



## Climate Trends at Indiana Dunes National Lakeshore

- We monitor weather and climate using existing weather stations in or near Network parks. Summaries presented here represent precipitation and temperature data collected by three weather stations near Indiana Dunes National Lakeshore.
- Data are collated on the website [www.ClimateAnalyzer.org](http://www.ClimateAnalyzer.org) and were summarized here through an agreement with the website's creator.

### 2012 Climate Summary

The manual weather station at Indiana Dunes National Lakeshore (INDU) recorded 30.5 inches of rainfall during 2012. The wettest month was July, with 6.2 inches of precipitation, and the driest was November, with 0.7 inches (Figure 1, top). January was the coolest month, with an average daily minimum temperature (Tmin) of 22 degrees Fahrenheit (°F), and July the hottest, with an average daily maximum temperature (Tmax) of 88 °F.

Typically, when a weather report states that a particular month was warmer or cooler than “average,” it is making a comparison to a set of averages calculated over a standard reference period. These averages are known as “climatological normals” and are updated every 10 years by the National Oceanic and Atmospheric Administration (NOAA). They are not simple averages or totals, but have instead been corrected for missing values and other irregularities.

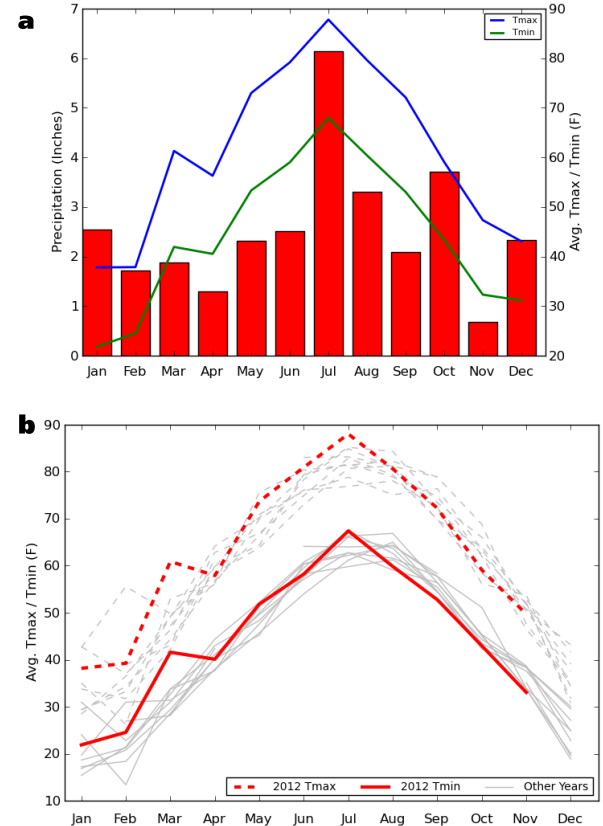
The INDU weather station has only been recording since 1989, so it does not yet have official climate normals. Despite this, examinations of data from INDU and other area stations all agree that it was generally warmer than past years from January through July of 2012 and again in December of 2012; it was cooler from August through November. This same pattern is seen in data from the automated weather station in Bailly, IN, which recorded temperatures very similar to INDU (compare Figure 1 top to Figure 1 bottom). Similarly, the La Porte, IN, station recorded a remarkable Tmax of 14.8 degrees above the 30-year averages (1981–2010) during March, while October and November had a Tmin about two degrees below average (Figure 2). Precipitation at La Porte during 2012 was 76% of the 30-year average (Figure 2).

### Longer-term Perspective on Precipitation

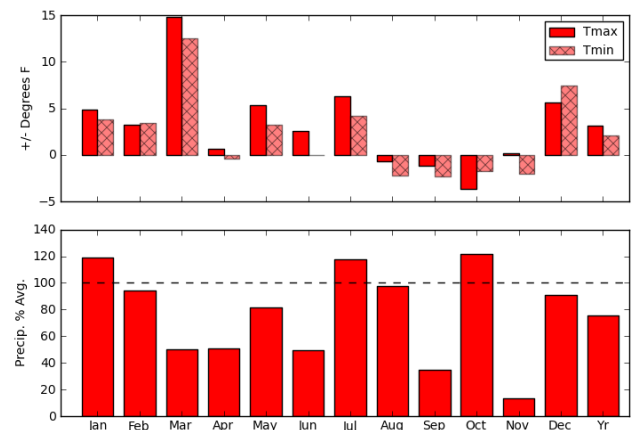
When expressed as a 5-year running average, total annual precipitation has generally been above the long-term average since 2008 at both the INDU and La Porte weather stations (blue-shaded areas in Figure 3). Despite this pattern, 2012 had below average precipitation (last value, Figure 3). Unlike total annual precipitation, November and June at both of these weather stations have had 5-year running average precipitation below the long-term since 2008 (not shown).

