

# Hydrologic Extremes: The Elephant In The Closet

Public Water Supply Workshop  
October 18, 2018

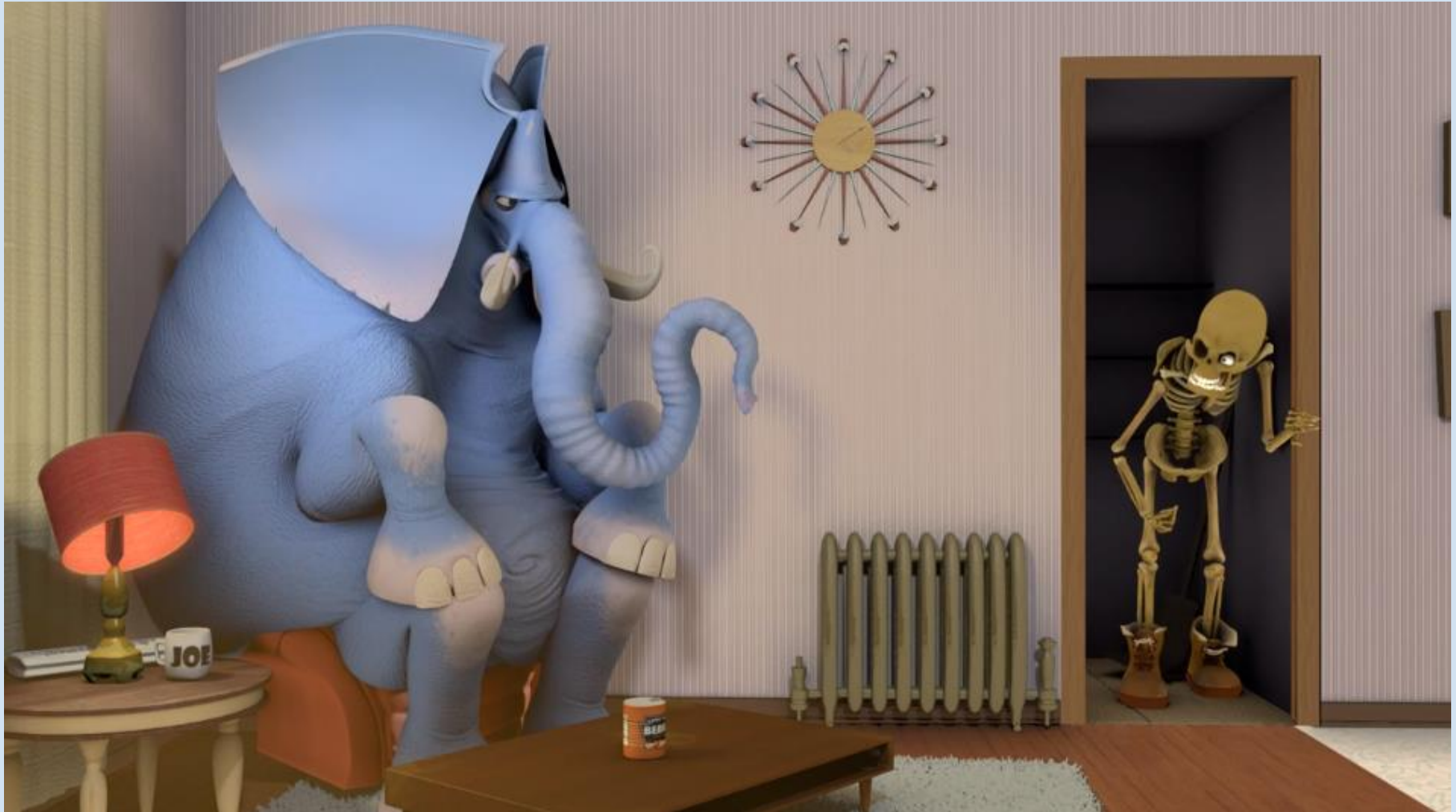
Benjamin A. Pratt PE, CFM  
Susquehanna River Basin Commission

