PA – AWWA Conference Spring 2018

Developing a Meaningful Drought Contingency Plan

Virginia Thornton & Pat Caulfield, P.E.

May 10, 2018

Pennsylvania AWWA
American Water Works Association

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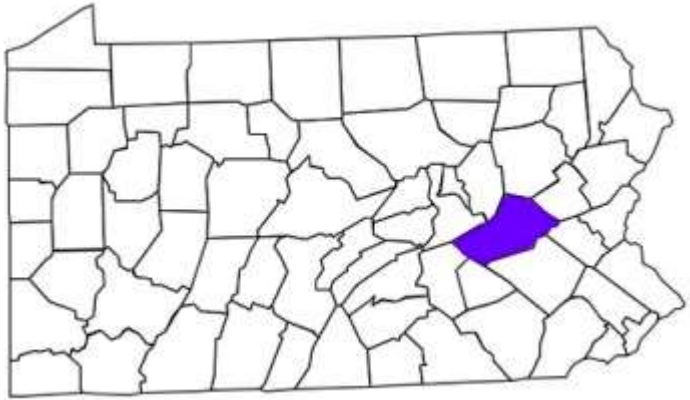
Pottsville System

- Origins in 1834
- 30,000 customers across 25 municipalities
- 6 surface water reservoirs totaling 1.675 Billion Gallons of Storage
- 4 groundwater wells



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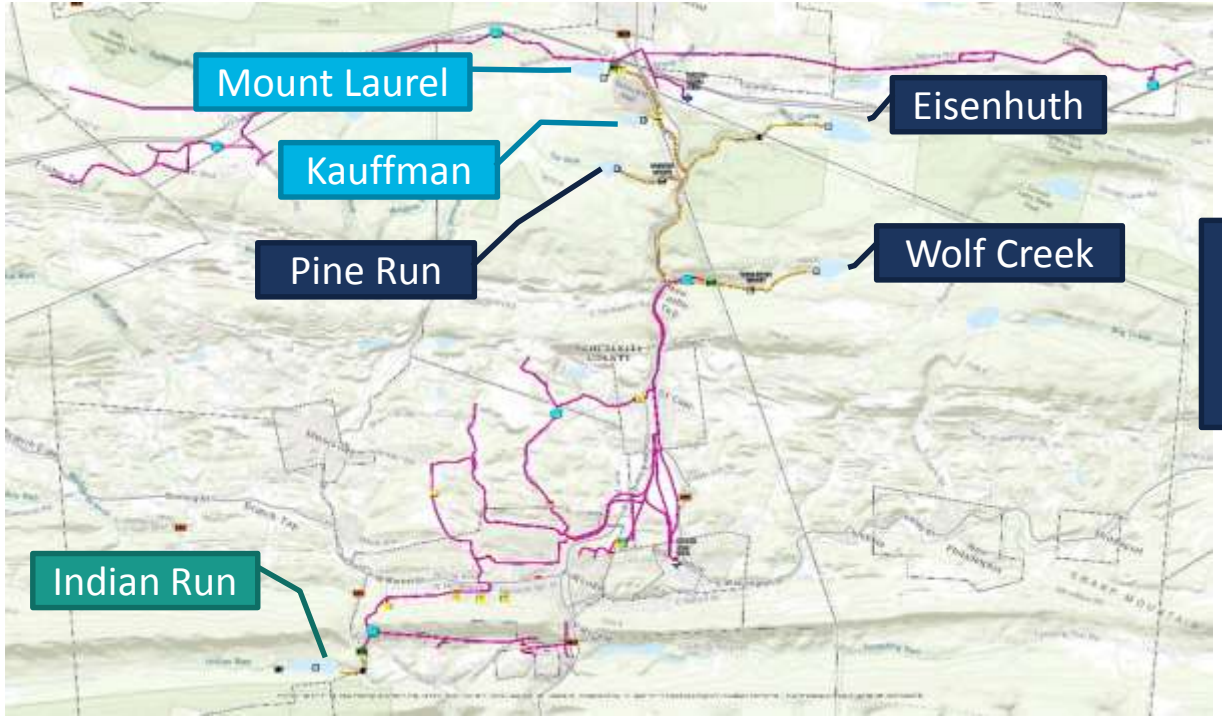
3 Raw Water Supply Systems



