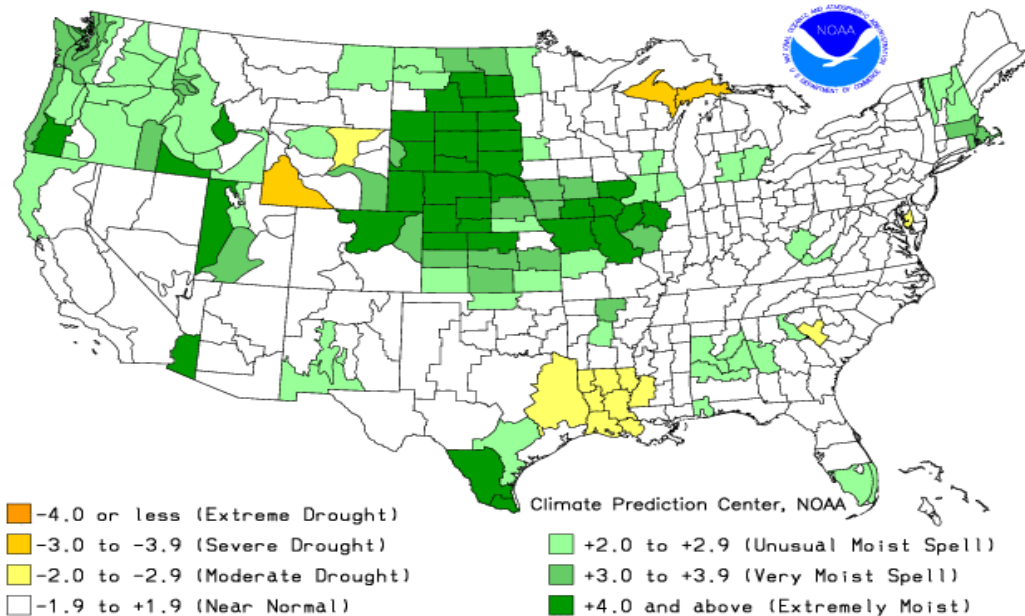


El Nino and Springtime Soil Moisture - An Analysis of the Past 20 years: Can we predict Soil Muddiness?

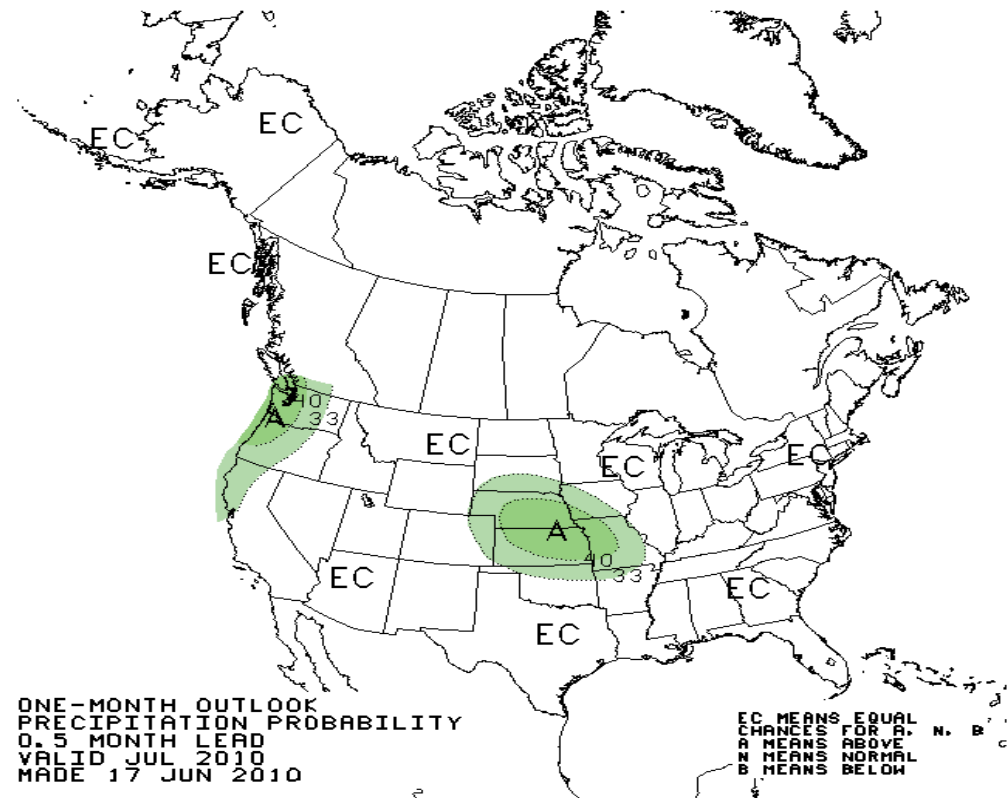
Willamette Valley Oregon
 Corvallis as an Example
 Leonard Coop, June 18, 2010

Palmer Drought Index – includes
 Moister than normal (not a simple
 calculation)