# “Hydrologic Extremes”

- **Hydrology** - a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere (*Merriam Webster*)

## RAINFALL

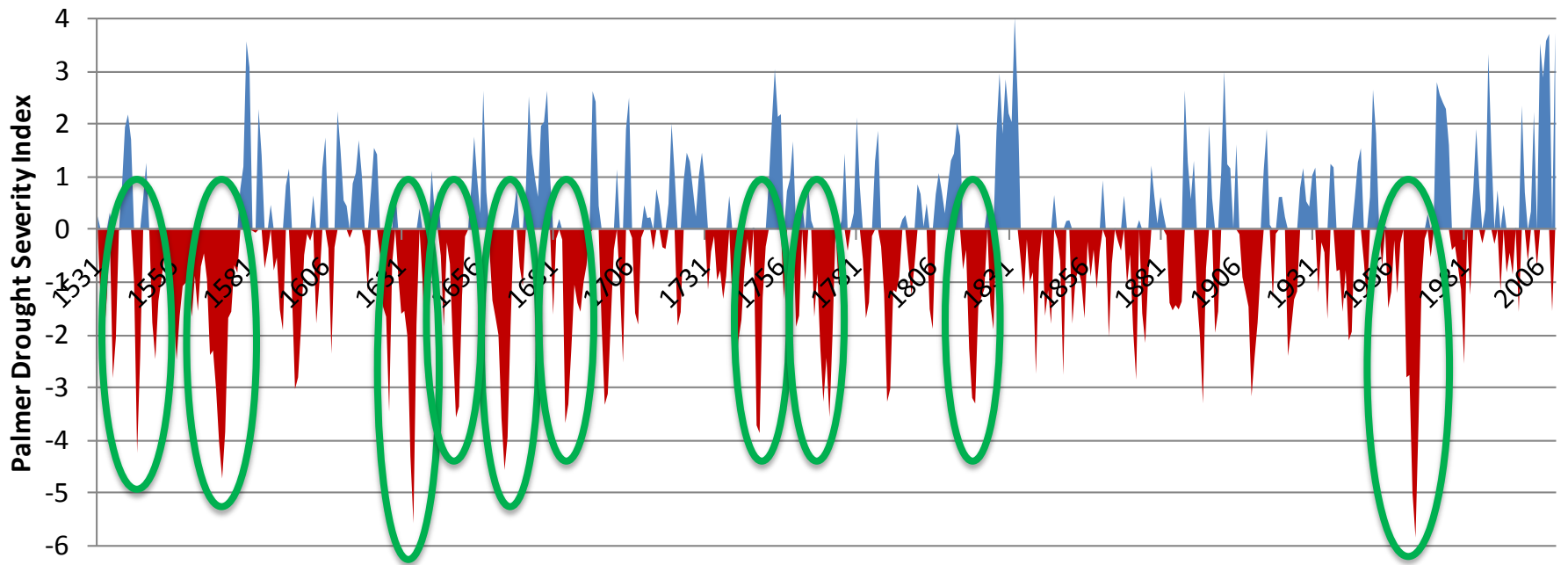
# “The Elephant in the Closet”



Credit: Amanda Koh/Mollie Helms Ringling College of Art & Design (From “Confessions of an Idiom” accessed via Vimeo)

# Historical Northeast Droughts

Drought planning isn't just for California and Texas!