Mount Laurel WTP

Broad Mountain WTP

Indian Run WTP

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Broad Mountain Raw Water Supply System

Reservoir	Eisenhuth	Pine Run	Wolf Creek
Date Constructed	1875	1933	1909
Drainage Area (mi^2)	1.95	0.71	1.72
Normal Pool Storage (MG)	299	190	393
Normal Pool Area (ac)	49.5	25.5	45.0
Total System Storage	**882 MG**		

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Drought Contingency Planning

Watch

- Voluntary Restrictions

Warning

- Mandatory Water Restrictions

Emergency

- Rationing

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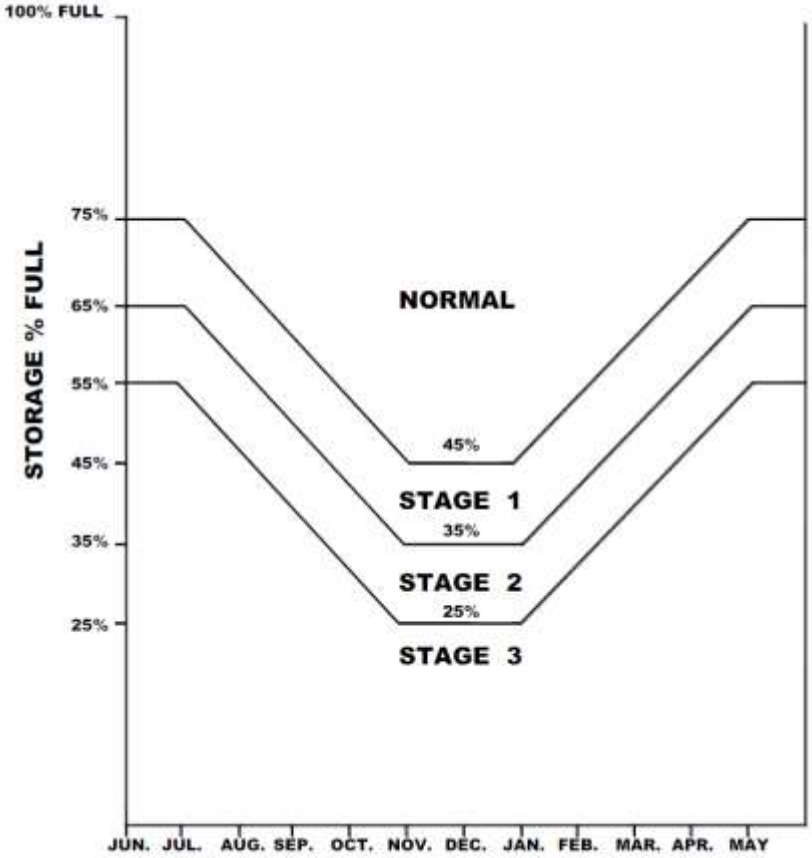
Traditional Drought Contingency Planning

Drought Management Guidelines for Public Water Suppliers, PADEP



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DOING MORE WITH WHAT YOU HAVE –

USING CUSTOM DAILY FLOW MODELS FOR SOURCE WATER INVESTIGATIONS

Greg Richards, P.E., CFM, Hydrologic & Hydraulic Engineer

Amanda Hess, P.E., CFM, Hydrologic & Hydraulic Group Manager

Paul Schweiger, P.E., CFM, Vice President

Kate Naughton, E.I.T., CFM, Hydrologic & Hydraulic Designer

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Safe Yield Study

The max. quantity of water that can be continuously withdrawn from the system during the most severe drought of record without exhausting supply.