### Longer-term Perspective on Temperature

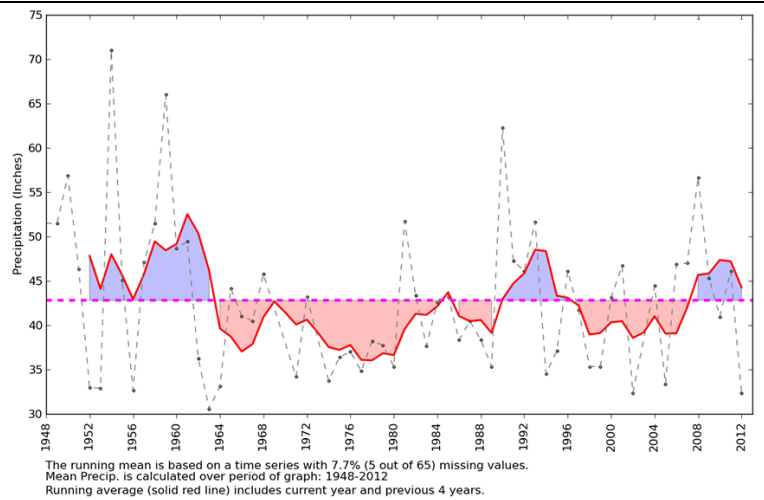
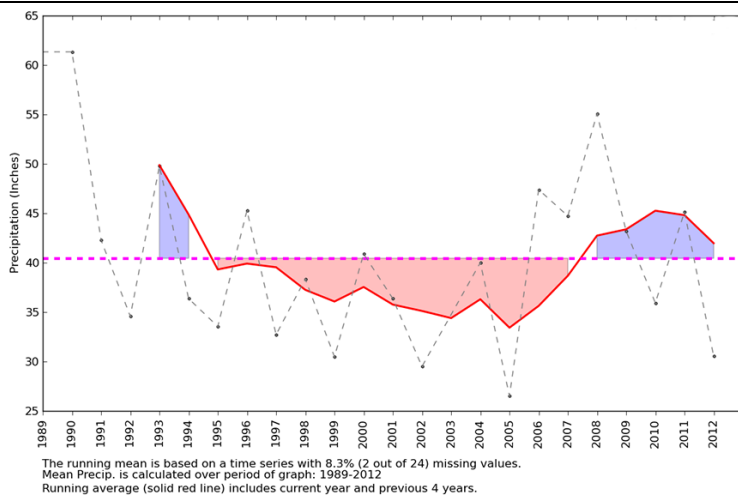
The data record at the INDU weather station is too short to draw a definite conclusion about long-term temperature trends (Figure 4, top). However, the La Porte weather station shows a long-term increase in Tmins. From 1948 to 2012, the 5-year running average Tmin increased from 38.8 to 42.2 °F (Figure 4, bottom). At the same time, the 5-year



**Figure 1. (a)** Monthly temperature and precipitation averages for the weather station INDU (COOP ID # 124244), 2012. Blue line is Tmax, green line is Tmin. **(b)** Monthly average Tmax (dashed lines) and Tmin (solid lines) for the automated weather station in Bailly, IN. Red = 2012, Gray = 2003–2011.

