

Product Description Document
Experimental NOAA NWS Runoff Risk Analysis Data for Great Lakes States

Part I – Mission Connection

Product Description – The National Weather Service (NWS) River Forecast Centers (RFCs) routinely and continuously simulate soil moisture conditions using various models to produce hydrologic forecasts to protect life and property and to enhance the Nation’s economy. As part of National Oceanic Atmospheric Administration’s participation in the Great Lakes Restoration Initiative (GLRI), the North Central River Forecast Center (NCRFC) and its neighboring River Forecast Centers are working together to develop and provide experimental runoff risk analysis data. The experimental runoff risk analysis data (Version 2) for the Great Lakes states is being made available to our users on an experimental basis. The experimental runoff risk analysis data consists of a suite of GeoTIFF gridded files depicting the daily runoff risk (from midnight to following midnight) on forecast days 1, 2, 3, and out to 10 days for the Great Lake states starting with Michigan, Minnesota, Ohio, and Wisconsin. The runoff risk analysis data for Illinois, Indiana, and New York will be provided at a later date.

- a. **Purpose/Intended use** - The development of the experimental runoff risk analysis data has been a multi-agency collaborative effort consisting of many federal and state agencies and academia. The state partners use the experimental runoff risk analysis data for optimized application of nutrients, which is expected to support safe water quality and healthy ecosystems in the nation’s streams, lakes, and coastal waters, such as the Great Lakes and the Gulf of Mexico. The United States Geological Survey’s description of this collaboration can be found at:
<http://wim.usgs.gov/geonarrative/glri-eof/>
- b. **Audience** – The target audience is federal and state environmental or natural resource agencies and academia looking for insight about soil moisture levels and the resultant sensitivity of the landscape to runoff events from future meteorological events such as snowmelt and rainfall.
- c. **Presentation Format** – The experimental runoff risk analysis data (Version 2) is a suite of geostationary earth orbit tagged image file format (GeoTIFF) gridded files (2km x 2km) with associated attribute information. The daily risk grids for each state represent the maximum risk in each midnight-to-midnight window. Each cell is assigned a value of categorical risk ranging from 0 to 4. A value of 0 or 1 represents no risk for that day. A value of 2, 3, or 4 represents either low, moderate, or high risk respectively

for that cell.

- d. **Product Availability** – The data files for the Great Lakes states are created at NCRFC at least once per day year-round and are available for download at https://www.weather.gov/ncrfc/RRAF_main
- e. **Feedback Method** – The NWS is seeking comments on the format and usability of the Experimental runoff risk analysis data (Version 2) for the Great Lakes states. Comments received will be used to determine if this product should be transitioned to operations for the Great Lakes states as well as to assess the viability and need for this information across the country.

Feedback may be provided through an online survey:

<http://www.nws.noaa.gov/survey/nws-survey.php?code=RRAF>

Comments may also be provided to:

North Central River Forecast Center
Attn: Dustin Goering and Steve Buan
1733 Lake Drive West
Chanhassen, MN 55317
952-361-6650
Dustin.Goering@noaa.gov, Steve.Buan@noaa.gov

Part II – Technical Description

The experimental runoff risk analysis data is based on event thresholds set by the state agencies and available as daily runoff risk grids for each state representing the maximum risk from midnight to the following midnight window out to 10 days.

The data is generated using the HL-RDHM model (version 3.5.11) running the Sacramento Soil Moisture Accounting model with Heat Transfer and Enhanced evapotranspiration (SAC-HTET). The model is driven with 7-days of forecast precipitation and 10-days of forecast temperatures. The model runs at least once a day on an hourly time-step out to 10 days. Various model states are analyzed to produce the runoff risk data. Iterative comparisons of simulated high resolution (4km x 4km) model states against observed edge-of-field (EOF) runoff thresholds are then used to develop the risk potential for surface runoff.

NCRFC converts the XMRG files to geostationary earth orbit tagged image file format (GeoTIFF) format and re-projects them to the Google Mercator projection (EPSG: 3857). This process results in a 2km x 2km runoff risk grid in geoTIFF

format with associated attribute information. The category levels for the runoff risk grids include No, Low, Moderate, and/or High Risk.