

THE PDO

Some have questioned the role of the sun and oceans in multi-decadal climate changes. You will hear them use La Ninas to explain away cool years and can't wait for the New Year's day to end when El Nino's develop to predict the year will be the warmist ever. They will never admit to the multidecadal cycles in the oceans as these might explain some or most of the warming they want you to believe are the result to your driving SUVs and the burning coal and oil. While Joe Bastardi and I readily admit man has an affect on our climate through factors like urbanization, land use changes, the addition of aerosols and maybe even gases, we believe natural factors can't be neglected. We use them in our forecasting. Let's look at one of these natural drivers, the PDO today.

The "Pacific Decadal Oscillation" (PDO) is a long-lived El Niño-like pattern of Pacific climate variability according to scientists at [JISAO](#) at the University of Washington..

“While the two climate oscillations have similar spatial climate fingerprints, they have very different behavior in time. Fisheries scientist Steven Hare coined the term "Pacific Decadal Oscillation" (PDO) in 1996 while researching connections between Alaska salmon production cycles and Pacific climate (his dissertation topic with advisor Robert Francis).

Two main characteristics distinguish PDO from El Niño/Southern Oscillation (ENSO): first, 20th century PDO "events" persisted for 20-to-30 years, while typical ENSO events persisted for 6 to 18 months; second, the climatic fingerprints of the PDO are most visible in the North Pacific/North American sector, while secondary signatures exist in the tropics - the opposite is true for ENSO.

Several independent studies find evidence for just two full PDO cycles in the past century: "cool" PDO regimes prevailed from 1890-1924 and again from 1947-1976, while "warm" PDO regimes dominated from 1925-1946 and from 1977 through (at least) the mid-1990's. Shoshiro Minobe has shown that 20th century PDO fluctuations were most energetic in two general periodicities, one from 15-to-25 years, and the other from 50-to-70 years.”

The [PDO index](#) is derived as the leading PC of monthly SST anomalies in the North Pacific Ocean. It was found while researchers at the University of Washington were trying to find reasons why salmon fisheries exhibited a distinct multidecadal behavior.

The landmark paper can be found: *Mantua, N.J. and S.R. Hare, Y. Zhang, J.M. Wallace, and R.C. Francis, 1997: A Pacific interdecadal climate oscillation with impacts on salmon production. Bulletin of the American Meteorological Society, 78, pp 1069-1079.*

Their abstract:

“Evidence gleaned from the instrumental record of climate data identifies a robust, recurring pattern of ocean-atmosphere climate variability centered over the mid-latitude Pacific basin. Over the past century, the amplitude of this climate pattern has varied

irregularly at interannual-to-interdecadal time scales. There is evidence of reversals in the prevailing polarity of the oscillation occurring around 1925, 1947, and 1977; the last two reversals correspond with dramatic shifts in salmon production regimes in the North Pacific Ocean. This climate pattern also affects coastal sea and continental surface air temperatures, as well as streamflow in major west coast river systems, from Alaska to California.”

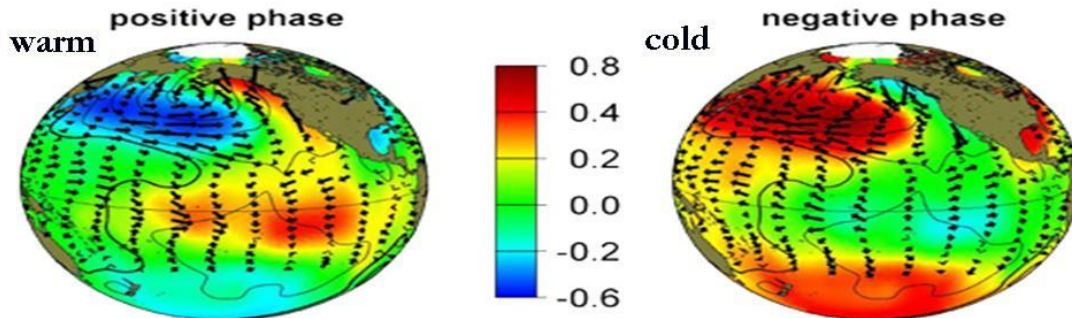
“The ENSO and PDO climate patterns are clearly related, both spatially and temporally, to the extent that the PDO may be viewed as ENSO-like interdecadal climate variability (Tanimoto et al. 1993; ZWB). While it may be tempting to interpret interdecadal climatic shifts as responses to individual (tropical) ENSO events, it seems equally conceivable that the state of the interdecadal PDO constrains the envelope of interannual ENSO variability.”