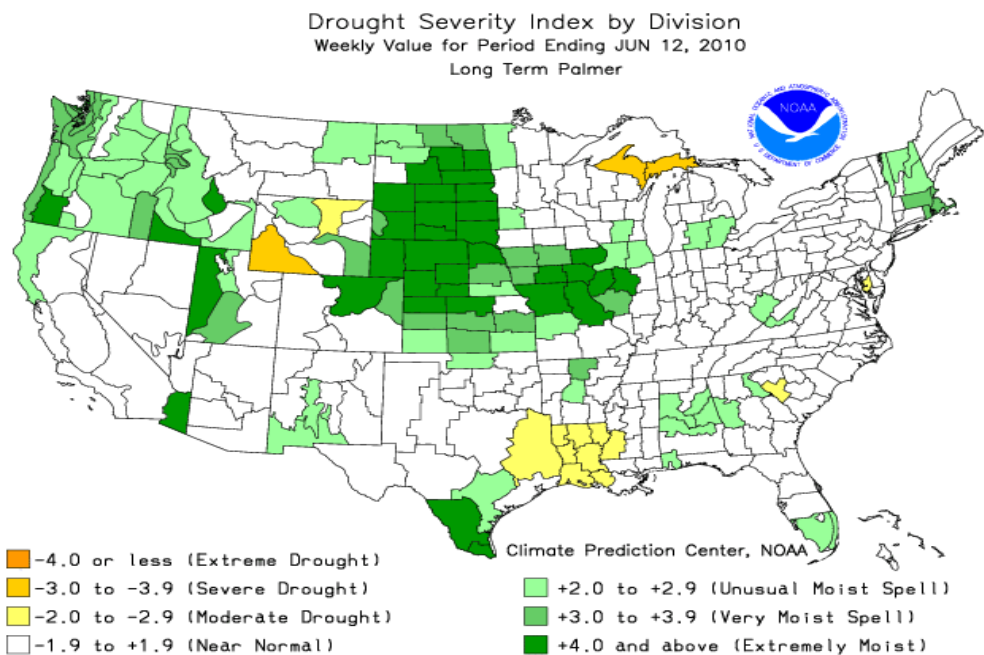
Drought Severity Index by Division
 Weekly Value for Period Ending JUN 12, 2010
 Long Term Palmer



