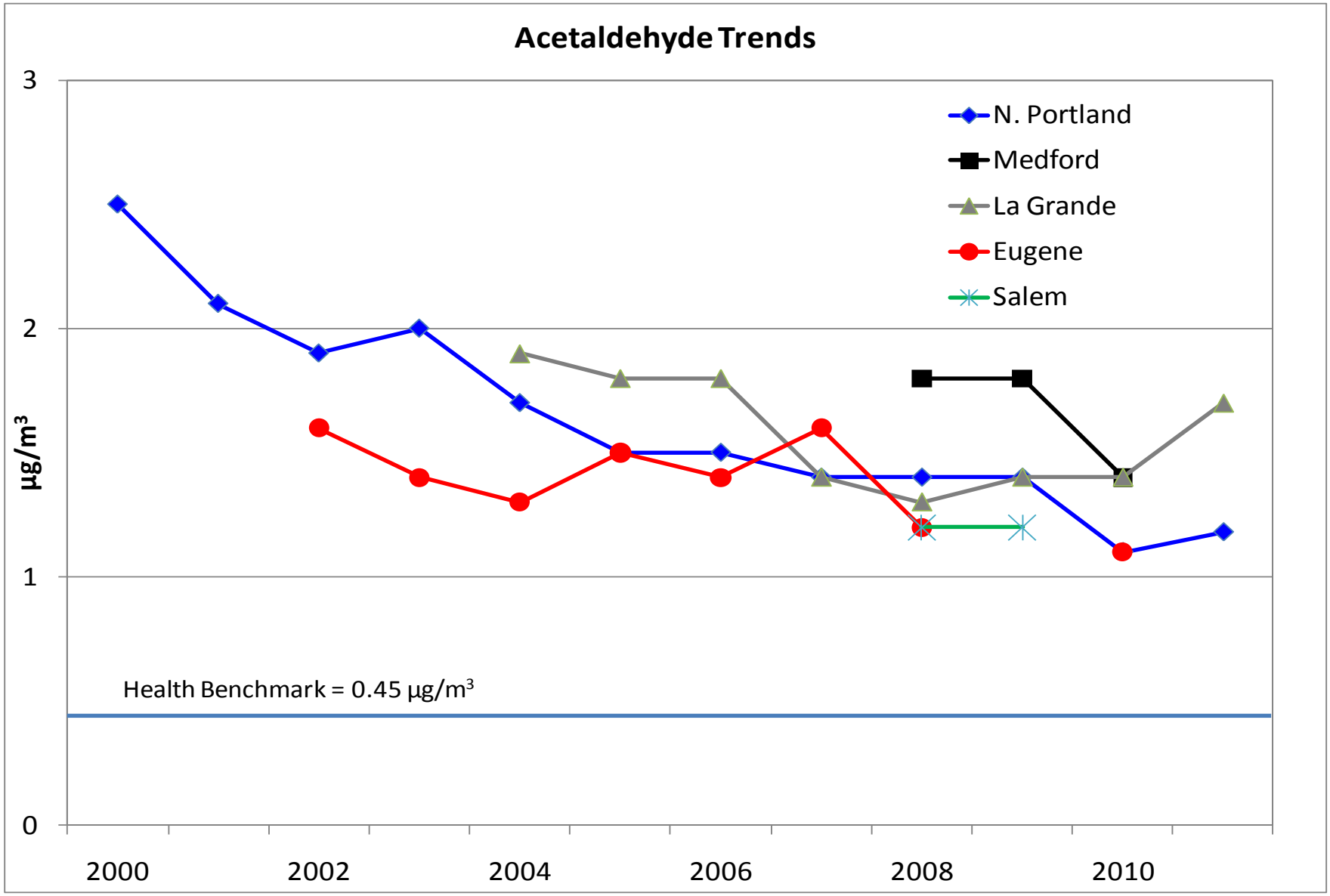

8 hr Ozone (ppm)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.085 ppm
0.075 ppm
Eugene
Medford
Portland
Salem
Hermiston
Bend
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
8 hr Ozone (ppm)
0.075
0.070
0.065
0.060
0.055
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011

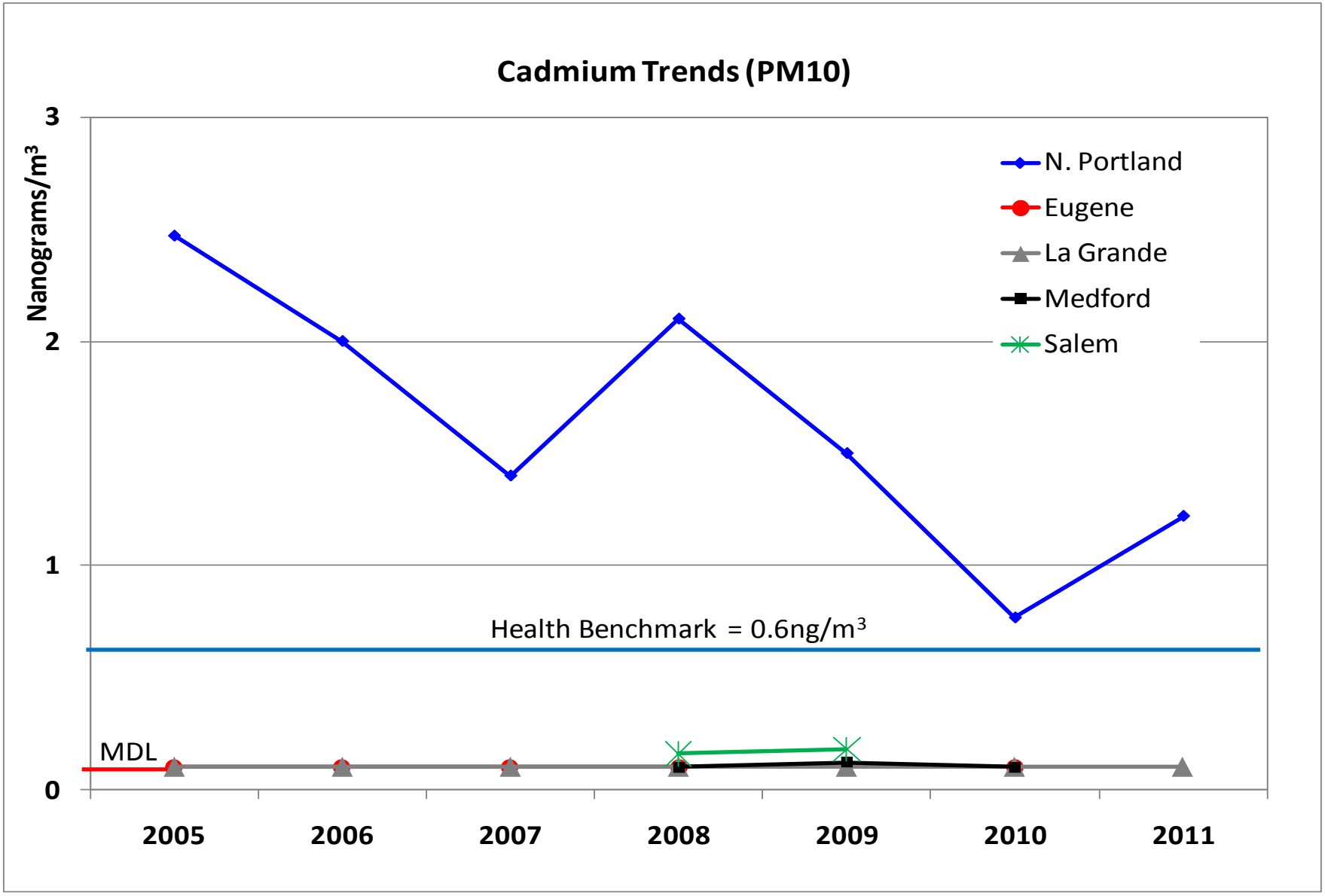

PPM
Carbon MonoxideTrend
(Portland Metro)
25
20
15
10
5
0
1975 Vehicle Inspection
1978 Industrial Emission controls
1973, 1975, 1980, 1981 Automobile Emission Standards
EPA Standard
1992 Oxygenated Fuel
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010

