

# Commonly Asked Questions:

## NOAA Global Temperature Data Set

### Version 6.0.0

(NOAAGlobalTemp v6.0.0)

Updated 14 February 2024

#### About the Update

##### **Why is the data set being updated? Why is updating data sets good for users?**

NOAA periodically updates its data sets to provide the most accurate depiction of environmental conditions. This updated data set ensures that researchers, businesses, and industry have the best available information to develop tools, products, services, and assessments for decision making and that scientists can use in their research. The data set is used by NCEI in the development of the monthly Global Climate Report. Other science-driven organizations in academic and economic sectors also use the data set for global climate monitoring and applications.

#### Changes from Version to Version

##### **What updates does this version introduce?**

NOAAGlobalTemp v6.0.0 is an updated version to the current operational release (v5.1.0). Version 6.0.0 employs an Artificial Neural Network method to improve the surface air temperature reconstruction over land surfaces. This method replaces the original empirical orthogonal teleconnection (EOT) method used in previous versions of NOAAGlobalTemp.

##### **What are the data sets used in this new version?**

NOAAGlobalTemp v6.0.0 uses the same data sets as the previous version, including [GHCNm v4.0.1](#), [ERSST v5.0.0](#), and air temperature data from the International Comprehensive Ocean-Atmosphere Data Set ([ICOADS](#)) and the International Arctic Buoy Program ([IABP](#)).

##### **Does this mean that NOAA's past global climate analyses weren't as accurate as the new version will be?**

As technology improves and additional data sources become available, it is essential to update these data sets in order to provide the most accurate depiction of the Earth's environmental conditions. The new version of NOAAGlobalTemp improves the surface temperature

reconstruction over land surfaces, and while ranks and anomalies may change slightly, the previous version and the new version are very close to each other and the main conclusions regarding global climate change are very similar to the previous version:

- Global trends over decadal and longer time scales are consistent.
- The 10 warmest years on record have occurred since 2010 and the last nine years (2014-2022) are the nine-warmest years on record.

### **How did NOAA NCEI get climate data from as far back as 1850?**

NCEI's archives contain limited land and ocean data back to the mid-19th century. Our improved methodology, in combination with these limited observations, allowed us to produce full coverage back to 1850.

## Operational Uses

### **How can the operational data set be accessed?**

As of February 2024, NOAA GlobalTemp v6.0.0 is available from NCEI at <https://www.ncei.noaa.gov/data/noaa-global-surface-temperature/v6/>

It is available in netCDF format.

### **How will the operational data set be used by NCEI?**

The data set will be used to produce the Global State of the Climate report for January 2024 and henceforward for future reports and global monitoring. The [global section of the Climate at a Glance tool](#) will also be updated in mid-February 2024 to use the new version of the data set.

### **Beyond NCEI, who will use it, and what kind of studies does it contribute to?**

Atmospheric research scientists and private sector interests constitute the major users of the data set. Scientists around the world consider global surface temperature a critical component to help understand Earth's climate. Private sector interests use the data set to assess related monthly factors, such as pending heating and cooling costs, or trends in the same. They use the data for global climate monitoring and assessment, environmental research, and informational products and services for various industries and economic sectors, such as agriculture.

### **Does the new version change the conclusions regarding global temperature increases?**

Trends using the updated data set (v6.0.0) are statistically consistent with the previous version over decadal and longer time scales.

## Peer-Review Process/Transparency

**What kind of testing and peer-review does the data set undergo before NCEI releases it for use?**

As a matter of course, scientists with NCEI used a series of quality assurance tests to ensure the accuracy and integrity of NOAAGlobalTemp version 6.0.0 as compared to the previous version. This updated version underwent scrutiny to validate its results. The methodology of the data set was reviewed within NOAA and by peers in the global studies community. A series of readiness reviews took place before the final public release. A review journal article about the new version was published in 2022 in the *Artificial Intelligence for the Earth Systems* journal:

Huang, B., X. Yin., M.J. Menne, R. Vose, H.-M. Zhang, 2022: Improvements to the Land Surface Air Temperature Reconstruction in NOAAGlobalTemp: An Artificial Neural Network Approach. *Artificial Intelligence for the Earth Systems*, 1:4 <https://doi.org/10.1175/AIES-D-22-0032.1>

**What do scientists do with user feedback once the data set is released?**

NCEI scientists regularly review user feedback and evaluate its scientific value. Feedback with scientific merit and/or potential to support U.S. economic interests is used in future improvements of this product.