Daily accumulated temperature maps and short-term forecasts to support research, management, and planning

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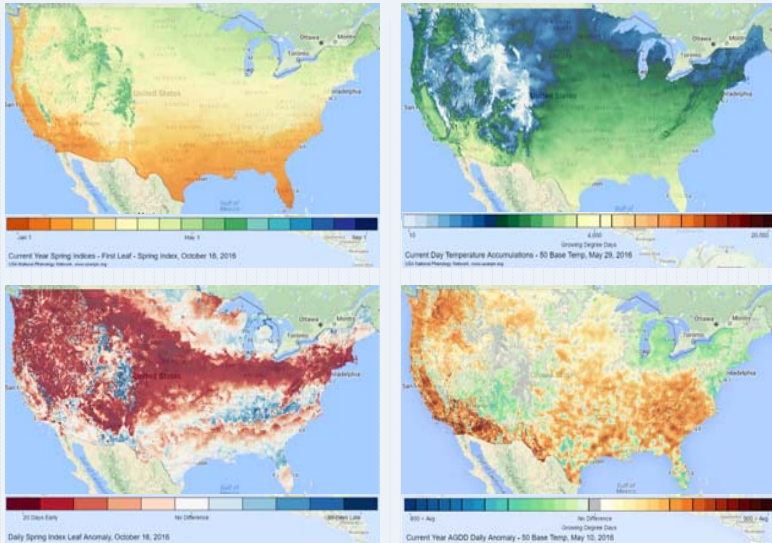
AGDD Start date: Jan 1
Temporal period: Jan 1 – 6 days in future
Base temps: 32°F (0°C) and 50°F (10°C)
Spatial resolution: 2.5 km

Climate data sources: NOAA NCEP (URMA, RTMA and NDFD); PRISM Anomalies relative to 1981-2010 mean

The USA National Phenology Network produces and distributes daily national maps of accumulated temperatures and spring onset dates as part of a growing suite of phenology map products.

The USA-NPN generates and distributes daily Accumulated Growing Degree Day maps using a January 1 start date and two base temperatures, 32ºF and 50◦F. Maps are constructed using NOAA National Centers for Environmental Prediction (NCEP) Real-Time Mesoscale Analysis (RTMA)[1], NOAA National Weather Service National Digital Forecast Database[2] and PRISM[3] gridded temperature products and are available at 2.5 km spatial resolution.

AGDD products available from USA-NPN include:
- Contemporary (daily, current year) maps of AGDD
- 6-day forecast maps of AGDD
- Daily anomaly maps of AGDD (current day compared to 30-year [1981-2010] mean for day)
- Daily 30-year mean temperature accumulations
- Daily minimum and maximum temperature values for current year

To assess the level of uncertainty in the USA-NPN AGDD products, we compare our URMA/RTMA-based calculations of Accumulated Growing Degree Days to those made using measurements from U.S. Climate Reference Network stations, accessed via the Applied Climate Information System, in the AGDD Uncertainty Assessment Dashboard:
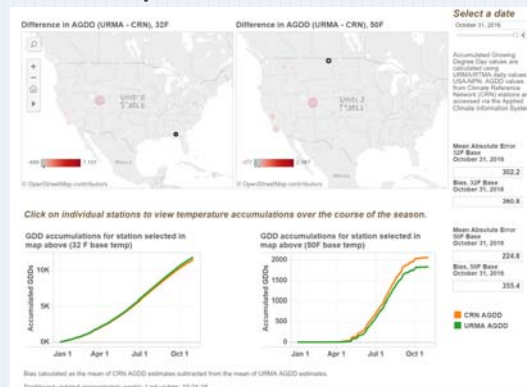
usanpn.org/agdd_uncertainty

The Spring Indices predict the biological start of spring as a threshold event, based on models based on early spring shrub leaf out and bloom events[4,5]. These indices have value for applications including predicting fire season or drought risk, assessing growing season length, and evaluating inter-annual patterns of variability and change in the timing of spring. The Spring Indices have been included as national-scale indicators of climate change responses[6,7].

Spring Index products available from USA-NPN include:
- Current year maps of Spring Index First Leaf and First Bloom dates
- 6-day forecast maps of Spring Index First Leaf and First Bloom dates
- Current year anomaly maps of First Leaf and First Bloom dates (compared to 30-year mean)
- Annual First Leaf and First Bloom date maps, 1981-2015
- 30-year (1981-2010) mean maps for First Leaf and First Bloom dates

The USA National Phenology Network invites you to use freely available daily and short-term forecast maps of accumulated growing degree days and spring onset dates at fine spatial scale for the conterminous United States.

- Maps can be viewed independently or in conjunction with in-situ plant or animal phenology observation data using the online USA-NPN Visualization Tool (www.usanpn.org/data/visualizations)
- Map images (.png, .gif, .pdf) or WCS and WMS raster data files (GeoTiff, ArcGrid, NetCDF) are freely available and can be downloaded using the USA-NPN Geoserver Request Builder page (www.usanpn.org/geoserver-request-builder)
- Web services are available via the USA-NPN Geoserver (geoserver.usanpn.org/geoserver/wms?request=GetCapabilities)
- Interpretive materials available at www.usanpn.org/data/phenology_maps

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The USA National Phenology Network serves science and society by promoting broad understanding of plant and animal phenology and its relationship with environmental change.