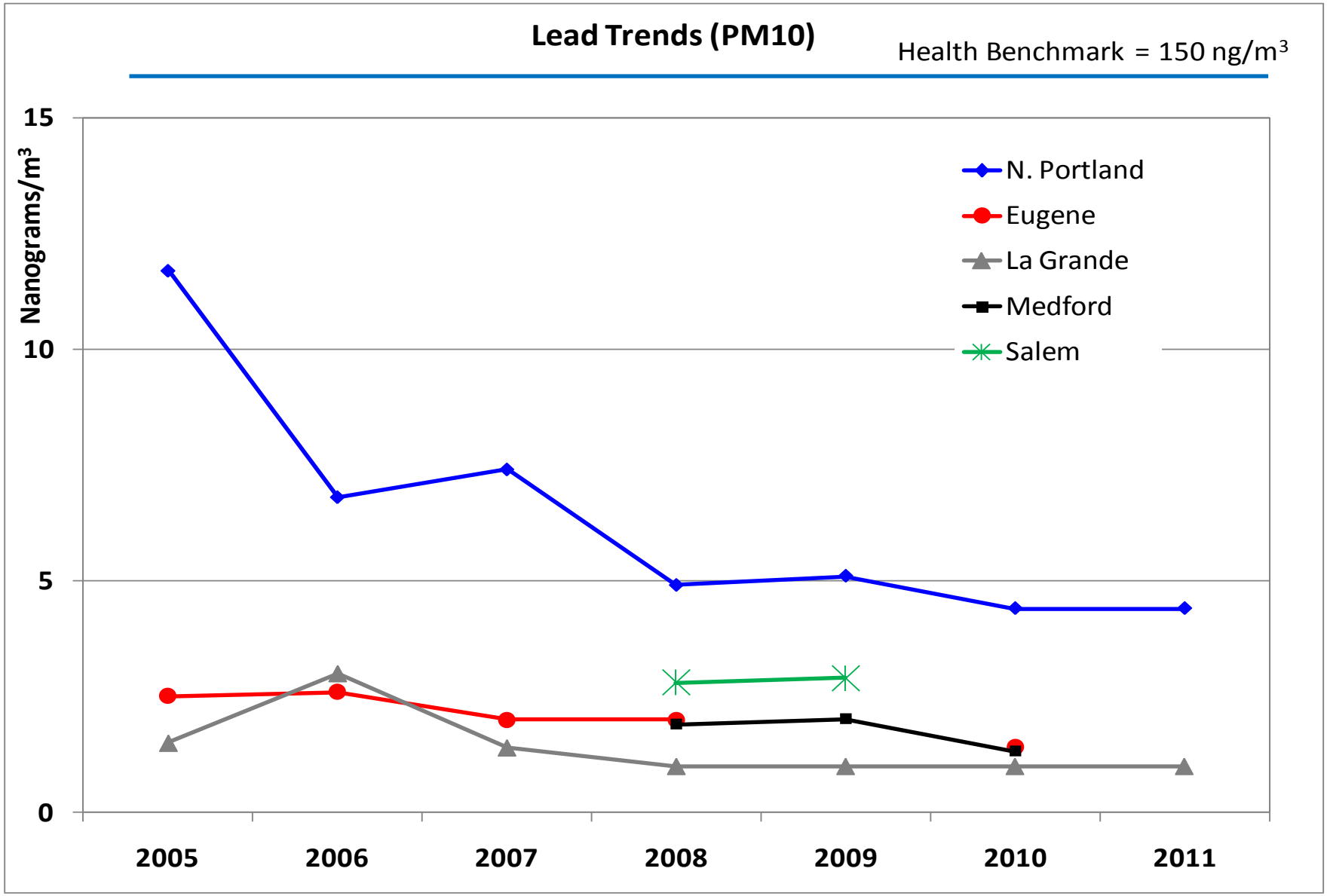



Second highest CO value


Benzene Trends
µg/m³
2
1
0
2000
2002
2004
2006
2008
2010
N. Portland
Medford
La Grande
Eugene
Salem
Health Benchmark = 0.13 µg/m³


Acetaldehyde Trends
3
2
1
0
µg/m³
N. Portland
Medford
La Grande
Eugene
Salem
Health Benchmark = 0.45 µg/m³
2000
2002
2004
2006
2008
2010


Cadmium Trends (PM10)
Nanograms/m³
3
2
1
0
N. Portland
Eugene
La Grande
Medford
Salem
Health Benchmark = 0.6ng/m³
MDL
2005
2006
2007
2008
2009
2010
2011


Lead Trends (PM10)
Health Benchmark = 150 ng/m3
Nanograms/m3
15
10
5
0
2005
2006
2007
2008
2009
2010
2011
N. Portland
Eugene
La Grande
Medford
Salem

# *Improvements in Land Quality*

# *Umatilla Chemical Weapons Destruction*

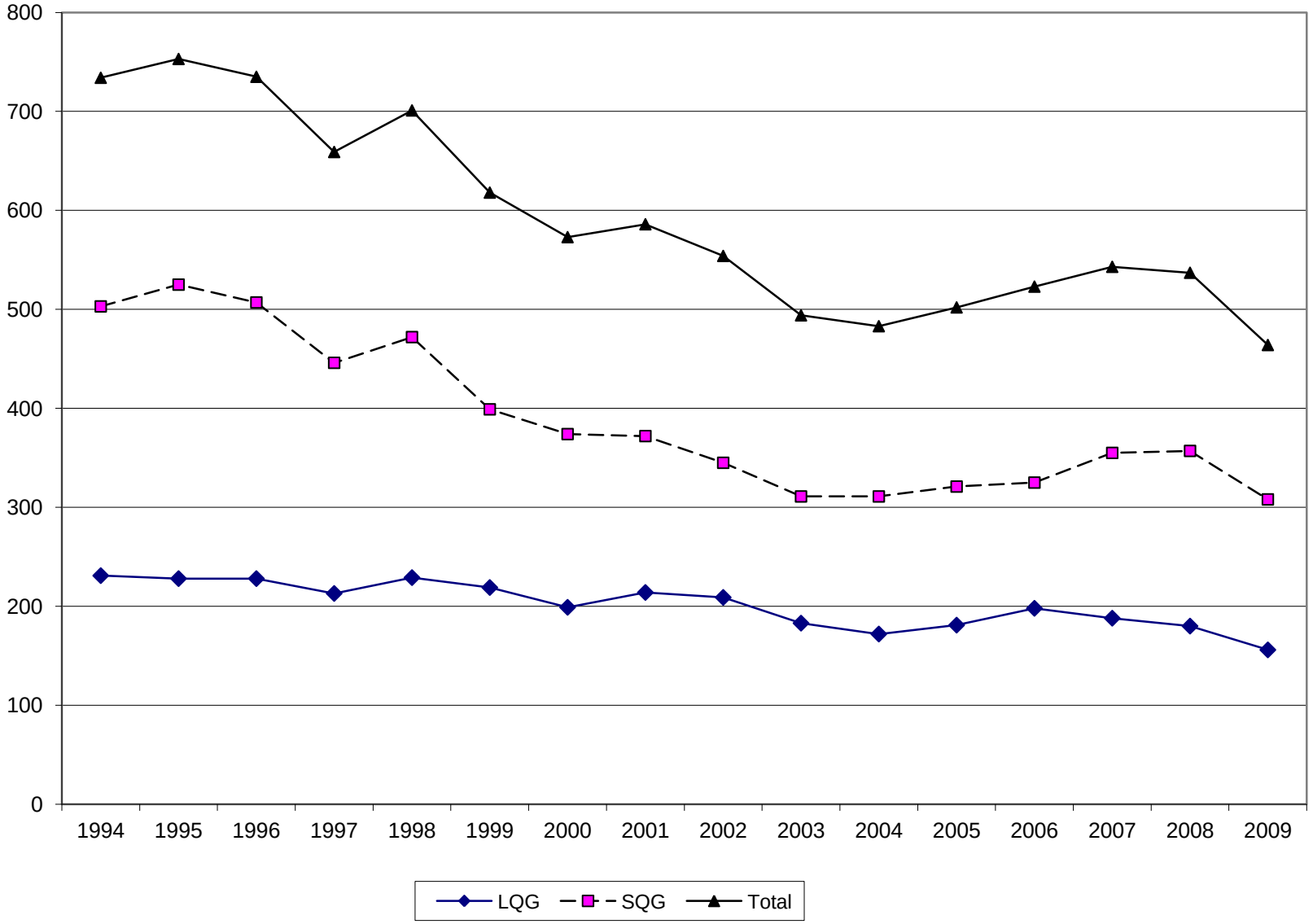
- Stockpiling of chemical weapons began in 1962
- Destruction began in 2004
- All chemical agents destroyed prior to 2012 deadline