NOAA precipitation forecast –
 continued wetter than Normal
 in W. Oregon

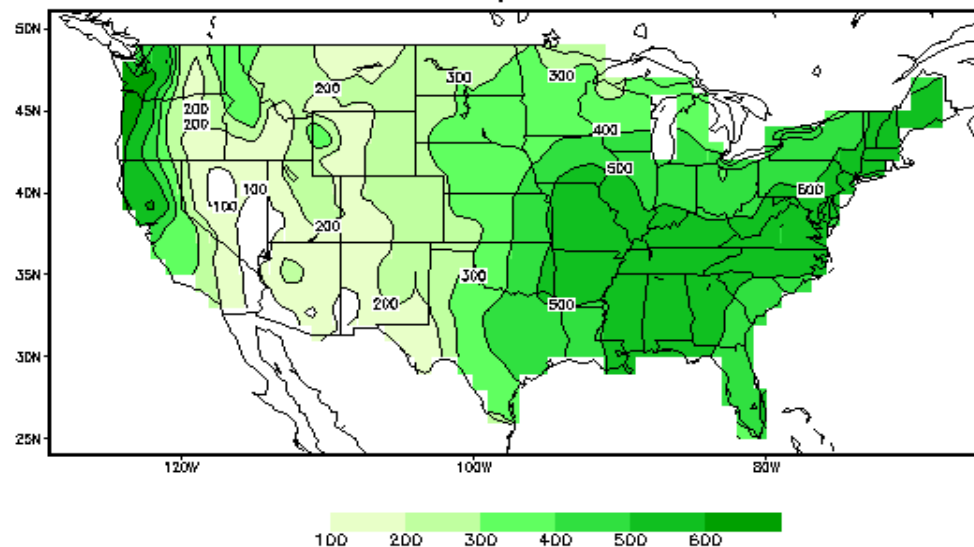


Spring 2010 – Soil Moisture very much higher than normal



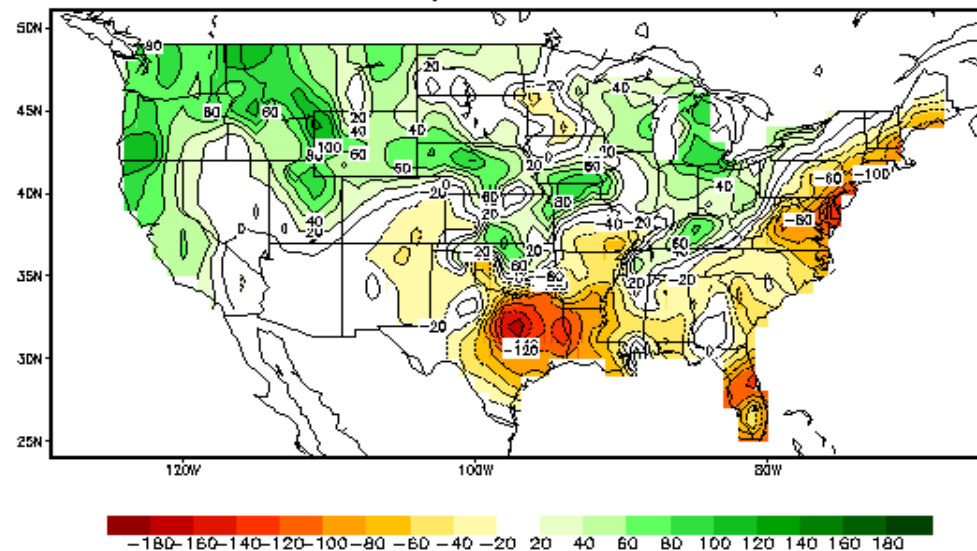
Weekly Time Scale

Calculated Soil Moisture (mm)
MAY, 2010



Monthly Time Scale

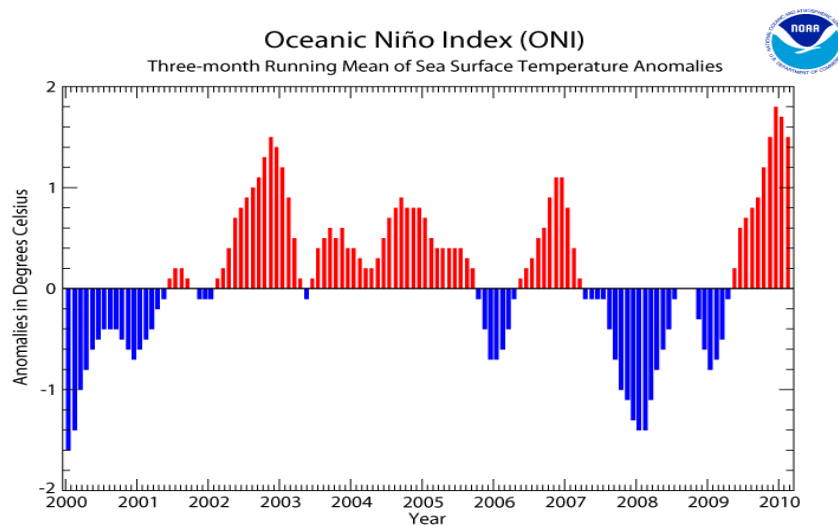
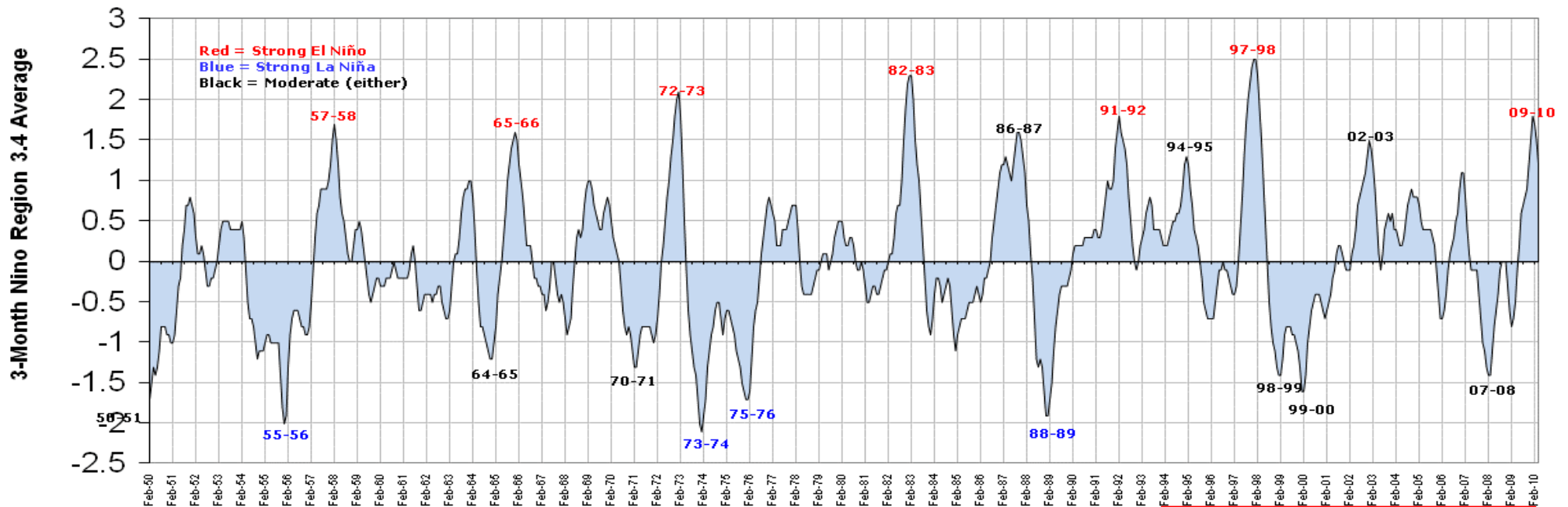
Calculated Soil Moisture Anomaly Change
JUN 17, 2010 from MAR.31



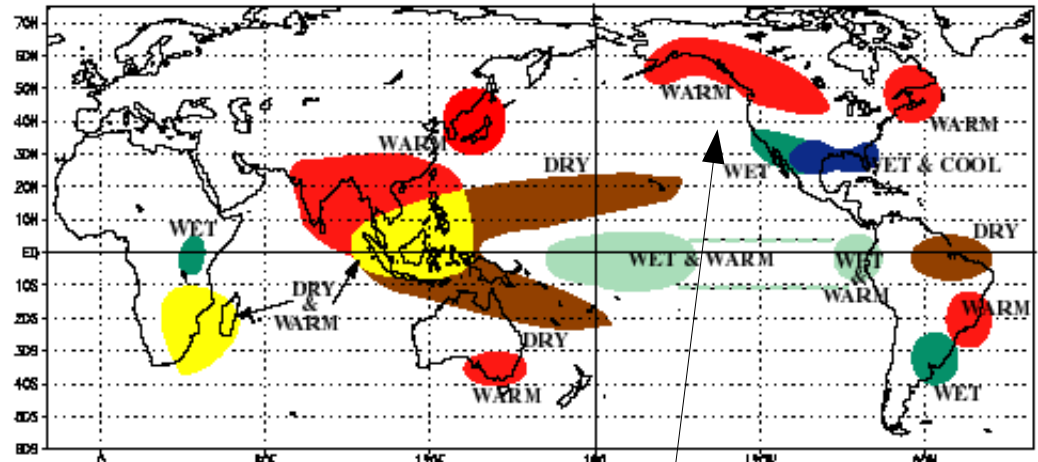
Seasonal Time Scale

Oceanic Niño Index (ONI)

