

# Surface Pressure

## ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



### ECV IN BRIEF

**Domain:** Atmosphere  
**Subdomain:** Surface  
**Scientific Area:** Physical Properties  
**ECV Stewards:** Philip Jones, Elizabeth Kent  
**Products:** Pressure

## Surface Pressure

Surface pressure is a fundamental meteorological variable controlling weather systems and providing information on the intensity of weather systems, including tropical cyclones. Pressure observations are required for the long-term simulations of past weather and climate known as "reanalyses". Patterns of large-scale pressure variation are used to construct circulation indices that are closely linked to known variations in global and regional climate.

### ECV Product<sup>1</sup>

| PRODUCT  | DEFINITION  | REQUIREMENTS |            |                                  |                |                       |
|----------|---|--------------|------------|----------------------------------|----------------|-----------------------|
|          |   | FREQUENCY    | RESOLUTION | REQUIRED MEASUREMENT UNCERTAINTY | STABILITY      | STANDARDS/ REFERENCES |
| Pressure | <b>Pressure at a known height above the surface with the height specified in the metadata</b> | Hourly       | Site       | 0.1hPa                           | 0.02hPa/decade | AOPC                  |

### Data Sources<sup>2</sup>

#### In Situ Data:

- ▶ Integrated Surface Database (ISD) of the National Centers for Environmental Information (NCEI) of the National Oceanic and Atmospheric Administration (NOAA)  
<https://www.ncdc.noaa.gov/isd/data-access>
- ▶ International Comprehensive Ocean-Atmosphere Data Set (ICOADS)  
<https://rda.ucar.edu/datasets/ds548.0/>

<sup>1</sup> Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: [gcos.wmo.int](https://gcos.wmo.int) and [climatedata.wmo.int](https://climatedata.wmo.int).

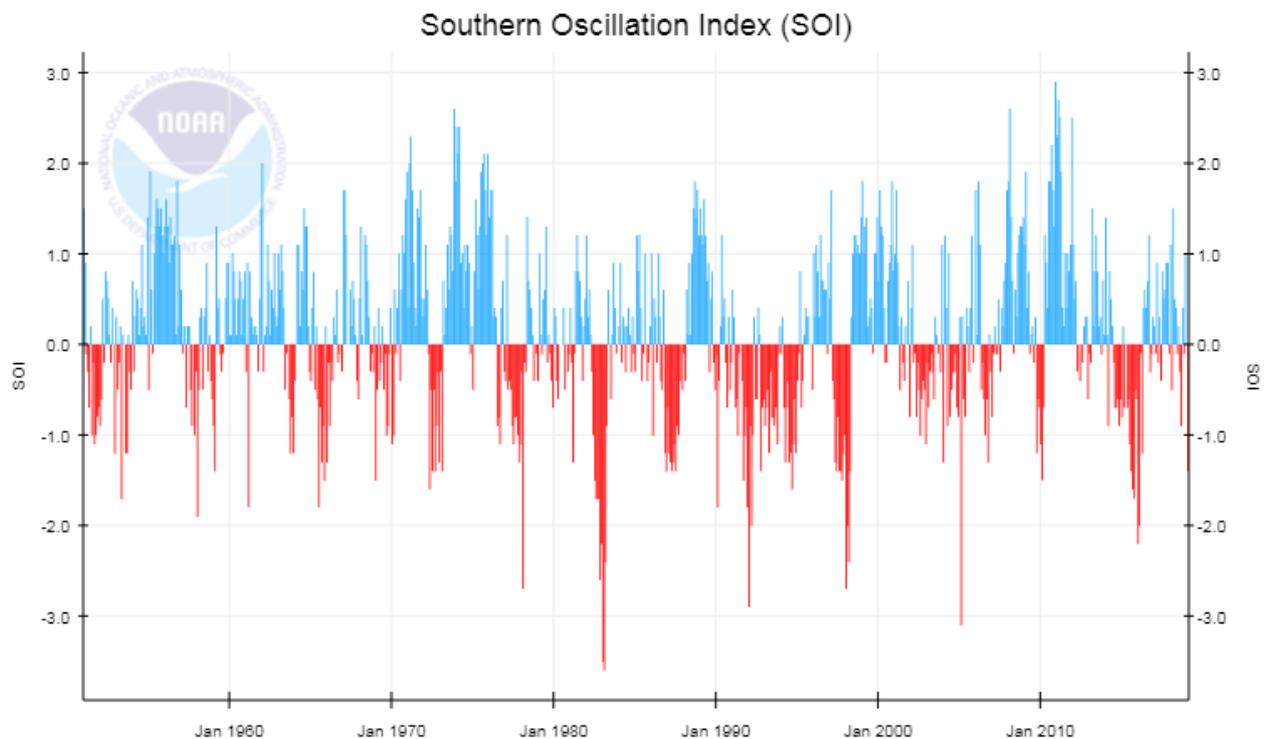
<sup>2</sup> This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s). The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.

## Reanalysis:

► REANALYSES.ORG (Inventory for Reanalysis)

<http://reanalyses.org>

## Southern Oscillation Index (SOI)



*Figure: The Southern Oscillation Index (SOI) is a standardized index based on the observed sea level pressure differences between Tahiti and Darwin, Australia. The SOI is one measure of the large-scale fluctuations in air pressure occurring between the western and eastern tropical Pacific (i.e., the state of the Southern Oscillation) during El Niño and La Niña episodes. In general, smoothed time series of the SOI correspond very well with changes in ocean temperatures across the eastern tropical Pacific. The negative phase of the SOI represents below-normal air pressure at Tahiti and above-normal air pressure at Darwin. Prolonged periods of negative (positive) SOI values coincide with abnormally warm (cold) ocean waters across the eastern tropical Pacific typical of El Niño (La Niña) episodes.*

Source: The index is calculated by National Oceanic and Atmospheric Administration's NOAA Climate Prediction Center (CPC) (<http://www.cpc.ncep.noaa.gov/data/indices/soi>).



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