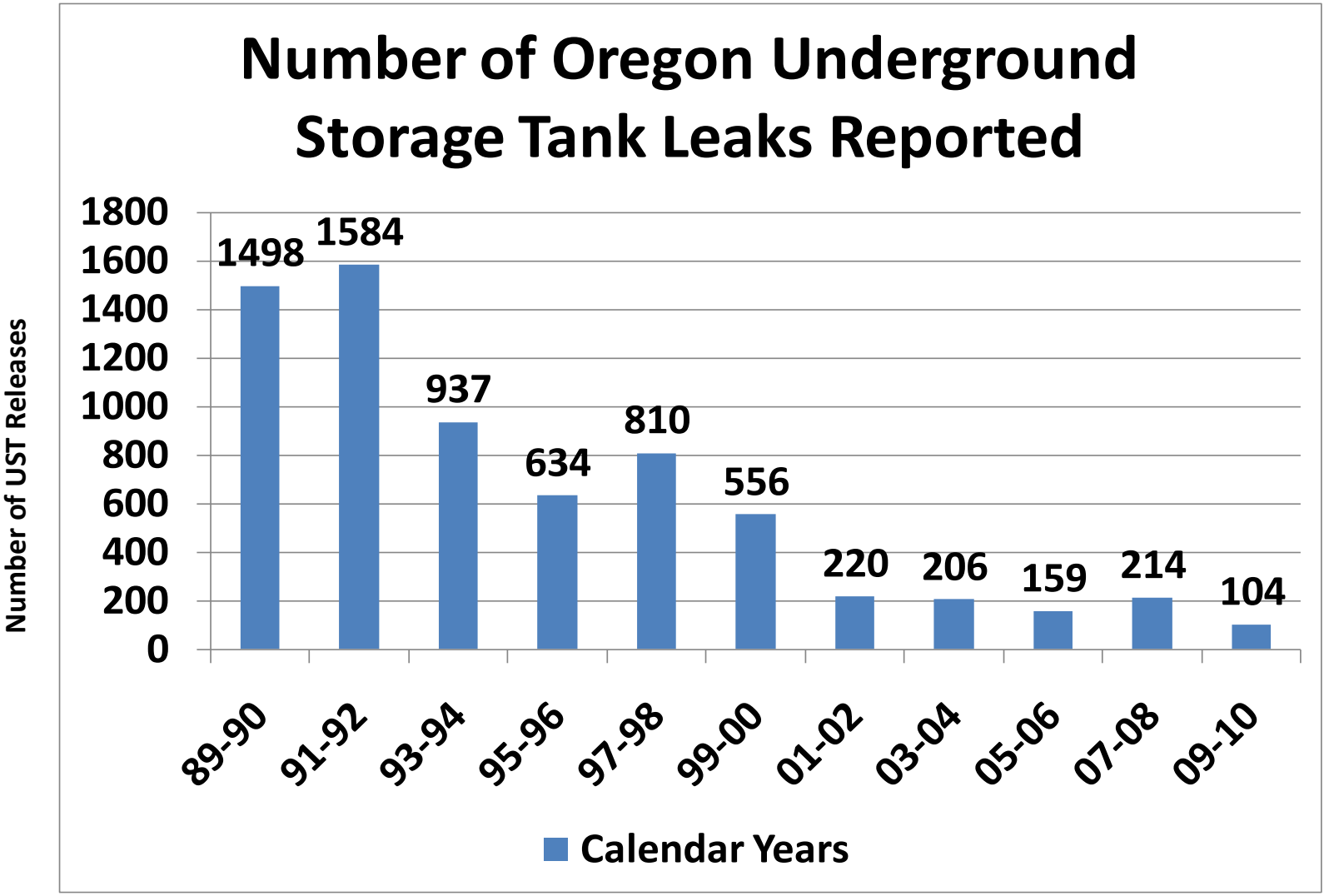
# *Increased Recovery of Materials*

- Recovery of municipal solid waste has grown to 44.7 percent of waste generated in Oregon – nearly 2,000,000 tons per year

- 85 percent of Oregonians have access to at least one household hazardous waste collection service

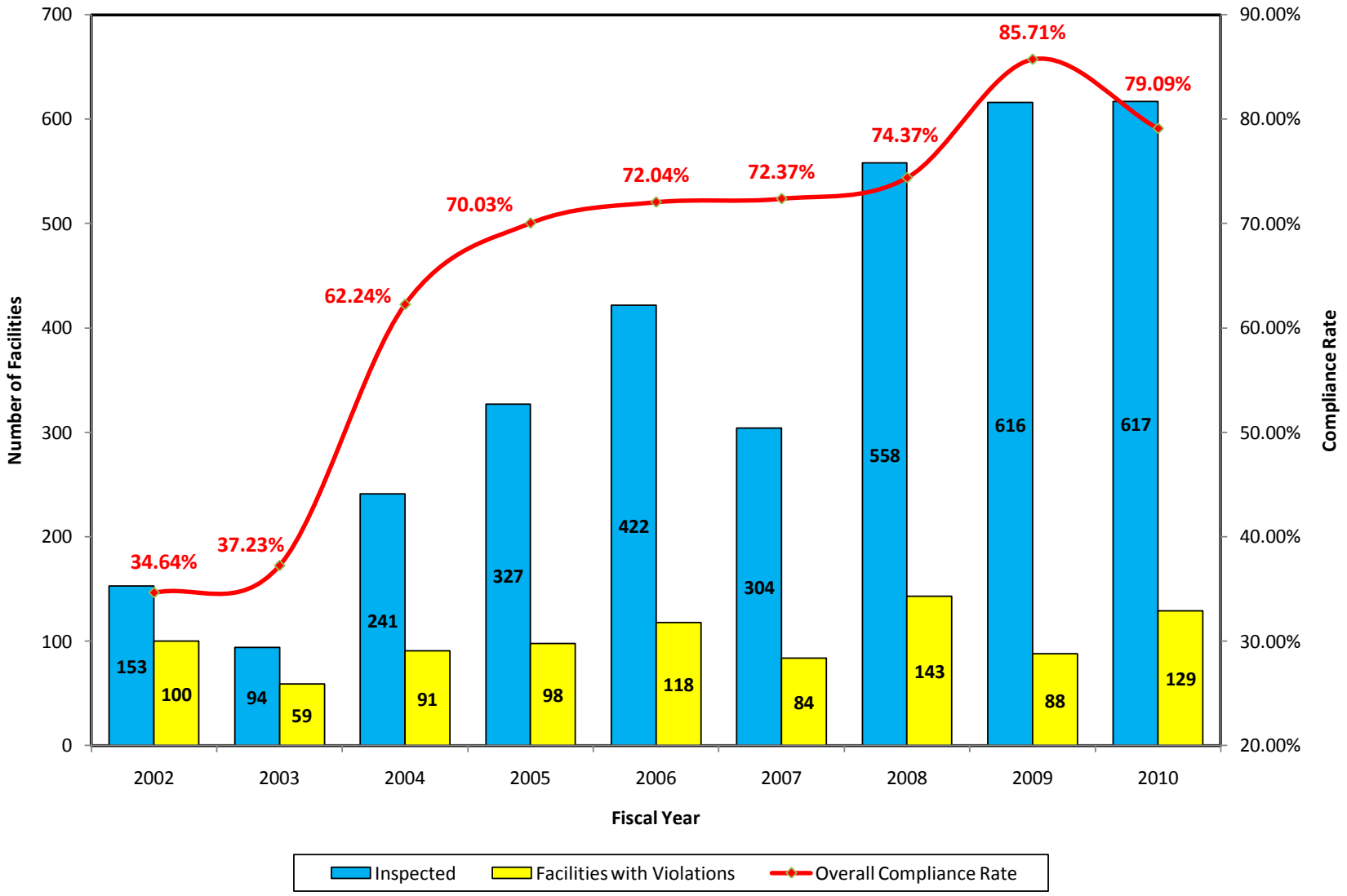
# *Toxics Use Reduction – Decline in Generation of Hazardous Waste*