http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ens



WARM EPISODE RELATIONSHIPS DECEMBER - FEBRUARY

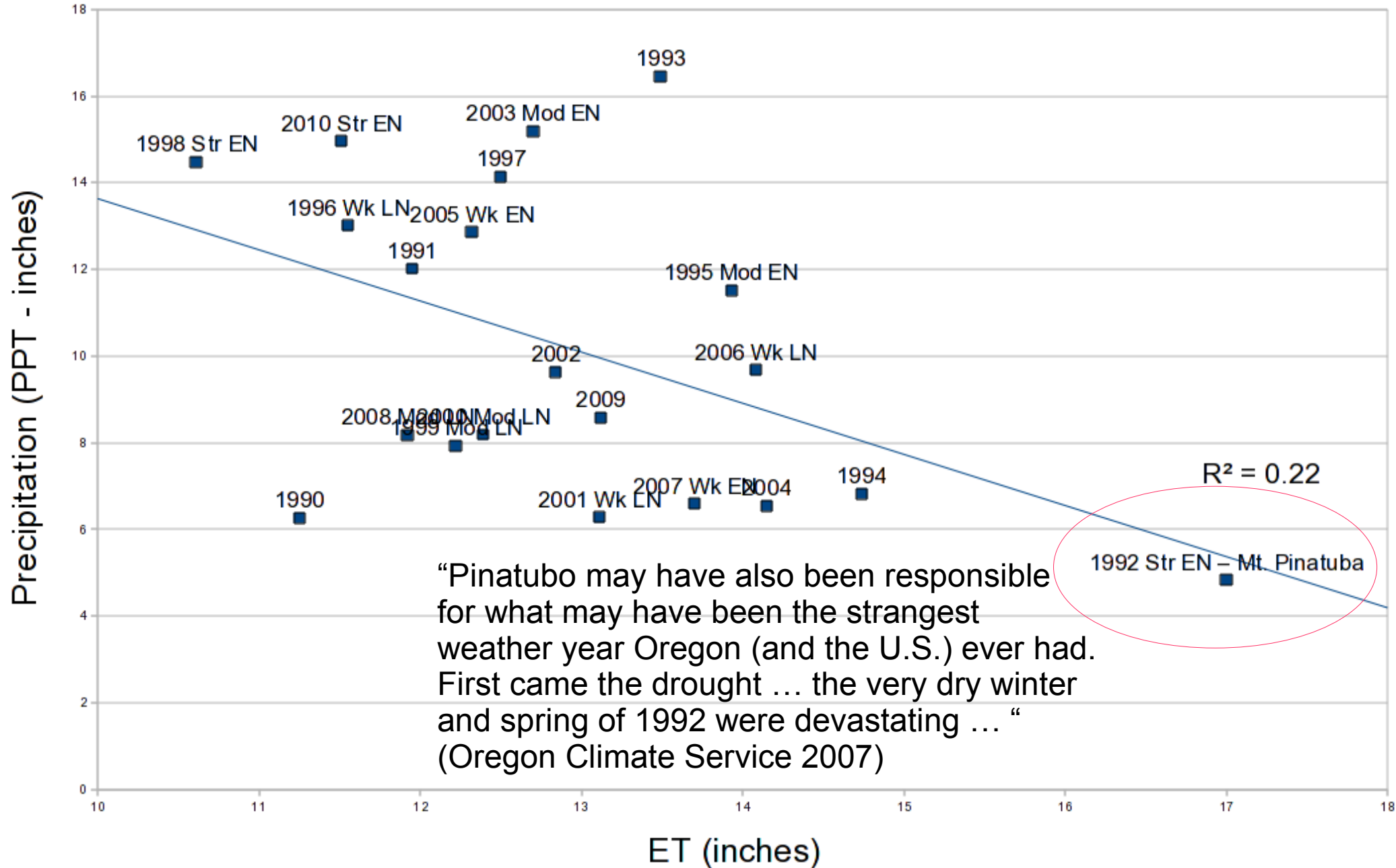


El Niño Effects have not been as well characterized for Spring as Winter (winters are associated with warm winters in PNW; but can we say for Spring weather?)

Simple Soil Moisture Index: Precipitation (PPT) – Evapotranspiration (ET)

Agrimet has daily data archived for both PPT and ET

1990-2010 Mar to Jun 10, Corvallis, OR



NOAA – Oceanic Nino Index (ONI):

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
1988	0.7	0.5	0.1	-0.2	-0.7	-1.2	-1.3	-1.2	-1.3	-1.6	-1.9	-1.9
1989	-1.7	-1.5	-1.1	-0.8	-0.6	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.1
1990	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
1991	0.4	0.3	0.3	0.4	0.6	0.8	1.0	0.9	0.9	1.0	1.4	1.6
1992	1.8	1.6	1.5	1.4	1.2	0.8	0.5	0.2	0.0	-0.1	0.0	0.2
1993	0.3	0.4	0.6	0.7	0.8	0.7	0.4	0.4	0.4	0.4	0.3	0.2
1994	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.9	1.2	1.3
1995	1.2	0.9	0.7	0.4	0.3	0.2	0.0	-0.2	-0.5	-0.6	-0.7	-0.7
1996	-0.7	-0.7	-0.5	-0.3	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.3	-0.4
1997	-0.4	-0.3	0.0	0.4	0.8	1.3	1.7	2.0	2.2	2.4	2.5	2.5
1998	2.3	1.9	1.5	1.0	0.5	0.0	-0.5	-0.8	-1.0	-1.1	-1.3	-1.4
1999	-1.4	-1.2	-0.9	-0.8	-0.8	-0.8	-0.9	-0.9	-1.0	-1.1	-1.3	-1.6
2000	-1.6	-1.4	-1.0	-0.8	-0.6	-0.5	-0.4	-0.4	-0.4	-0.5	-0.6	-0.7
2001	-0.6	-0.5	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.1	0.0	-0.1	-0.1
2002	-0.1	0.1	0.2	0.4	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.4
2003	1.2	0.9	0.5	0.1	-0.1	0.1	0.4	0.5	0.6	0.5	0.6	0.4
2004	0.4	0.3	0.2	0.2	0.3	0.5	0.7	0.8	0.9	0.8	0.8	0.8
2005	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	-0.1	-0.4	-0.7
2006	-0.7	-0.6	-0.4	-0.1	0.1	0.2	0.3	0.5	0.6	0.9	1.1	1.1
2007	0.8	0.4	0.1	-0.1	-0.1	-0.1	-0.1	-0.4	-0.7	-1.0	-1.1	-1.3
2008	-1.4	-1.4	-1.1	-0.8	-0.6	-0.4	-0.1	0.0	0.0	0.0	-0.3	-0.6
2009	-0.8	-0.7	-0.5	-0.1	0.2	0.6	0.7	0.8	0.9	1.2	1.5	1.8
2010	1.7	1.5	1.2	0.8								