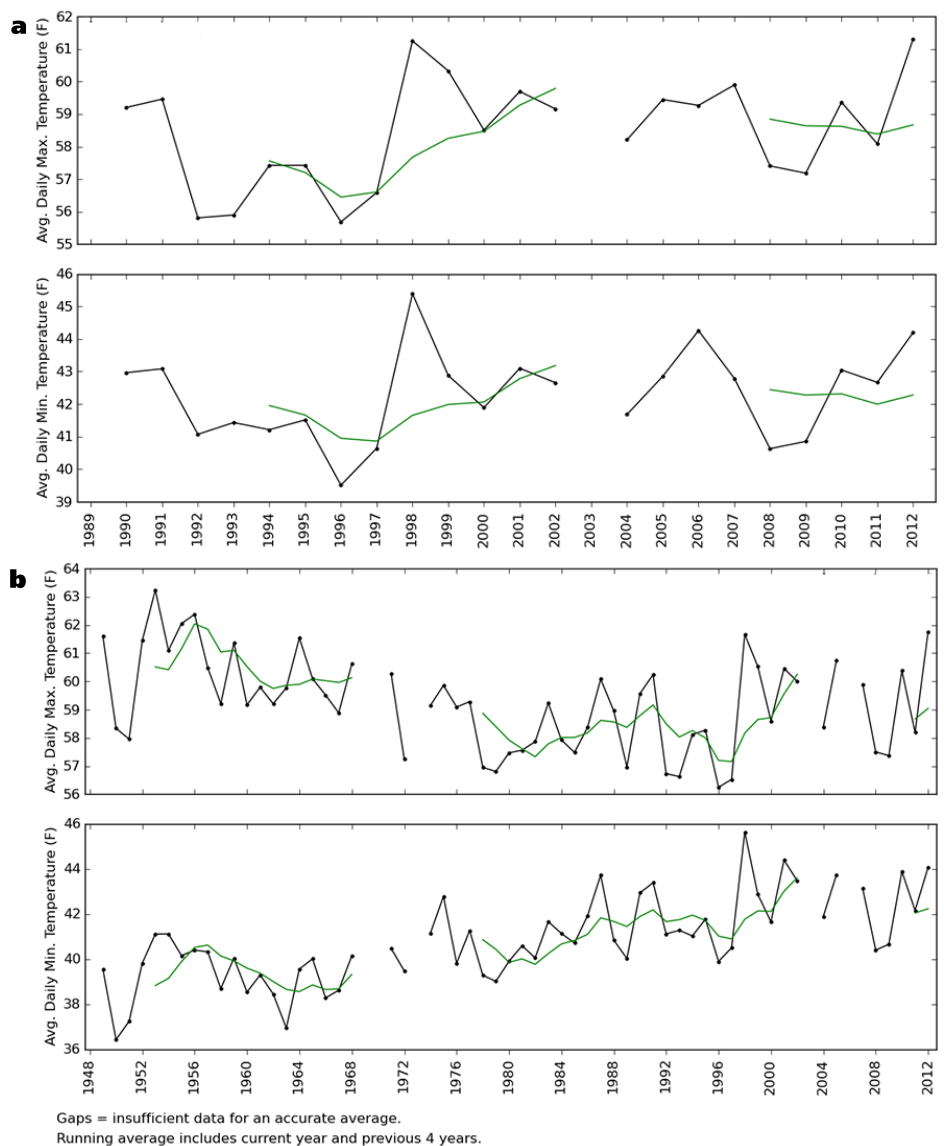


**Figure 2.** Monthly departures from the official 1981–2010 normals (averages) at the La Porte, Indiana weather station (COOP ID # 124837), 2012. Tmax = average daily maximum temperature. Tmin = average daily minimum temperature. La Porte is roughly 15 air miles inland from Indiana Dunes National Lakeshore.



**Figure 3.** Total annual precipitation at INDU, 1989–2012 (left), and at La Porte Indiana, 1948–2012 (right). Dashed red line indicates long-term average. Dots = actual precipitation totals. Solid red line = 5-year moving mean of annual precipitation. Red-shade = years when the moving mean is below long-term average. Blue -shade = years when the moving mean is above average. Note that long-term means were computed over different time periods and are not necessarily comparable to each other.

running average Tmax fluctuated but did not consistently increase or decrease (Figure 4b). The Tmax running average was 60.5 °F in 1962, 57.5 °F in 1982, and 59 °F in 2012.



**Figure 4.** Annual average daily maximum (Tmax) and minimum (Tmin) temperatures for Indiana Dunes National Lakeshore, 1989–2012 (a), and La Porte, Indiana, 1948–2012 (b). Black dots indicate measured temperature; green lines are 5-year running averages.