Number of Oregon Underground Storage Tank Leaks Reported
Number of UST Releases
1800
1600
1400
1200
1000
800
600
400
200
0
1498
1584
937
634
810
556
220
206
159
214
104
89-90
91-92
93-94
95-96
97-98
99-00
01-02
03-04
05-06
07-08
09-10
Calendar Years

# Oregon UST Compliance Rates

** Compliance numbers for FY2002 & FY2003 are estimates*



## *Cleanup and Emergency Response*

Over 30,000 properties contaminated by historic hazardous substance releases have been cleaned up through 2010

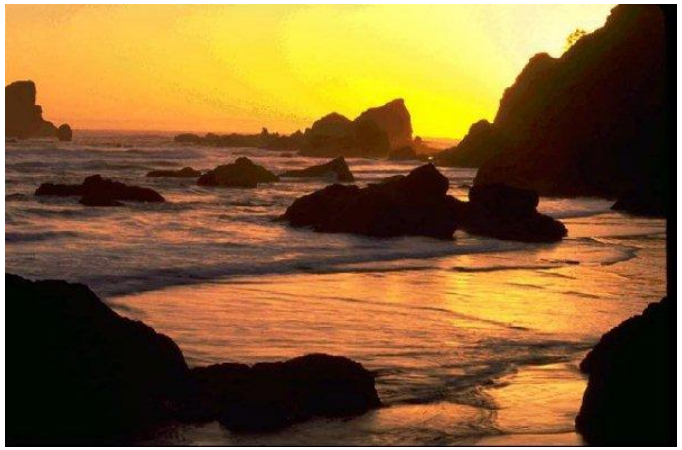
Emergency Response ensures contemporary spills are properly managed and adequately cleaned up

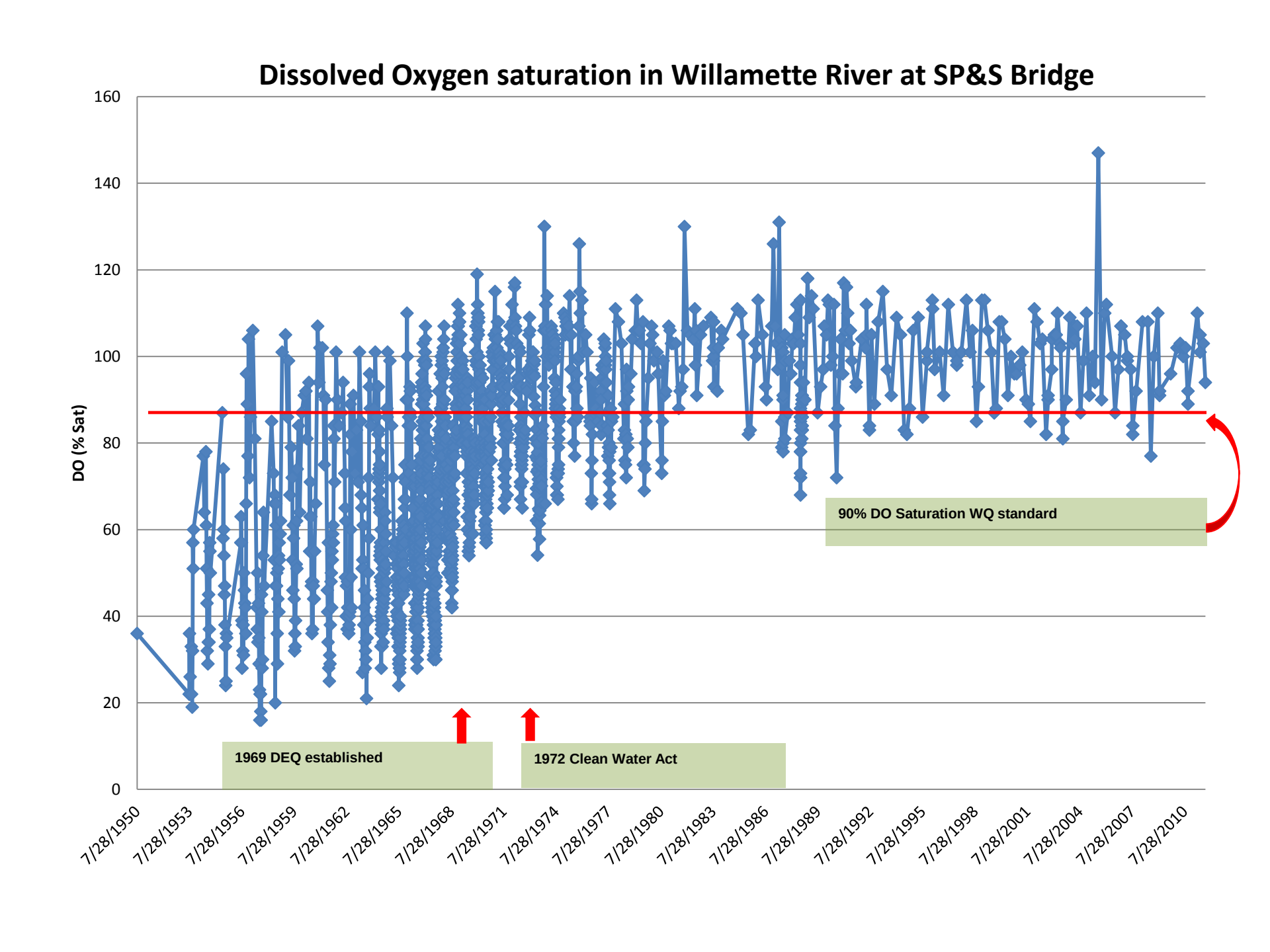
# *Rehabilitation of Brownfields*

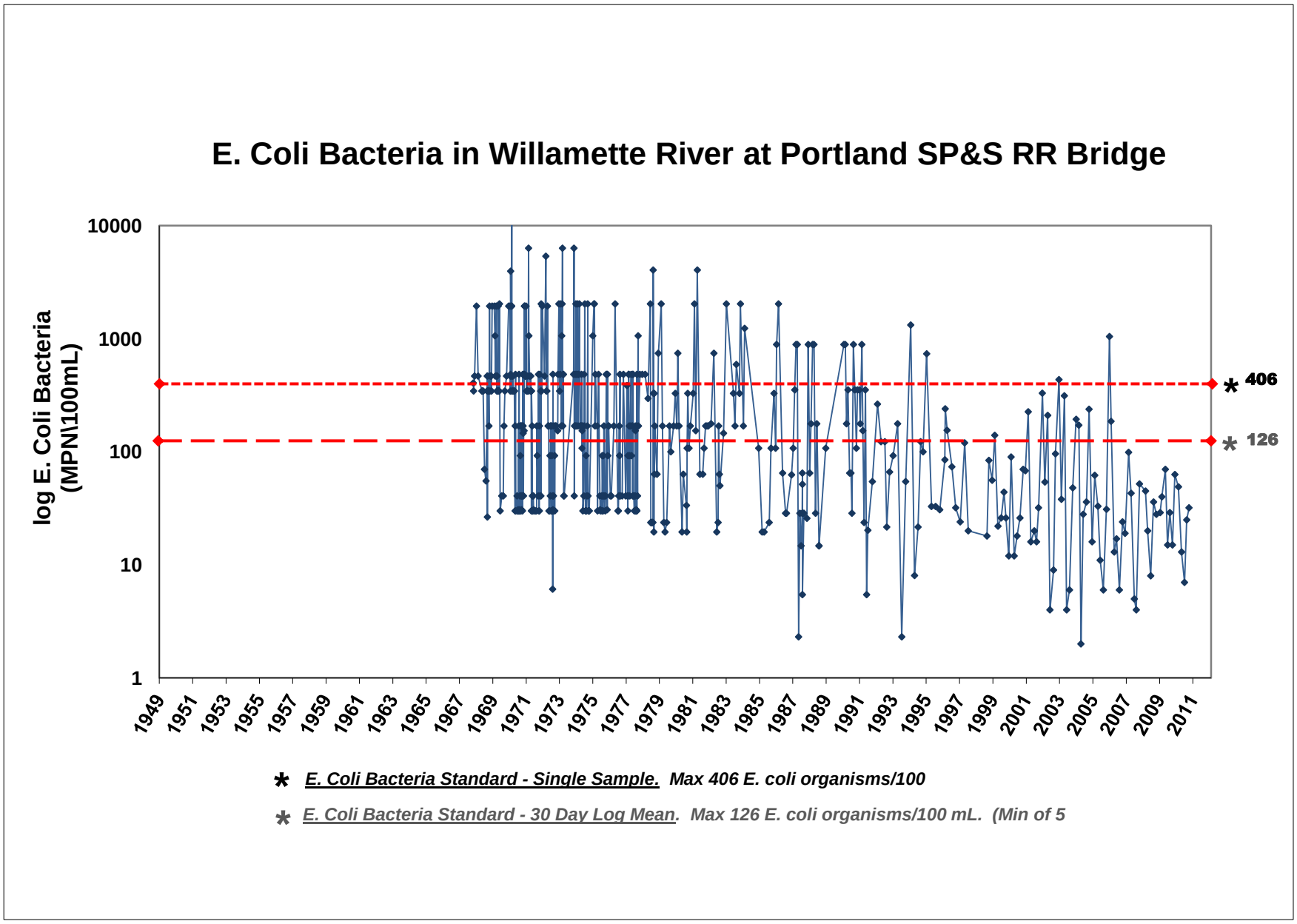
*Hundreds of brownfields in Oregon have been redeveloped*

