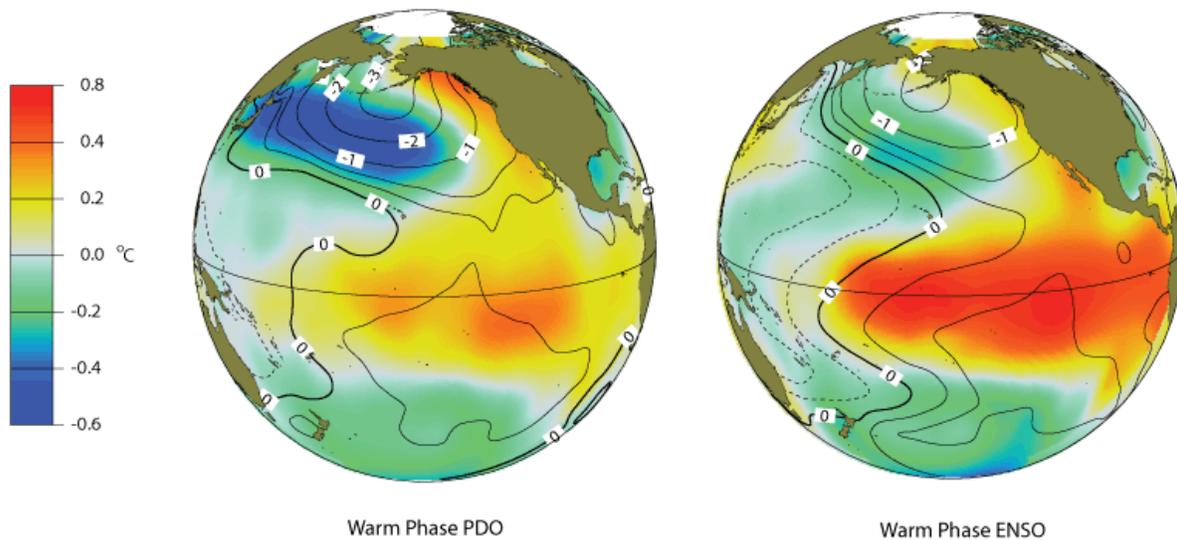


About PDO

The Pacific Decadal Oscillation

The Pacific Decadal Oscillation (PDO) is the predominant source of inter-decadal climate variability in the Pacific Northwest (PNW). Identified in 1996 by CIG researcher Nate Mantua and others, the PDO (like El Niño/Southern Oscillation(ENSO)) is characterized by changes in sea surface temperature, sea level pressure, and wind patterns. The PDO is described as being in one of two phases: a warm phase and a cool phase. Alternately, the PDO can be described by its index value: warm (cool) phase conditions correspond to positive (negative) index values.



Source: Climate Impacts Group, University of Washington

Figure 1. Warm Phase PDO and ENSO. The spatial pattern of anomalies in sea surface temperature (shading, degrees Celsius) and sea level pressure (contours) associated with the warm phase of PDO for the period 1900-1992. Note that the main center of action for the PDO (left) is in the north Pacific, while the main center of action for ENSO is in the equatorial Pacific (right). Contour interval is 1 millibar, with additional contours drawn for +0.25 and 0.5 mb. Positive (negative) contours are dashed (solid).

Figure 1 shows the sea surface temperature (SST) anomalies that are associated with the warm phase of PDO. The spatial patterns are very similar: both favor anomalously warm sea surface temperatures near the equator and along the coast of North America, and anomalously cool sea

surface temperatures in the central North Pacific. The cool phases for PDO and ENSO, which are not shown, have the opposite patterns of SST anomalies: cool along the equator and the coast of North America and warm in the central north Pacific.

During the 20th century, each PDO phase typically lasted for 20-30 years (Figure 2). Studies indicate that the PDO was in a cool phase from approximately 1890 to 1925 and 1945 to 1977. Warm phase PDO regimes existed from 1925-1946 and from 1977 to (at least) 1998. Pacific climate changes in the late 1990's have, in many respects, suggested another reversal in the PDO (from "warm" to "cool" phase conditions and possibly back to "warm"). However, a lack of PDO understanding makes it impossible to determine true PDO reversals soon after they occur.

For information about current PDO conditions or to download data, see Nathan Mantua's monthly accounting of the current state of the PDO: <http://www.jisao.washington.edu/pdo/>

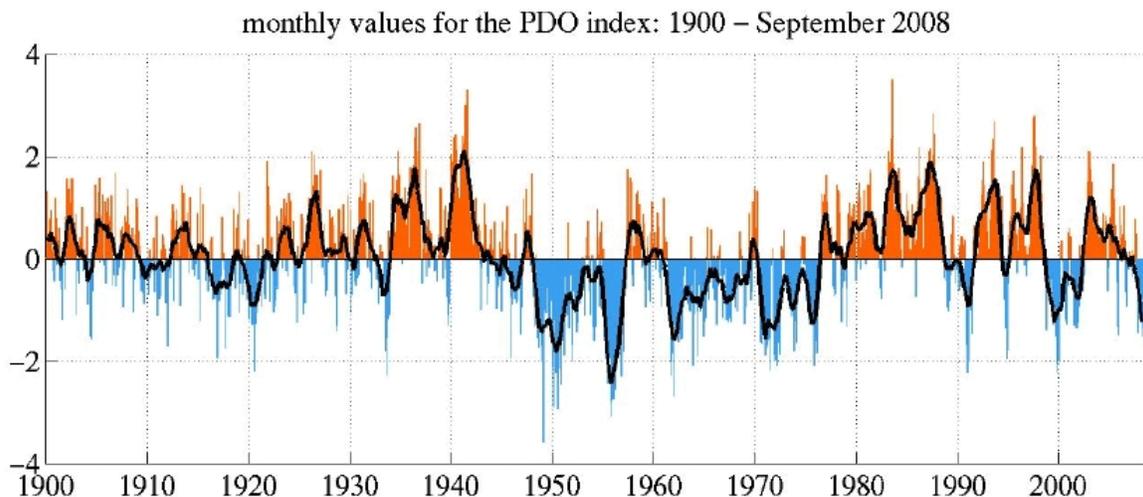


Figure 2. Monthly Values for the PDO Index, January 1900 to September 2008. Positive (red) index values indicate a warm phase PDO; negative (blue) index values indicate a cool phase PDO. While short-term flips in PDO phases do occur, evaluation of 20th century instrumental records has shown that PDO phases generally persist for 20-30 years, as indicated in this figure.

Adapted from <http://ces.washington.edu/cig/pnwc/aboutpdo.shtml>