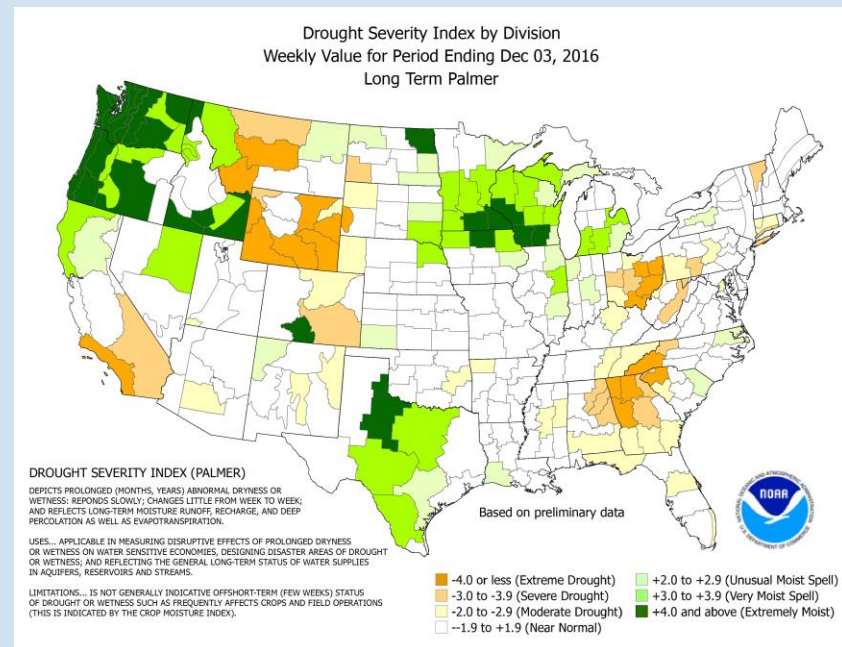


Pederson et al., 2013  
Tree Ring Laboratory, Lamont-Doherty Earth Observatory,  
Columbia University, Palisades, New York

# Drought Indices

Used to describe current drought conditions & trends to support decision making.

- Precipitation departures
- Soil moisture
- Streamflow
- Groundwater levels
- Reservoir storage
- Standardized Precipitation Index (SPI)
- Palmer Drought Severity Index (PDSI)
- Palmer Hydrologic Drought Index (PHDI)
- Soil Moisture Index (SMI)
- Crop Moisture Index (CMI)
- Surface Water Supply Index (SWSI)
- US Drought Monitor (USDM)
- Normalized Difference Vegetation Index (NDVI)



# Drought Coordination Plan

- Establishes Drought Coordinating Committee
- Summarizes authority for drought planning, coordination & management
- Defines drought & drought stages
  - Water supply drought
  - Drought watch, warning & emergency stages

