Identifying anomalous climate conditions in the Northeastern Pacific Ocean

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2CICESE
3UABC
PROBLEM

Since 2012 we are testing a new climate index (unpublished). By following the sequence of the SLP monthly difference between Anchorage and San Diego, we perceive that something abnormal was happening because the SLP provides dramatic responses in the area of the Northeast Pacific.

Pending newsletters NOAA on the ENSO (2012-2013), in October 2012, caught our attention anomalous POSITIVE SLP in Anchorage, AL, was +15,860.

Then in March and April 2013 were also POSITIVE awaiting SLP anomalies with +12.29 and +12.33 respectively.

SLP anomalies between San Diego and Anchorage remained abnormally positive. November 2014 and February 2015 were the highest positive anomalies in recent months in Anchorage, with +10.5 and +12.7 respectively.

From these anomalous values, we started working modestly and with our own resources, to make this new climate index, that adequately describe the relationship for some regions influenced by the equatorward flow of the California Current.
SLP
SLP (mb) IN ANCHORAGE

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<td>999.32</td>
<td>1009.82</td>
<td>1008.12</td>
<td>1010.14</td>
<td>1014.22</td>
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<td>1004.74</td>
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</table>

Mean: 1002.40 1001.19 1003.92 1006.47 1007.89 1010.07 1007.53 1003.75 1000.02 1000.96 1000.36
Max: 1014.86 1028.80 1015.23 1016.25 1016.00 1014.90 1017.27 1014.90 1011.20 1013.88 1015.60 1014.56

6 records in 3 years..!!
4 records in 2013 since 1960
5 records in 3 years...!!
2 records in 2012, and 2 in 2013, since 1960
NEI
NorthEastern Index
NEI = SLP anom (E/SD) – SLP anom (Ancho)

Stand. Desv. of the difference between E/SD and Ancho

E/SD = ENSENADA/San Diego, CA
Ancho = Anchorage, AL

**Graph 1:**
- Monthly value
- 12-months moving average

**Graph 2:**
- NorthEastern (Pacific) Index
- April, 2015
- NEI

**Legend:**
- Color scale:
- Levels: 1/8, 1/4, 1/2, 1, 2, 4, 8, 16
NEI = \frac{\text{SLP anom (E/SD)} - \text{SLP anom(Ancho)}}{\text{Stand. Desv. of the difference between E/SD and Ancho (*)}}

(*) mean period (1960-1989)

E/SD = ENSENADA/San Diego, CA
Ancho = Anchorage, AL
\[
\text{NEI} = \frac{\text{SLP anom (E/SD)} - \text{SLP anom(Ancho)}}{\text{Stand. Desv. of the difference between E/SD and Ancho (*)}}
\]

(*) mean period (1960-1989)
E/SD = ENSENADA/San Diego, CA
Ancho = Anchorage, AL
surf. air temp. (°C)
### Air Temp. (°C) anomalies (surface) in ANCHORAGE

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<th>Jan</th>
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### Air Temp. (°C) anomalies (surface) in SAN DIEGO

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<th>Feb</th>
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<tr>
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<td>1.95</td>
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</tbody>
</table>

**Legend**
- **below 1 anom.**
- **cool**
- **warm**
- **above 1 anom.**
Surface Air Temperature anomalies (SONDJF mean) in Anchorage, AL.
Surface Air Temperature anomalies (SONDJF mean) in San Diego, CA
What do we currently know in this article?

A time series of a new climate index for atmospheric teleconnections between Anchorage and San Diego was generated.

The NEI signal indicates an intensification of high-pressure system near the Gulf of Alaska.

Ekman Transport (Ekty) trend is northward since 2010, not just at one point, but apparently all along the Pacific coast. This situation may have occurred before in the past, but the northward component had not stayed so long.

This may reflect the tendency of warm subtropical conditions over template and subpolar regions, as an increase in surface air temperature in Anchorage and SST since April 2013.
Thanks!
NorthEastern Index vs last two years SST