*Getting properties back into productive use has helped economic revitalization of communities*

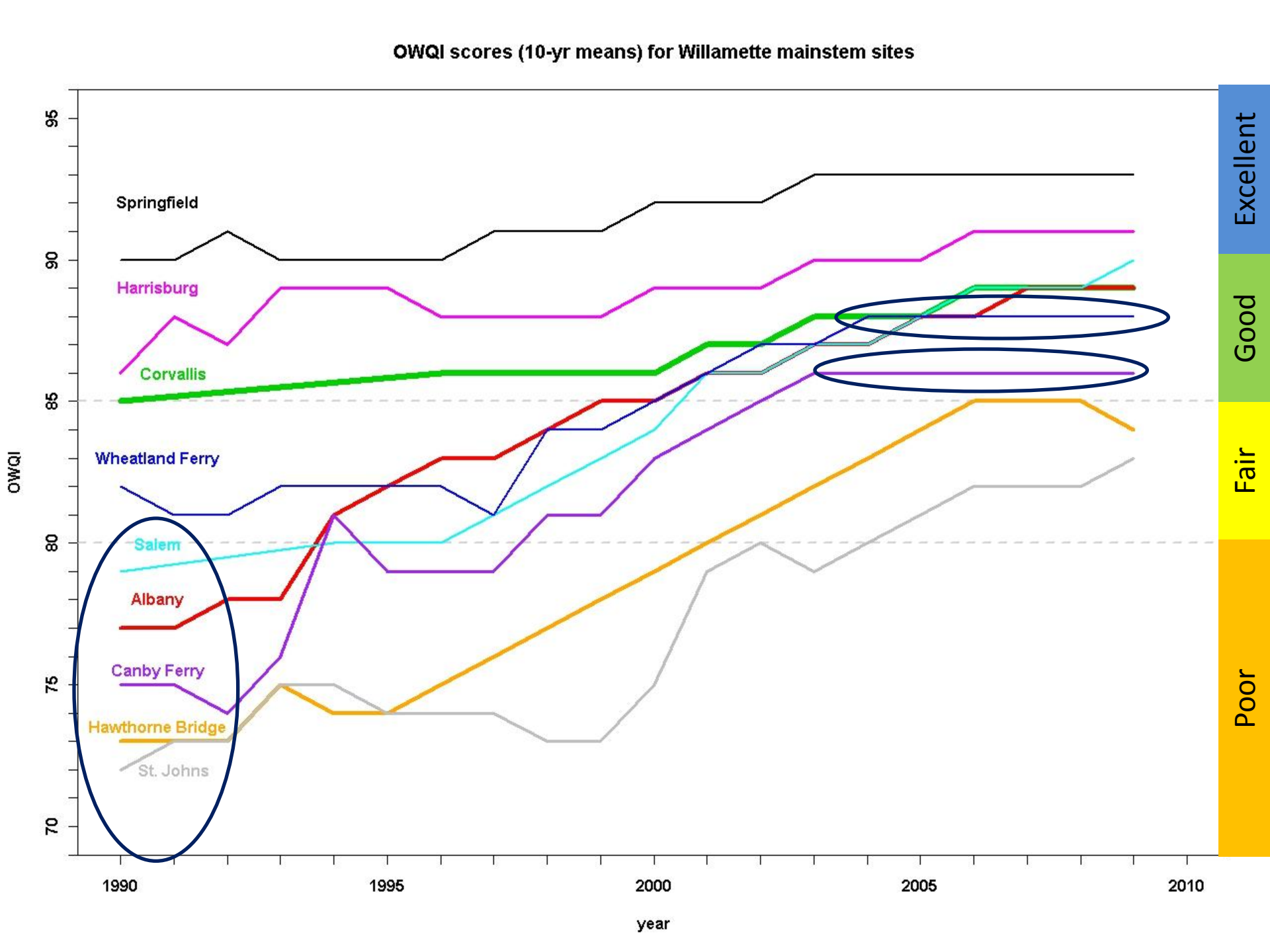
# *Improvements in Water Quality*



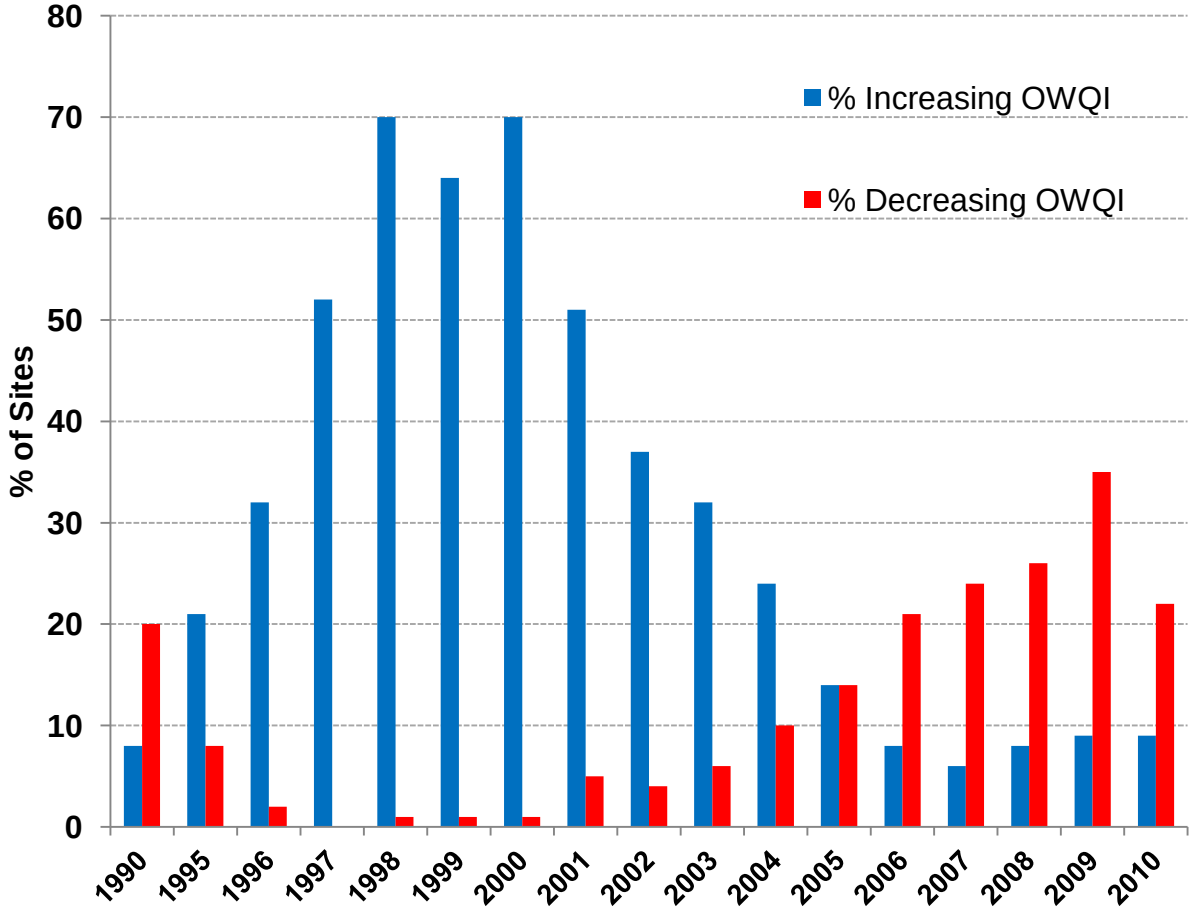

Dissolved Oxygen saturation in Willamette River at SP&S Bridge
DO (% Sat)
160
140
120
100
80
60
40
20
0
7/28/1950
7/28/1953
7/28/1956
7/28/1959
7/28/1962
7/28/1965
7/28/1968
7/28/1971
7/28/1974
7/28/1977
7/28/1980
7/28/1983
7/28/1986
7/28/1989
7/28/1992
7/28/1995
7/28/1998
7/28/2001
7/28/2004
7/28/2007
7/28/2010
90% DO Saturation WQ standard
1969 DEQ established
1972 Clean Water Act