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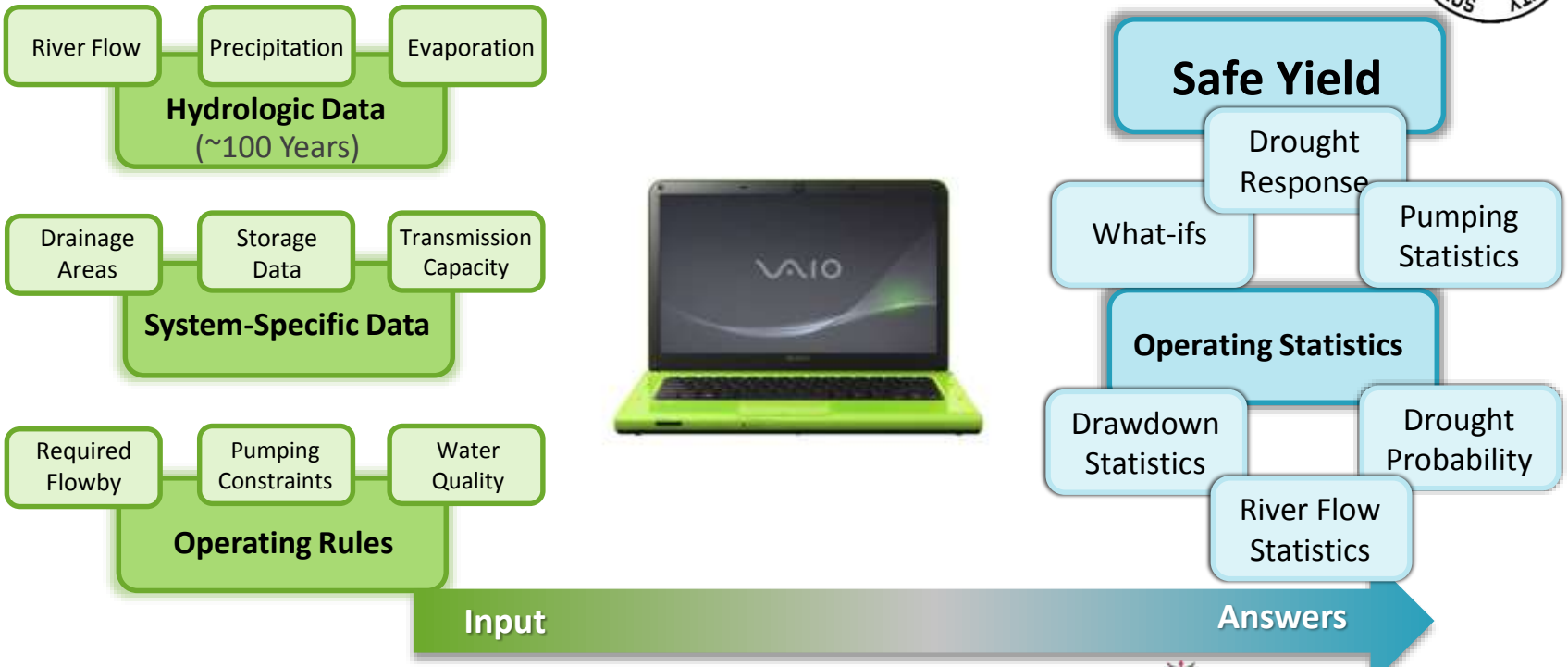
What is a daily flow model?