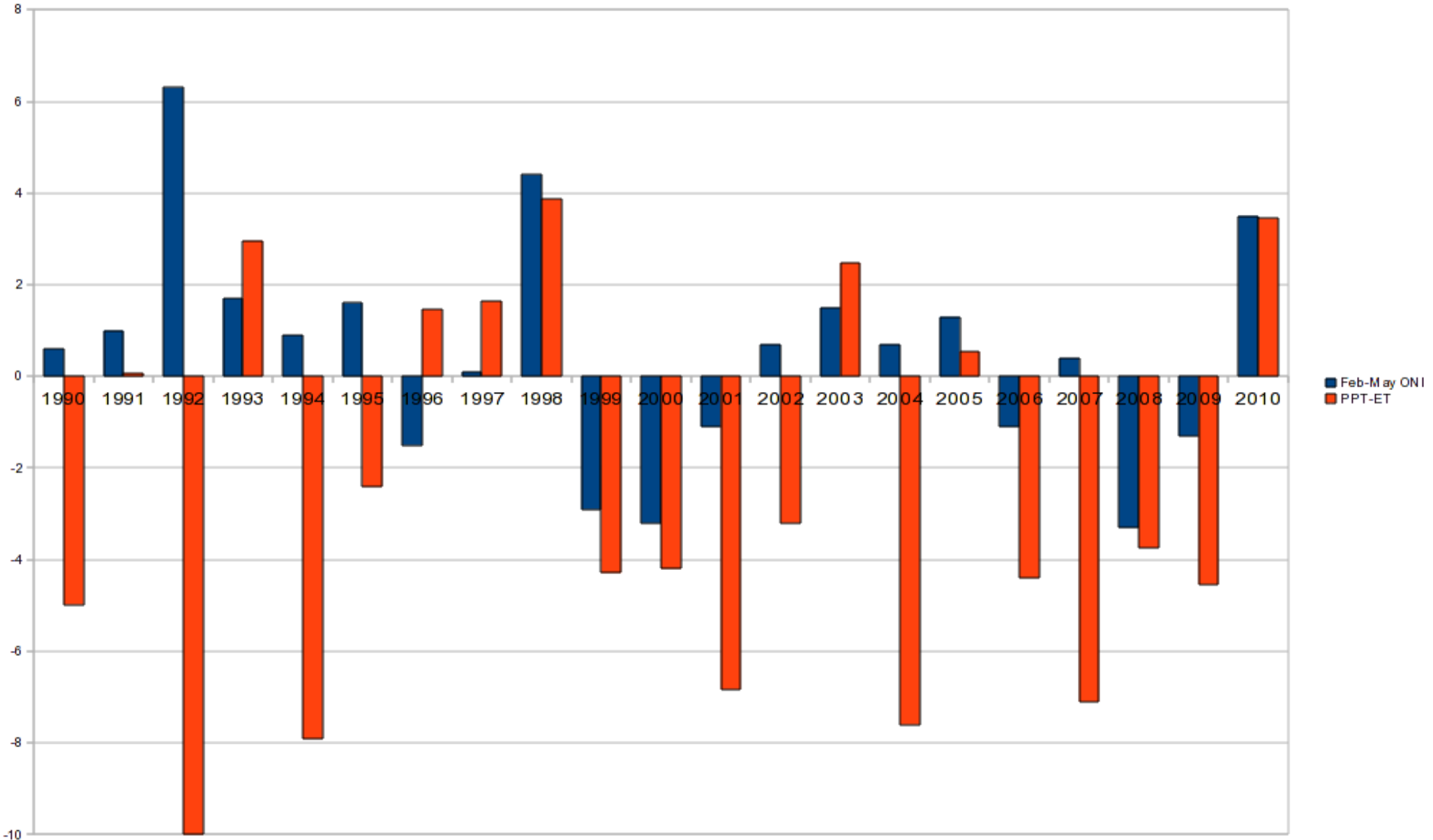
http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml

Simple Soil Moisture Index: Precipitation (PPT) – Evapotranspiration (ET)

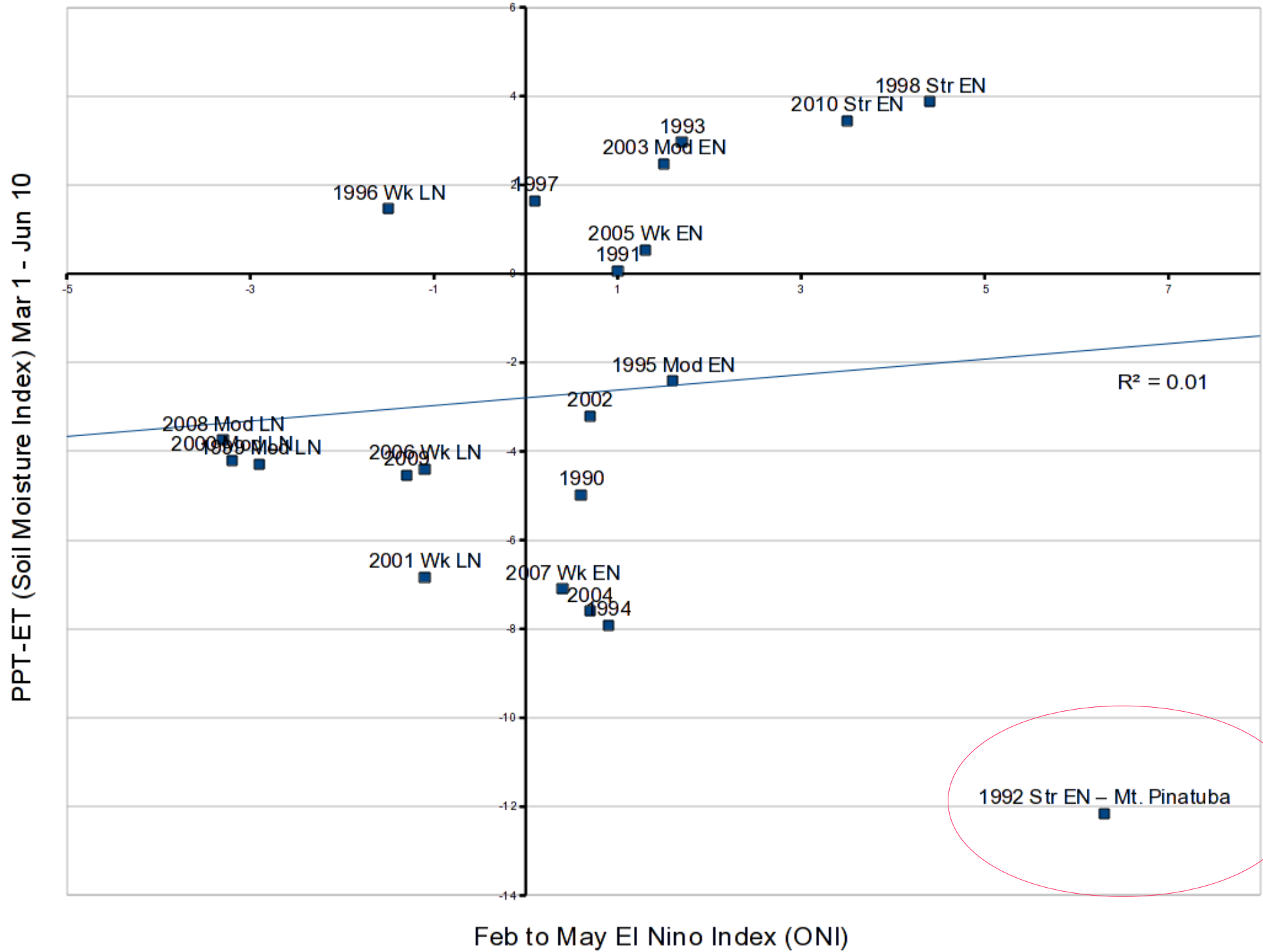
Agrimet has daily data archived for both PPT and ET

