Transformation - InterpolationSerial TrackToGrid

schema:	transformationTypes.xsd
keywords:	transformation, interpolation

Description and Usage

This transformation function is used to interpolate data stored as a track to a grid. This track should consist of three scalar time series: latitude, longitude and values. The transformation function takes the three track input time series and links each output value (each combination of grid cell and time) in the output series to a list of track values (exactly those values for which the coordinates are contained in the grid cell and the track time is closest to this time). A statistical function is then applied to this list of track values to obtain a value for the output time series. Currently only min and max are available. Note that the transformation expects the latitude and longitude for the track to have geoDatum WGS 1984, and expects the grid to have this geoDatum as well.

Optionally, a minimum number of track values can be specified, in which case a grid cell and time combination must be linked to at least that number of track values for the output to be non-missing. Also optionally, a percentile range can be provided to ensure a certain percentage of the lowest and/or highest values is discarded before applying the statistical function. Note that if both a minimum number of track values and a percentile range are specified, the minimum is checked before the percentile range is applied.

The transformation will only produce a missing value if there are no or too few track values available for a grid cell and time.

Input/Output time series

This function takes three input time series and produces one output time series.

- <inputTrackValue>: A scalar time series containing the value for each track point.
- <inputTrackX>: A scalar time series containing the longitude for each track point.
- <inputTrackY>: A scalar time series containing the latitude for each track point.
- <outputVariable>: A grid time series.

Configuration

A basic configuration of the function is described below. This describes the main elements and attributes required and provides an example configuration.

<inputTrackValue>
Required element defining the identifier of the scalar input time series with track values. The input time series referenced must be scalar and have the same times, i.e., the same <timeStep> and <relativeViewPeriod> as the time series used for <inputTrackX> and <inputTrackY>.

<inputTrackX>
Required element defining the identifier of the scalar input time series with longitude input values. The input time series referenced must be scalar and have the same times, i.e., the same <timeStep> and <relativeViewPeriod> as the time series used for <inputTrackValue> and <inputTrackY>.

<inputTrackY>
Required element defining the identifier of the scalar input time series with latitude input values. The input time series referenced must be scalar and have the same times, i.e., the same <timeStep> and <relativeViewPeriod> as the time series used for <inputTrackValue> and <inputTrackX>.

<minTrackValues>
Optional element defining the minimum number of track values for an output value to be non-missing. If both this element and the <percentileRange> element are provided, the check on the minimum number is made before applying the <percentileRange>.

<percentileRange>
Optional element defining a <min> and <max> value for the percentile range. For example, configuring <min> as 0 and <max> as 95 will result in the highest 5% of track values to be discarded before applying the statistical function.

<statisticalFunction>
Required element defining the statistical function to be used to obtain a single output value from the list of track values. Currently only "min" and "max" are available.

<outputVariable>
Required element defining the identifier of the output time series. The output time series referenced must be a grid which is expected to have geoDatum WGS 1984.

Example

```xml
<transformation id="interpolationSerial trackToGrid">
        <interpolationSerial>
                <trackToGrid>
                        <inputTrackValue>
                                <variableId>track_val</variableId>
                        </inputTrackValue>
                        <inputTrackX>
                                <variableId>track_lon</variableId>
                        </inputTrackX>
                        <inputTrackY>
                                <variableId>track_lat</variableId>
                        </inputTrackY>
                        <minTrackValues>4</minTrackValues>
                        <percentileRange>
                                <min>25</min>
                                <max>100</max>
                        </percentileRange>
                        <statisticalFunction>min</statisticalFunction>
                        <outputVariable>
                                <variableId>grid</variableId>
                        </outputVariable>
                </trackToGrid>
        </interpolationSerial>
</transformation>
```