The authors made no claim as to which (PDO or ENSO) was the chicken and which the egg.

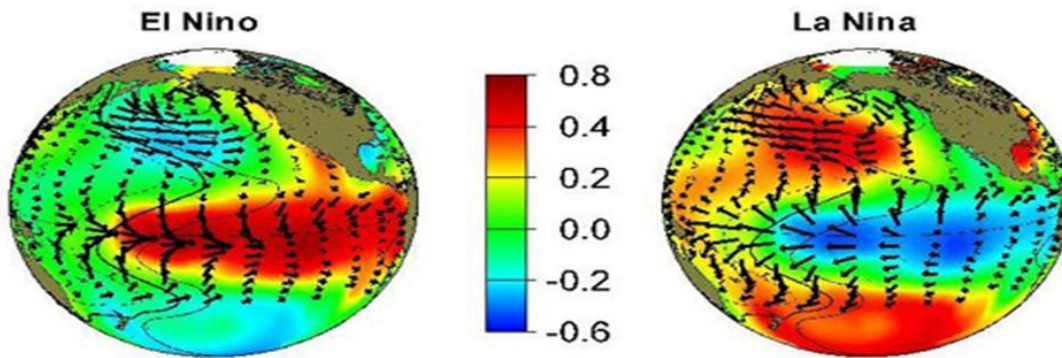
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Indeed you can see clearly they similarity of the ENSO and the PDO in ‘ocean temperature distribution’ in the two positive PDO Index and El Nino and negative PDO and La Nina.

Pacific Decadal Oscillation

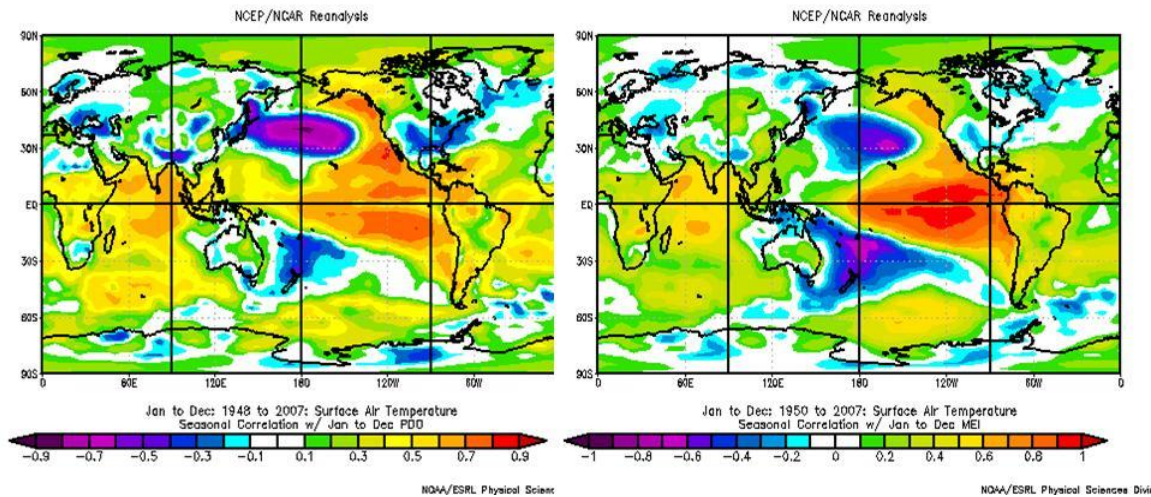


El Nino Southern Oscillation



The temperature correlations over land are almost identical.