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SUSQUEHANNA RIVER BASIN  
DROUGHT COORDINATION PLAN

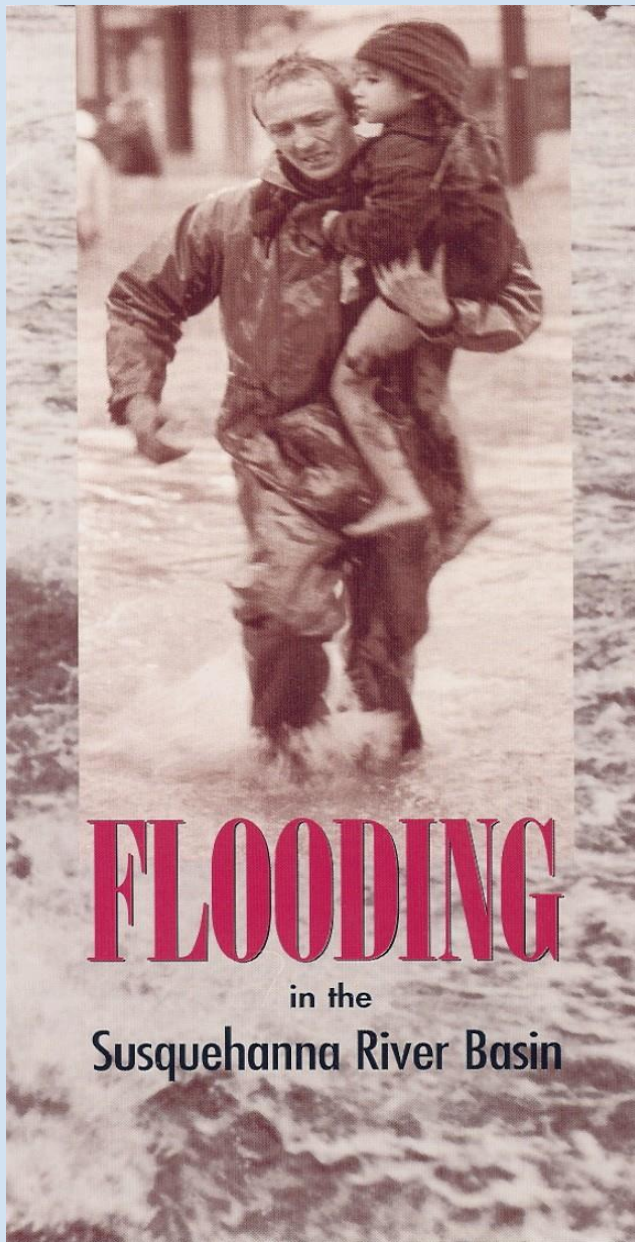
*Publication No. 212*

*August 10, 2000*

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*Stephen A. Runkle, P.E.  
Consulting Engineer*





## Major Floods in the Susquehanna Basin

1810	1936	1975
1865	1946	1996
1889	1955	2004
1894	1964	2006
1935	1972	2011

The Susquehanna basin is one of the most flood-prone watersheds in the entire country due to its physical location and topographic features.