Soil Moisture Index and El Nino since 1990

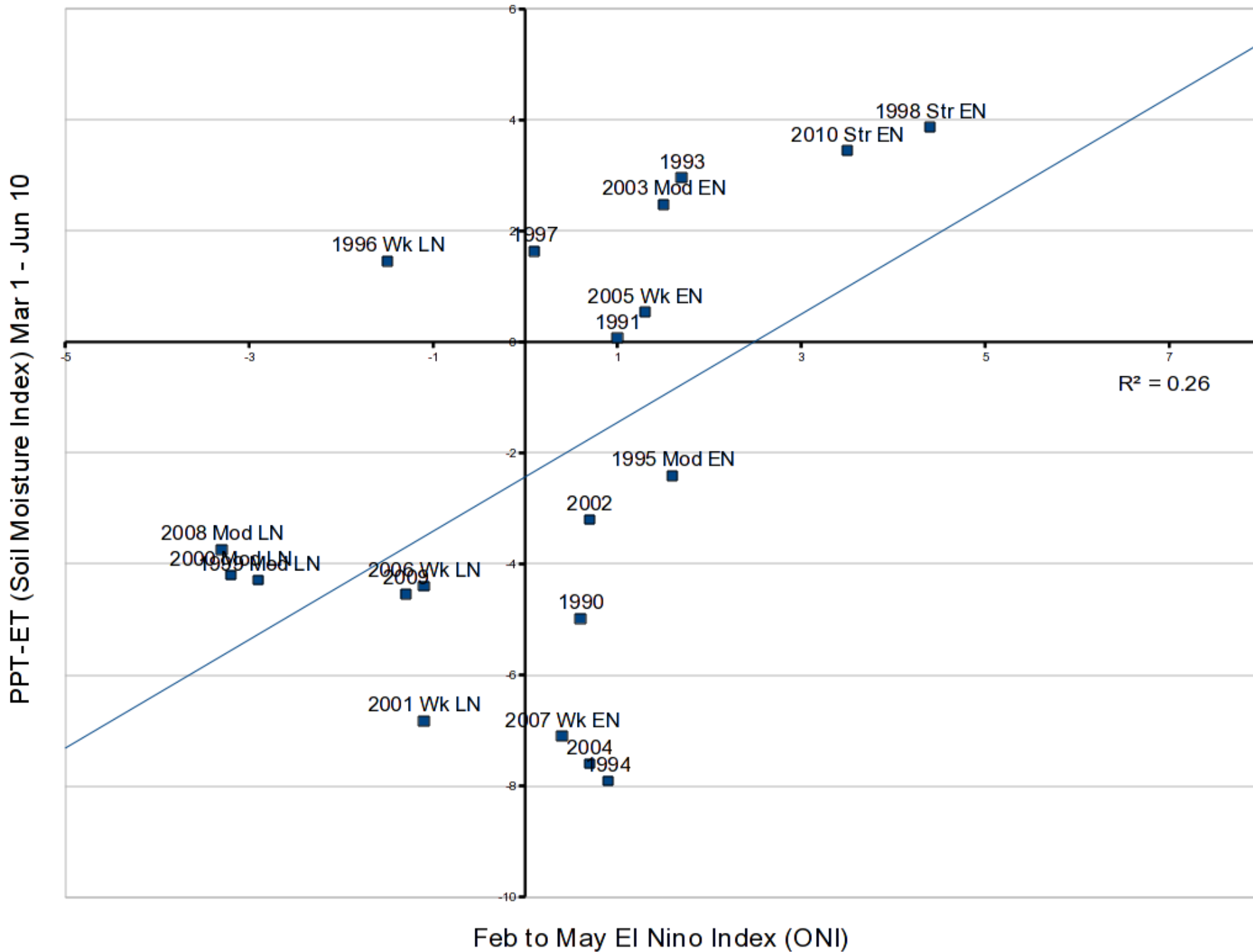
Corvallis, Oregon



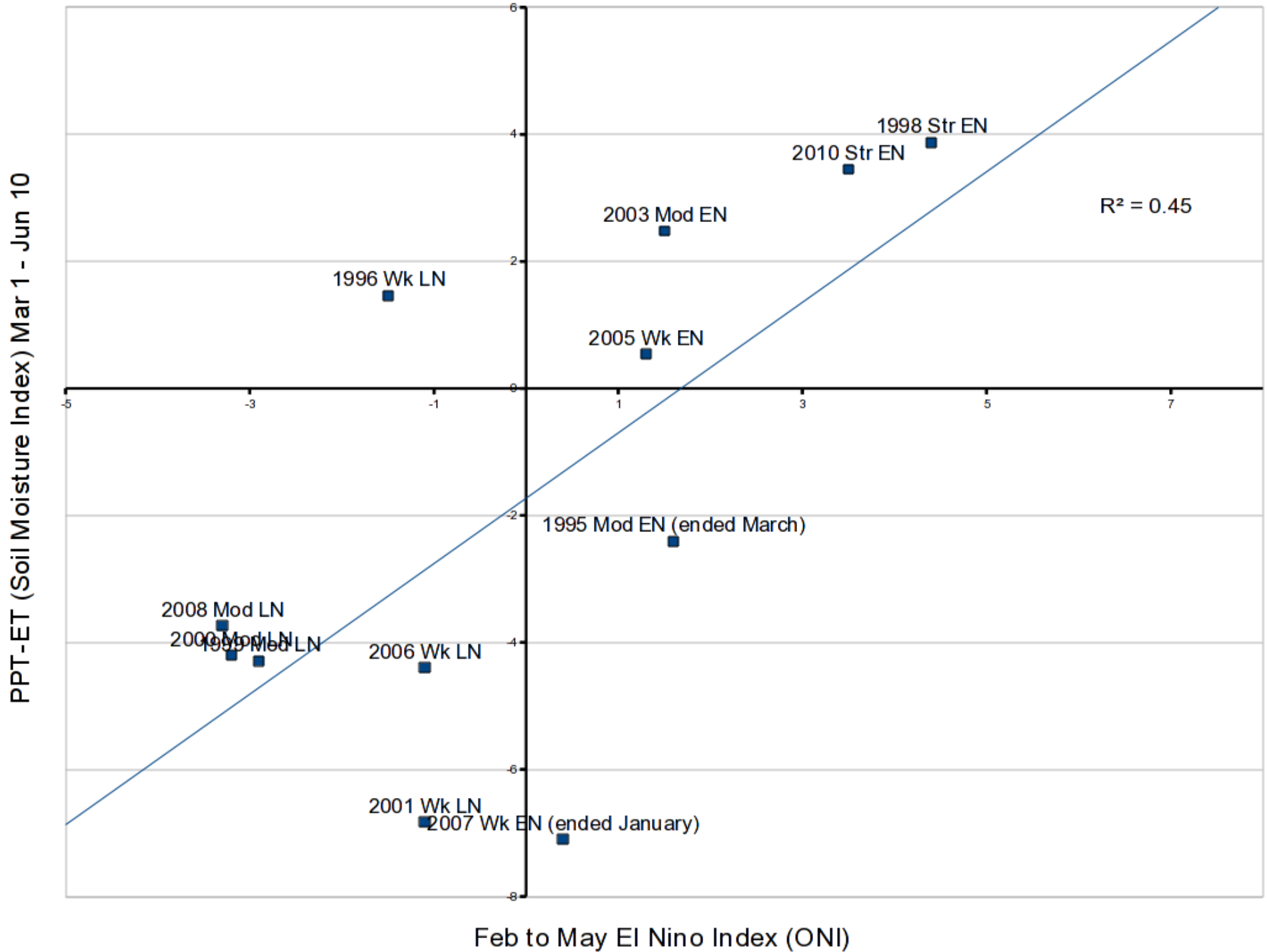
El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