Temperature Correlations

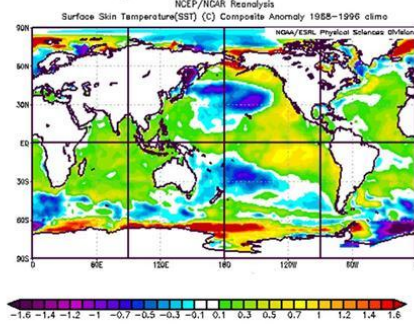


Pacific Decadal Oscillation

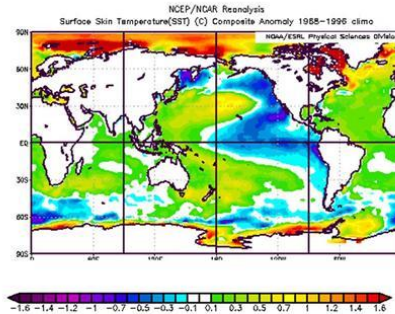
ENSO

You can see support for the paper's findings of the Great Pacific Climate Shift in 1977. You can support for the flip back in 1999 as Dr. Don Easterbrook found and published and posted on.

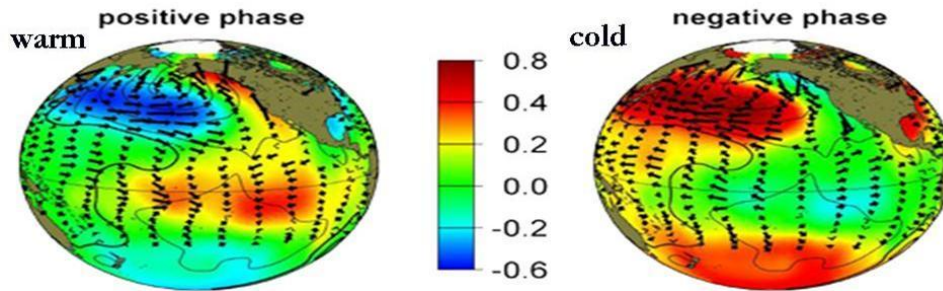
SSTA Change 1977-1986 from 1968-1977



SSTA Change 1999-2008 from 1989 to 1998

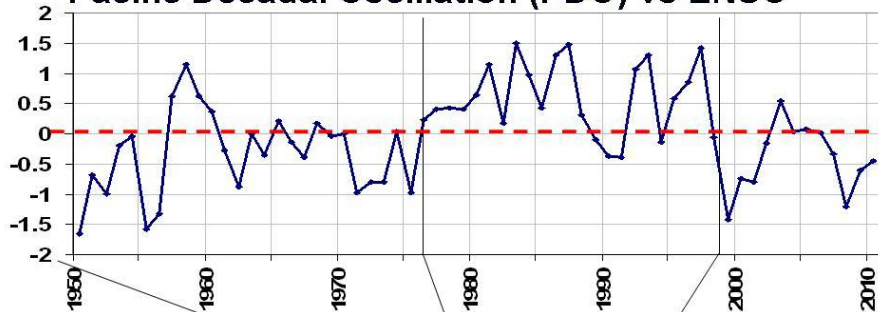


Pacific Decadal Oscillation



During the positive phase see the dominance of more frequent, stronger, longer La Ninas and the positive PDO mode, more frequent, stronger and longer El Ninos.

Pacific Decadal Oscillation (PDO) vs ENSO



<i>PDO</i>	Cold	Warm	Cold
Period	1947-1977	1978-1998	1999-2010
El Nino	7	10	3
La Nina	14	3	6

ENSO Duration in Months		
	El Nino	La Nina
Positive PDO	21	12
Negative PDO	13	20

The PDO is a very useful tool for forecasters. With other ‘teleconnections’ like the AMO, ENSO, QBO, IOD, WP, EPO, solar, we have a good basis for skillful seasonal prediction. There are more tools that help intraseasonally.

Modelers and warmists will never admit to the PDO existence or importance as it would provide an alternative reason for the warming during the period from 1977 to 1998. They have staked out the position that the warming entirely man-made, to keep their gravy train of funding going. They do the same for solar. Mann’s recent claim that man’s induced warming is 20 times more important than solar is laughable.