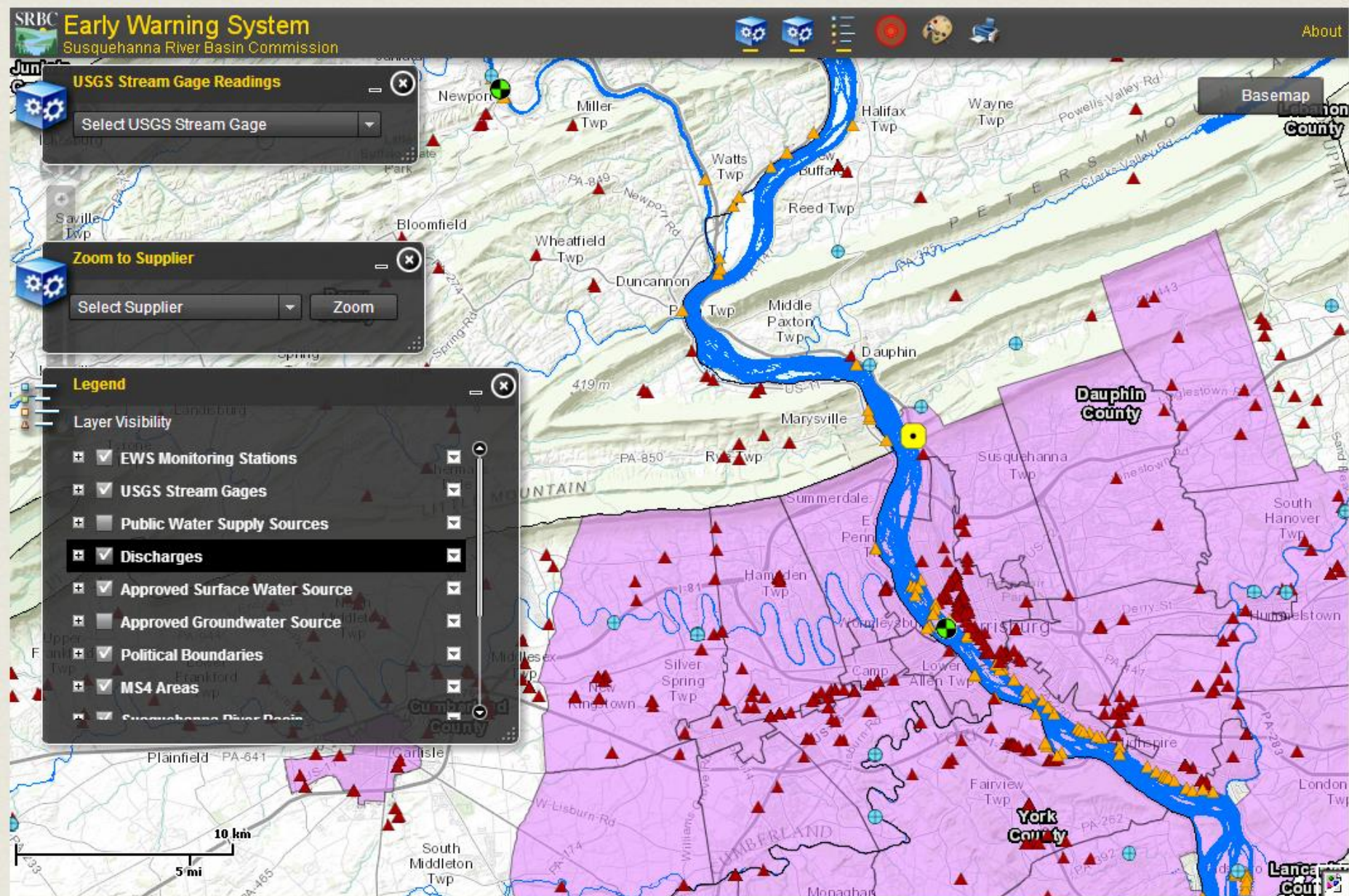








Graphs Raw Data Statistics Time of Travel Map





# “What can I do about it?”

- Embrace the elephant, bury the skeleton
- Develop a plan
- Reach out and touch someone
- Identify necessary pathways
- IMPLEMENT/EXERCISE



THANK YOU!

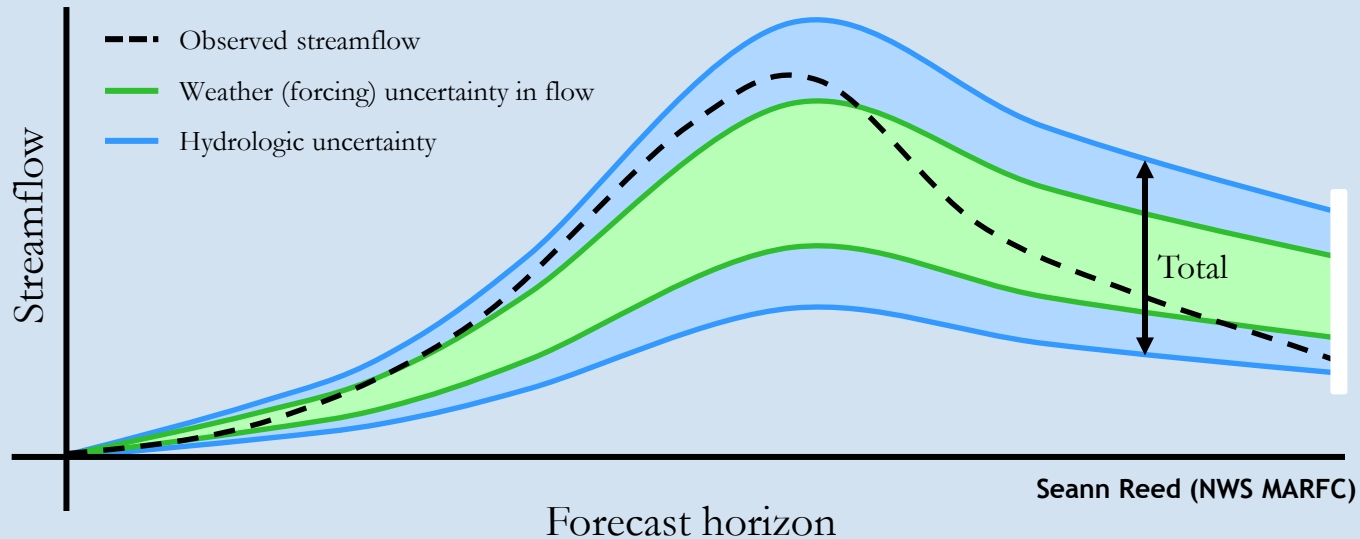


# Contact Info

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# Hydrologic Forecasts

## NWS Hydrologic Ensemble Forecast Service (HEFS)



- Aims to capture observed flow consistently
- Must account for total uncertainty in flow
  - Total = weather uncertainty + hydrologic uncertainty