 1992 El Nino Included



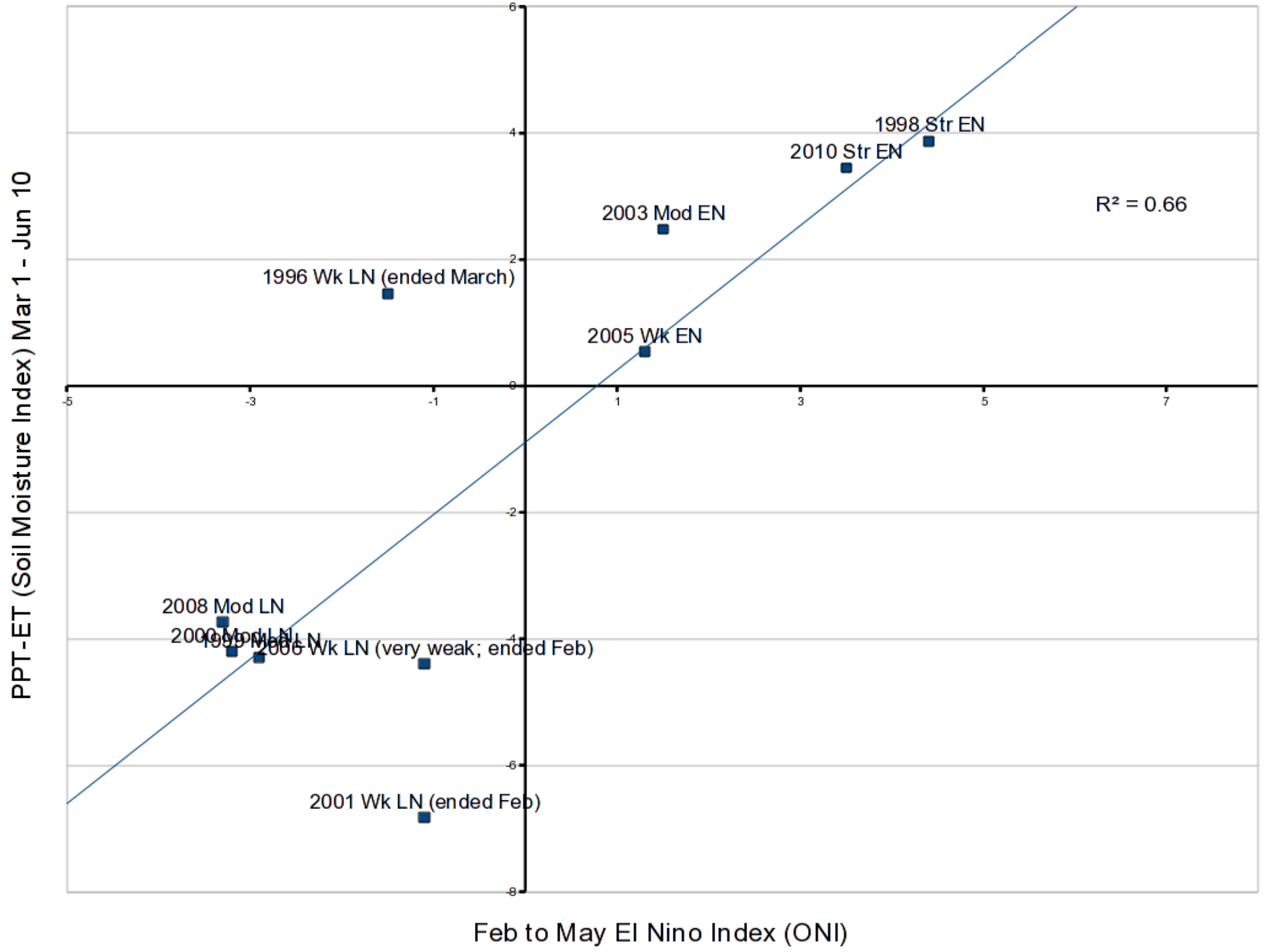
El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
1992 El Nino Excluded - Mt. Pinatuba effect?