This is editable and now on a log scale

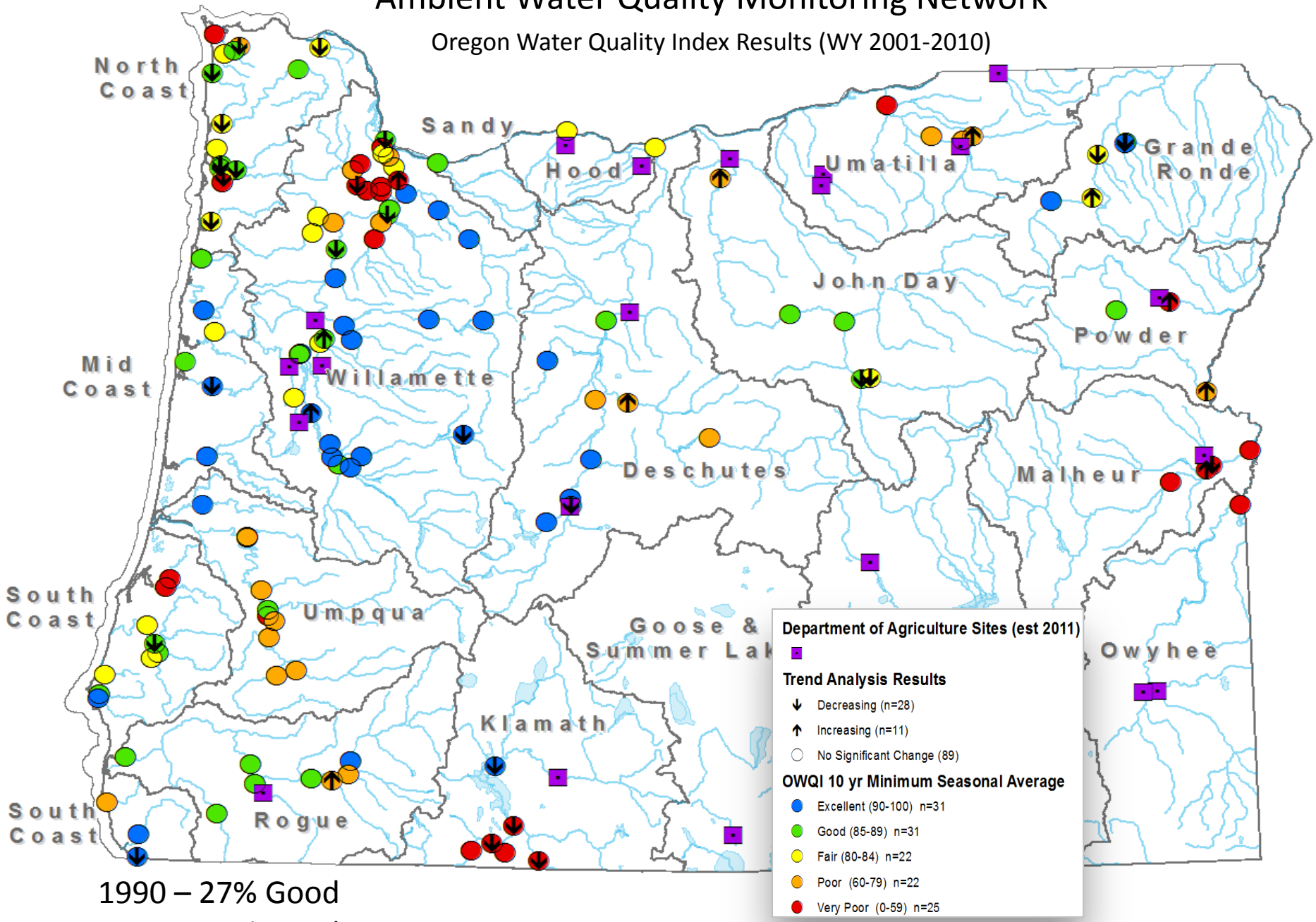

OWQI scores (10-yr means) for Willamette mainstem sites
Springfield
Harrisburg
Corvallis
Wheatland Ferry
Salem
Albany
Canby Ferry
Hawthorne Bridge
St. Johns
Excellent
Good
Fair
Poor
OWQI
95
90
85
80
75
70
1990
1995
2000
2005
2010
year

## *Percent of Sites with Increasing & Decreasing OWQI 10 Year Trends*



# Ambient Water Quality Monitoring Network

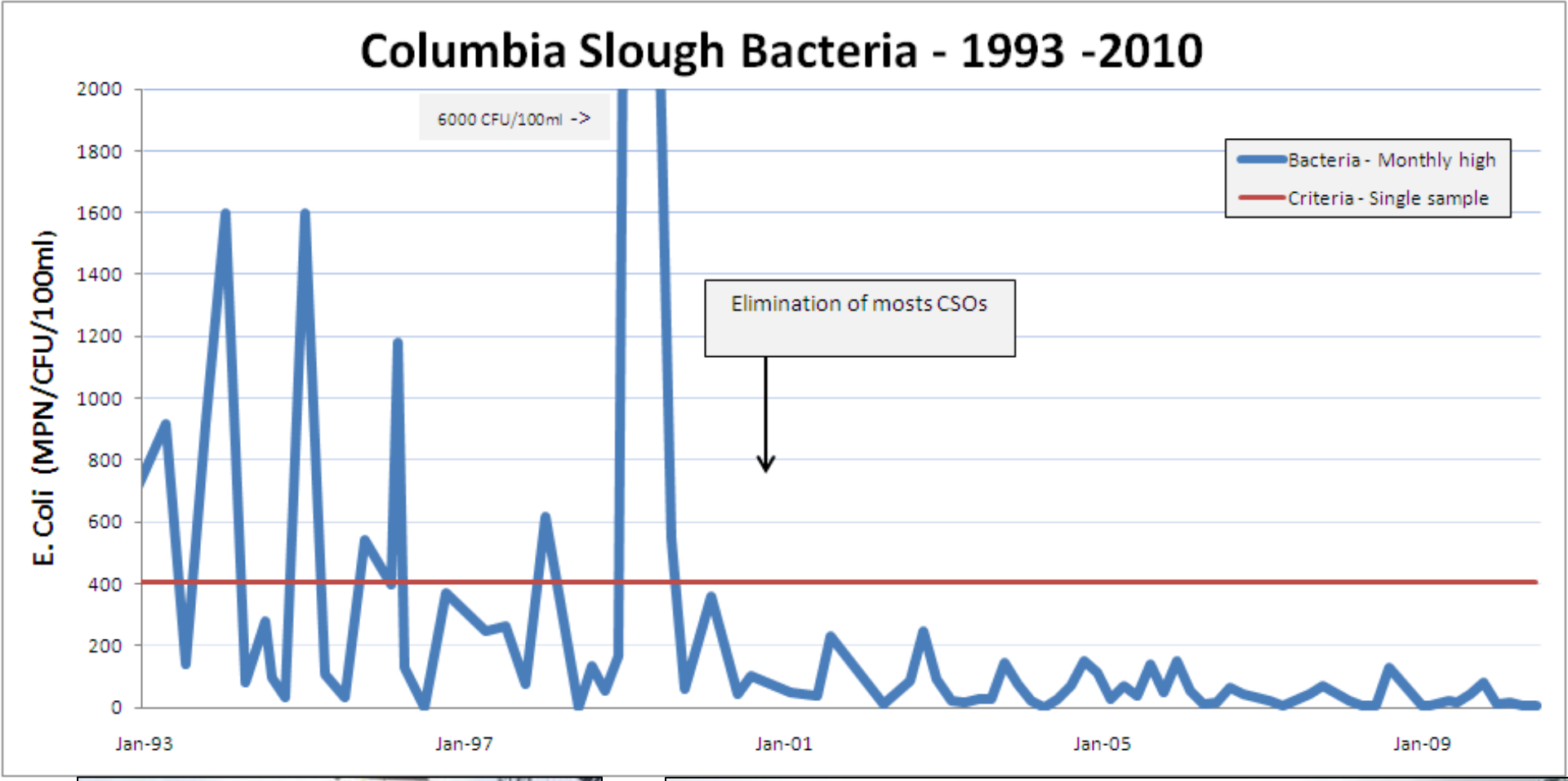
Oregon Water Quality Index Results (WY 2001-2010)



