Appendix: NDFD Input Type

2006-05-16, Acrobat Distiller

Overview

The National Digital Forecast Database (NDFD) XML Web Service from the NWS is a web service that sends NDFD forecast data from the NWS web site listed above to a requesting Data Service through the Simple Object Access Protocol (SOAP). The data retrieved is in an XML format as specified by Digital Weather Markup Language (DWML) format and schema.

To use the forecast data, a Data Service will first make a request to the NDFD Web Service via the SOAP for getting either instantaneous or daily average data at the following web address:

http://www.weather.gov/forecasts/xml/DWMLgen/wsdl/ndfdXML.wsdl

This site provides the following forecast data using web services (see the following table for corresponding data type strings):

- Maximum Temperature*
- Minimum Temperature*
- 3 Hourly Temperature*
- Dewpoint Temperature
- Apparent Temperature
- 12 Hour Probability of Precipitation*
- Liquid Precipitation Amount*
- Snowfall Amount*
- Cloud Cover Amount
- Relative Humidity
- Wind Speed
- Wind Direction
- Weather
- Wave Heights

*Primary data types for Data Services

These data can be instantaneous or a daily average and are available as a grid. This implies that the Data Services can be called iteratively to obtain a geospatial context to the time-series data. The following tables show the necessary parameters needed to retrieve data from the NDFD database site for instantaneous and daily average data respectively (Tables courtesy of NWS). These data are retrieved through a Web service implementing a SOAP interface. There are two SOAP functions that need to be called by the Data Service implementation: the first is NDFDgen() which is used to retrieve instantaneous time-series data; the second function is NDFDgenByDay() that is used to retrieve daily average data. The following tables reflect the parameters needed to call these two NDFD SOAP functions respectively.

Additional reference information on the NWS NDFD SOAP implementation, functions, and time series input type can be retrieved from the NWS forecast site:

http://www.nws.noaa.gov/xml

Input variables to the NDFDgen() method

Input Name	Type	Example	Description
Latitude	Decimal	39.0000	The latitude of the point for which you want NDFD data. North latitude is positive.
Longitude	Decimal	-77.0000	The longitude of the point for which you want NDFD data. West longitude is negative.
Product	String	time-series	There are two products. The "time-series" product returns all data between the start and end times for the selected weather parameters. The "glance" product returns all data between the start and end times for the parameters maxt, mint, sky, wx, and icons
Start time	XML Date String	2004-04-27T12:00	The beginning time for which you want NDFD data. If the string is empty, the start time is assumed to be the earliest available time in the database.
End time	XML Date String	2004-04-30T12:00	The ending time for which you want NDFD data. If the string is empty, the end time is assumed to be the last available time in the database.
Parameters	Array of Booleans	maxt = TRUE	The parameters that you want data for. Valid parameters include the following:

Maximum Temperature	maxt
Minimum Temperature	mint
3 Hourly Temperature	temp
Dewpoint Temperature	dew
Apparent Temperature	appt
12 Hour Probability of Precipitation	pop12
Liquid Precipitation Amount	qpf
Snowfall Amount	snow
Cloud Cover Amount	sky
Relative Humidity	rh
Wind Speed	wspd
Wind Direction	wdir
Weather	wx
Weather Icons	icons
Wave Height	waveh

Input variables to the NDFDgenByDay() method

Input Name	Type	Example	Description
Latitude	Decimal	39.0000	The latitude of the point for which you want NDFD data. North latitude is positive.
Longitude	Decimal	-77.0000	The longitude of the point for which you want NDFD data. West longitude is negative.
Format	String	12 hourly	There are two formats. The "24 hourly" format returns NDFD data summarized for a 24 hour period running from 6:00 AM to 6:00 AM. The "12 hourly" format summarizes NDFD data into two 12 hour periods per day that run from 6:00 AM to 6:00 PM and 6:00 PM to 6:00 AM
Start Date	XML Date String	2004-04-27	The beginning day for which you want NDFD data. If the string is empty, the start date is assumed to be the earliest available day in the database.
Number of Days	Integer	7	The number of days worth of NDFD data you want.

Standard Time Series Properties

The standard time series identifier (TSID) for NWS NDFD time series files is of the form:

```
Latitude_Longitude.NWS.DataType.Interval~NDFD~Server
```

Where:

- The TSID location is a latitude and longitude value and will fall within a grid cell of calculated forecast data. This location is based on the NWS latitude and longitude definition and will have the form `nnnnnn_mmmmmm` where `nnnnnn` will be translated to `nn.nnnn` and `mmmmmm` will be translated to `-mm.mmmm`. These translations are used because the web service only applies to the United States. For example, latitude 40.1800 and longitude –105.0600 would be specified as `401800_1050600`.
- The TSID data source is `NWS` since the data is coming from the National Weather Service.
- The *DataType* will be one of the data parameters described in the first table. Daily average data will only accept maxt, mint, and pop12 parameters. See the following table for a matrix of data types for available for either instantaneous or daily average data.
- The *Interval* is the data interval to retrieve forecast data. This would be of the form: `nHour` where `n` is `2`, `3`, `4`, `6`, `8`, `12`, or `24` for instantaneous data or `Day` for daily average data averaged over 24 hours respectively.
- `NDFD` is used for the input type.
- The *Server* is an optional parameter to specify the NDFD web service server. Currently there is only one server: www.nws.noaa.gov/forecasts/xml that is the default.

Matrix of Data Types

Data Type	Intervals	Description	SOAP Function Used
maxt	2,3,4,6,8,12,24, or day	Maximum instantaneous or daily average temperature over a given time period	NDFDgen() and NDFDgenByDay()
mint	2,3,4,6,8,12,24, or day	Minimum instantaneous or daily average temperature over a given time period	NDFDgen() and NDFDgenByDay()
temp	2,3,4,6,8,12, or 24	Instantaneous temperature at the time interval at the time interval over a given time period	NDFDgen()
dew	2,3,4,6,8,12, or 24	Instantaneous dew point temperature at the time interval over a given time period	NDFDgen()
pop12	2,3,4,6,8,12,24, or day	12 hour probability of precipitation over a given time period	NDFDgen() and NDFDgenByDay()
qpf	2,3,4,6,8,12, or 24	Instantaneous liquid precipitation amount at the time interval over a given time period	NDFDgen()
appt	2,3,4,6,8,12, or 24	Instantaneous apparent temperature at the time interval at the time interval over a given time period	NDFDgen()
snow	2,3,4,6,8,12, or 24	Instantaneous snowfall amount at the time interval over a given time period	NDFDgen()
sky	2,3,4,6,8,12, or 24	Instantaneous cloud cover at the time interval over a given time period	NDFDgen()
rh	2,3,4,6,8,12, or 24	Instantaneous relative humidity at the time interval over a given time period	NDFDgen()
wspd	2,3,4,6,8,12, or 24	Instantaneous wind speed at the time interval over a given time period	NDFDgen()
wdir	2,3,4,6,8,12, or 24	Instantaneous wind direction at the time interval over a given time period	NDFDgen()
wx	2,3,4,6,8,12, or 24	Instantaneous weather conditions at the time interval over a given time period	NDFDgen()
waveh	2,3,4,6,8,12, or 24	Instantaneous wave height at the time interval over a given time period	NDFDgen()

Limitations

The NDFD input type has the following limitations:

- Latitude and longitude rather than a station ID specifies the location. Therefore to retrieve data at a location matching a station, the latitude and longitude of the station must first be determined.
- The NWS NDFD web service only serves data for the United States. Thus a request that uses a latitude and longitude that falls outside the United States will return missing data.