El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
1992 El Nino & all non EN/LN years (noise)

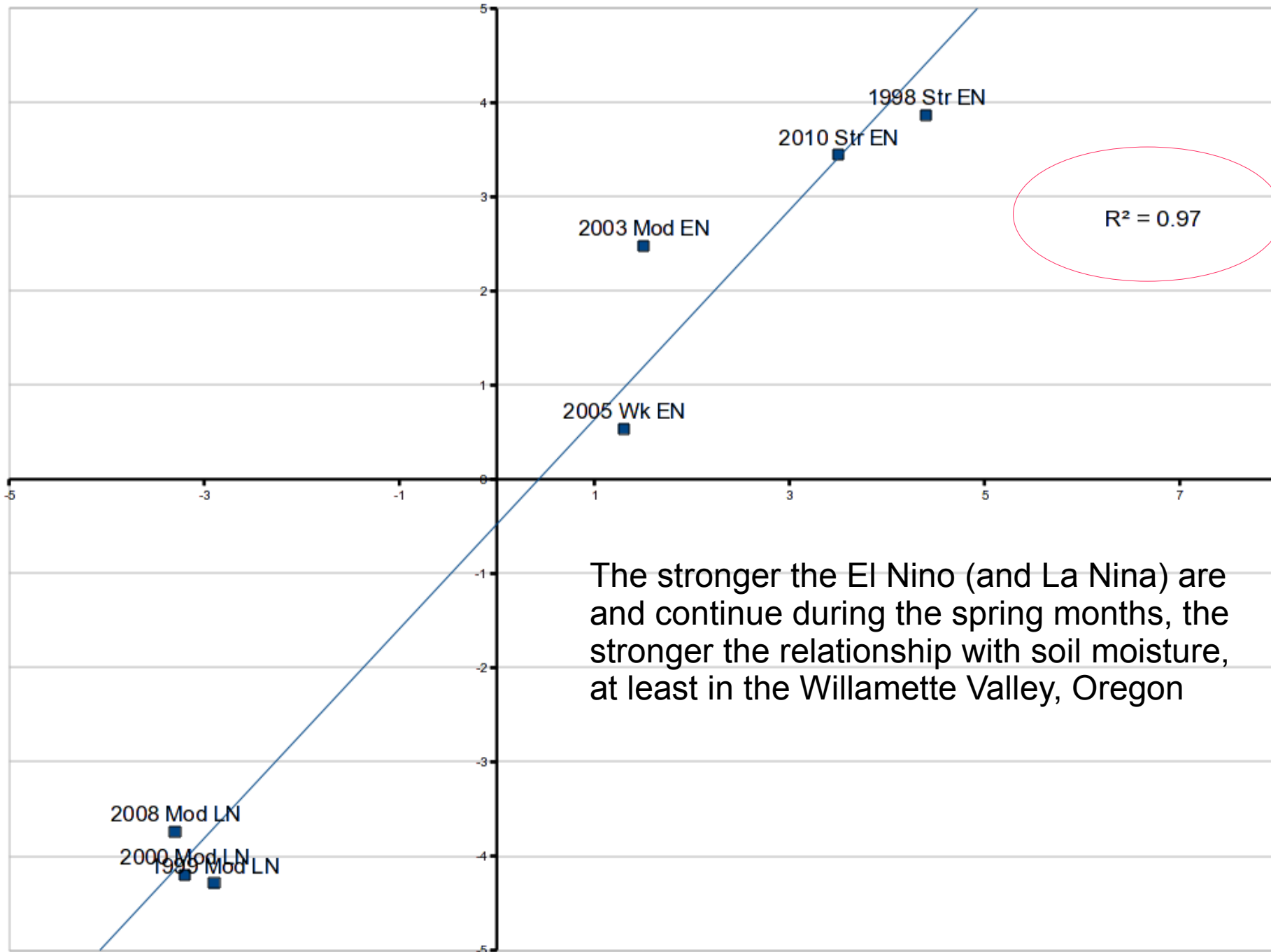


El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
1992 El Nino & all non EN/LN years (noise)



El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
1992 El Nino & all non EN/LN years (noise)

PPT-ET (Soil Moisture Index) Mar 1 - Jun 10



The stronger the El Nino (and La Nina) are and continue during the spring months, the stronger the relationship with soil moisture, at least in the Willamette Valley, Oregon

Feb to May El Nino Index (ONI)

El Nino - La Nina vs. Soil Moisture Index, Corvallis OR, 1990-2010
 1992 El Nino & all non, early exit (weak) EN/LN years