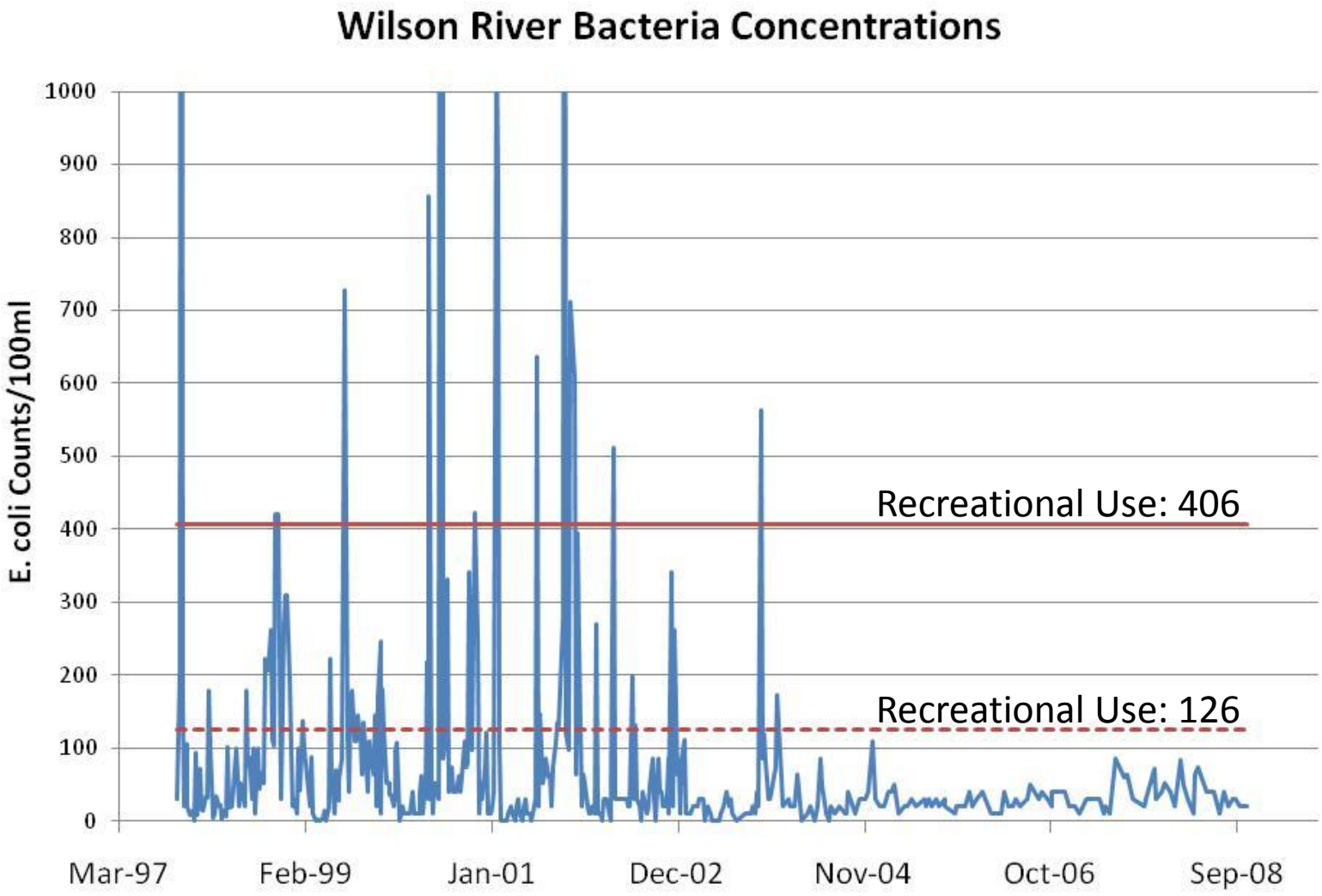

1990 – 27% Good

2010 – 47% Good

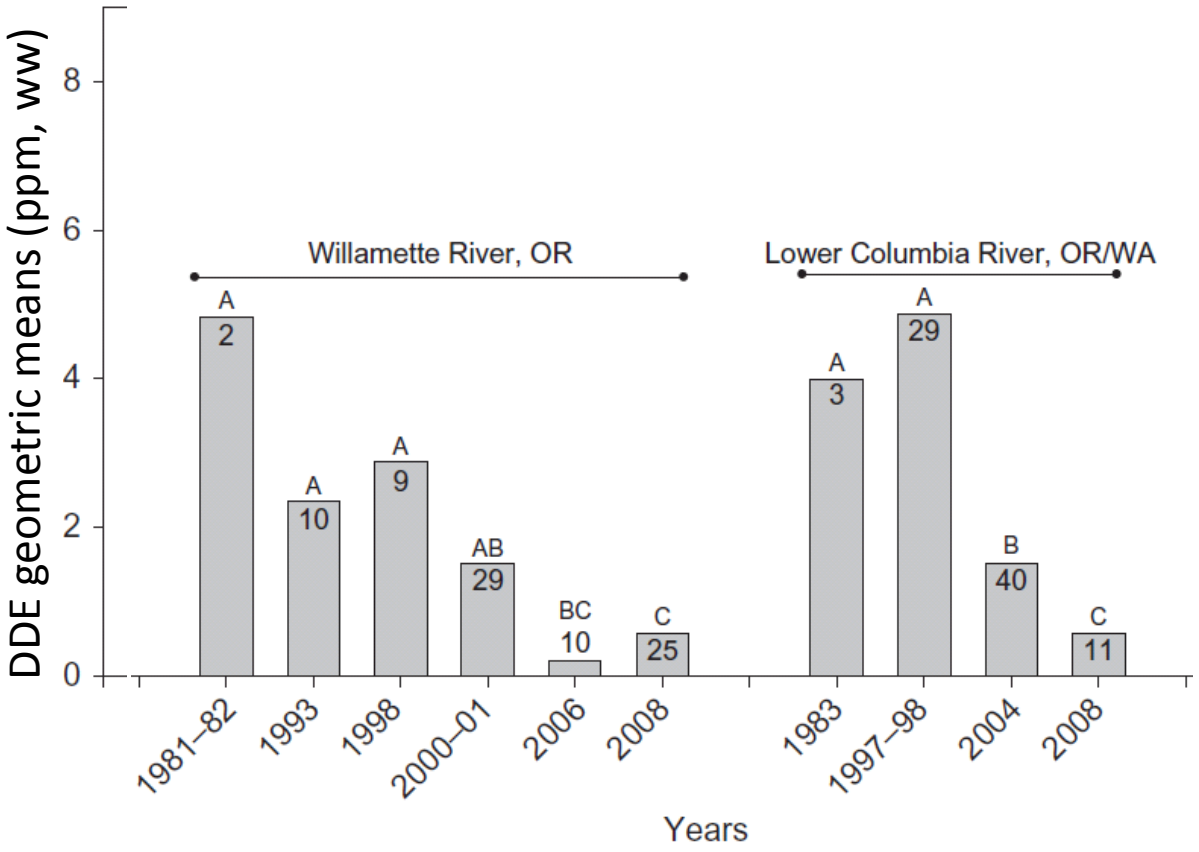
# Columbia Slough Bacteria - 1993 -2010




# Trends and Sources of Bacteria

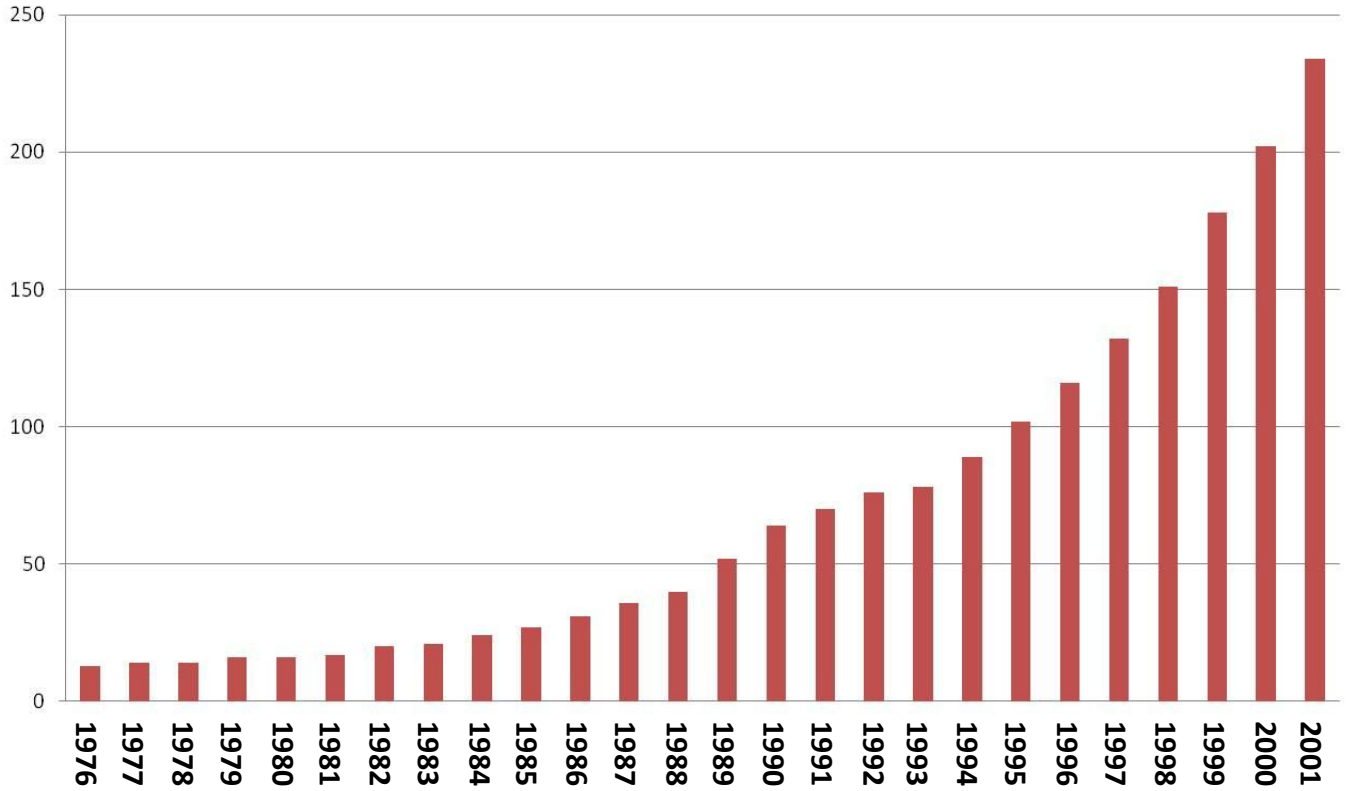


**DDE concentrations in osprey eggs from the Willamette (1981 to 2008.**




Geometric mean DDE concentrations (ppm, ww) in osprey eggs from the Willamette (OR) and Columbia Rivers (OR/WA) 1981 to 2008.
(Henny, et. al. 2010)

## Number of Osprey Nests on the Willamette River 1976 – 2001[a]



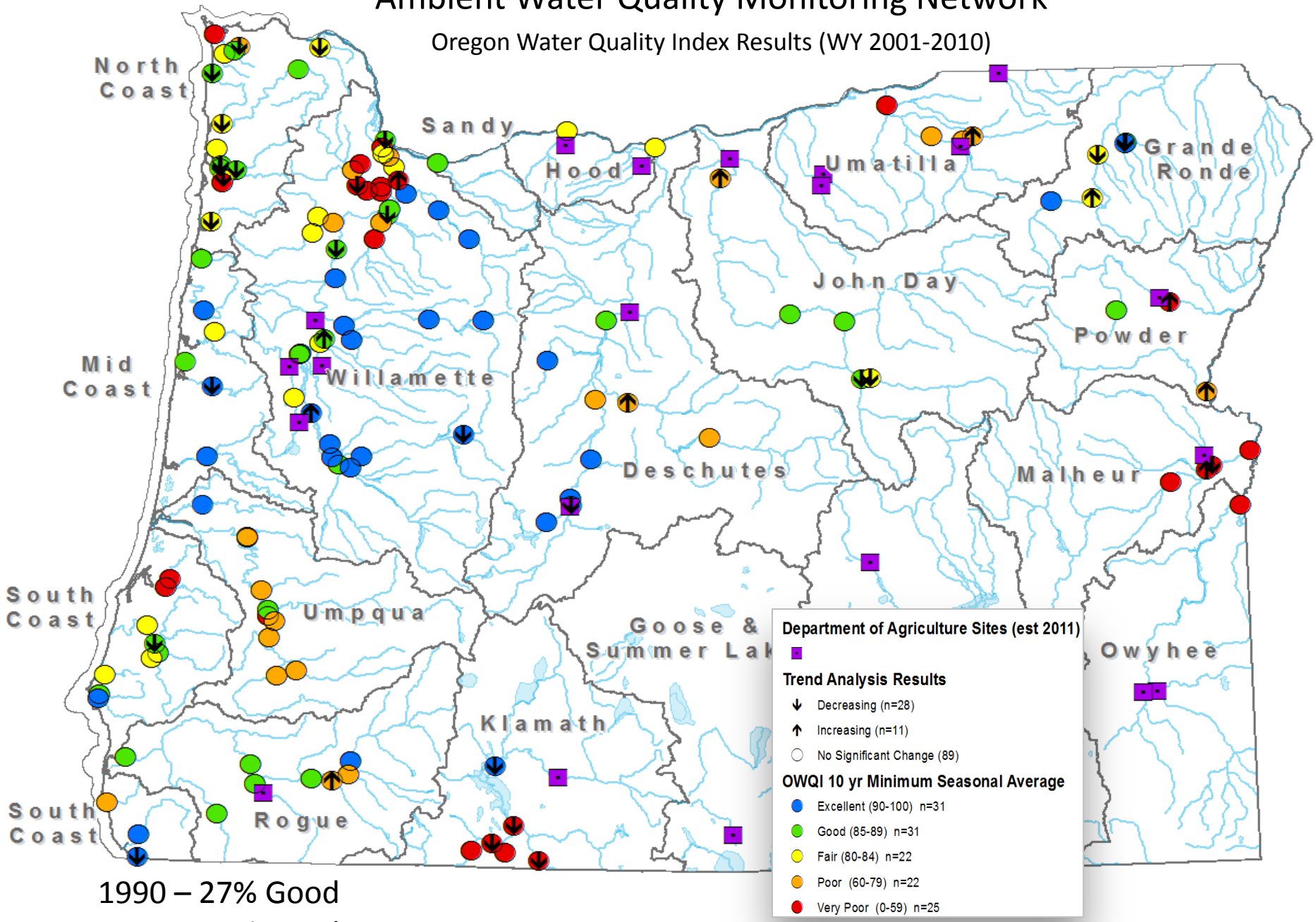

[a]**Henny, USGS. Unpublished data** (http://yosemite.epa.gov/r10/ecocomm.nsf/Columbia/)

# *Caveats and Challenges*

- Growth
- Land use changes
- Backsliding
- New standards and unresolved problems
- New Threats (pharmaceuticals, flame retardants, personal care products, invasive species, green house gas emissions and other global issues)

# Ambient Water Quality Monitoring Network

Oregon Water Quality Index Results (WY 2001-2010)

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