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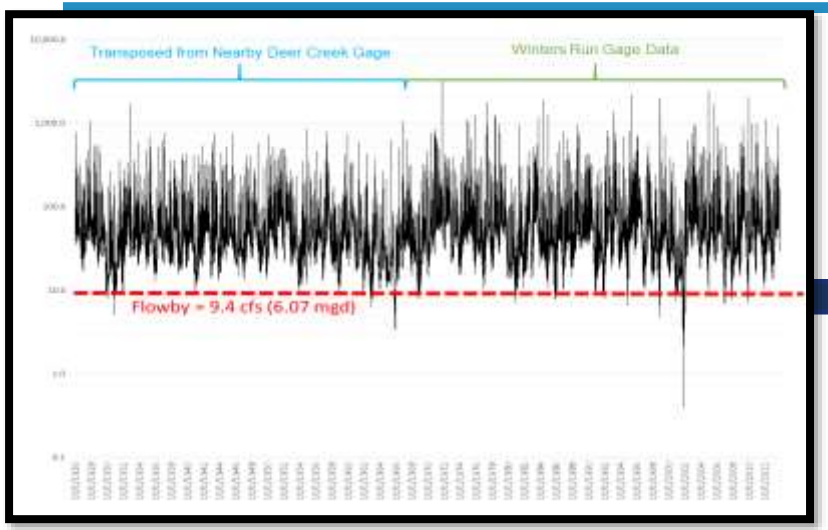
What is a daily flow model?



Assumed Operating Condition

- Availability of Water Supplies
- Storage Facilities
- Permit Conditions

1920

1950

2000

2017

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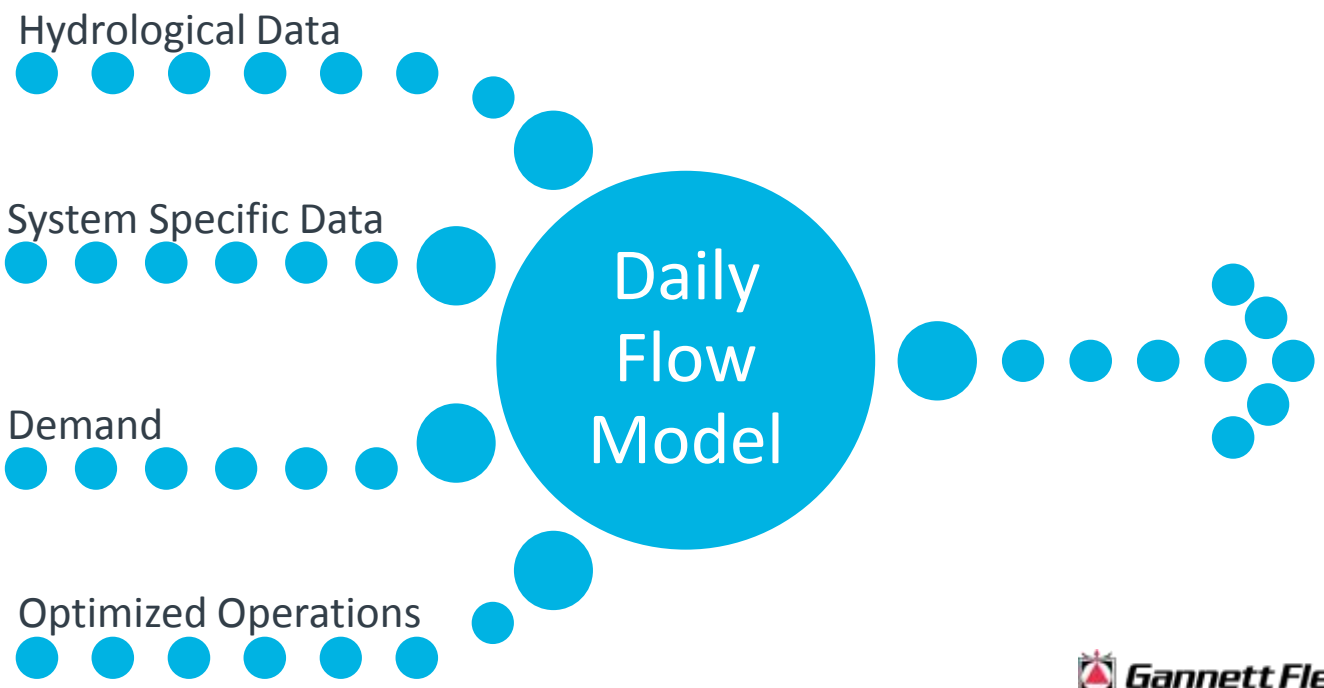
Broad Mountain RWSS Safe Yield Model



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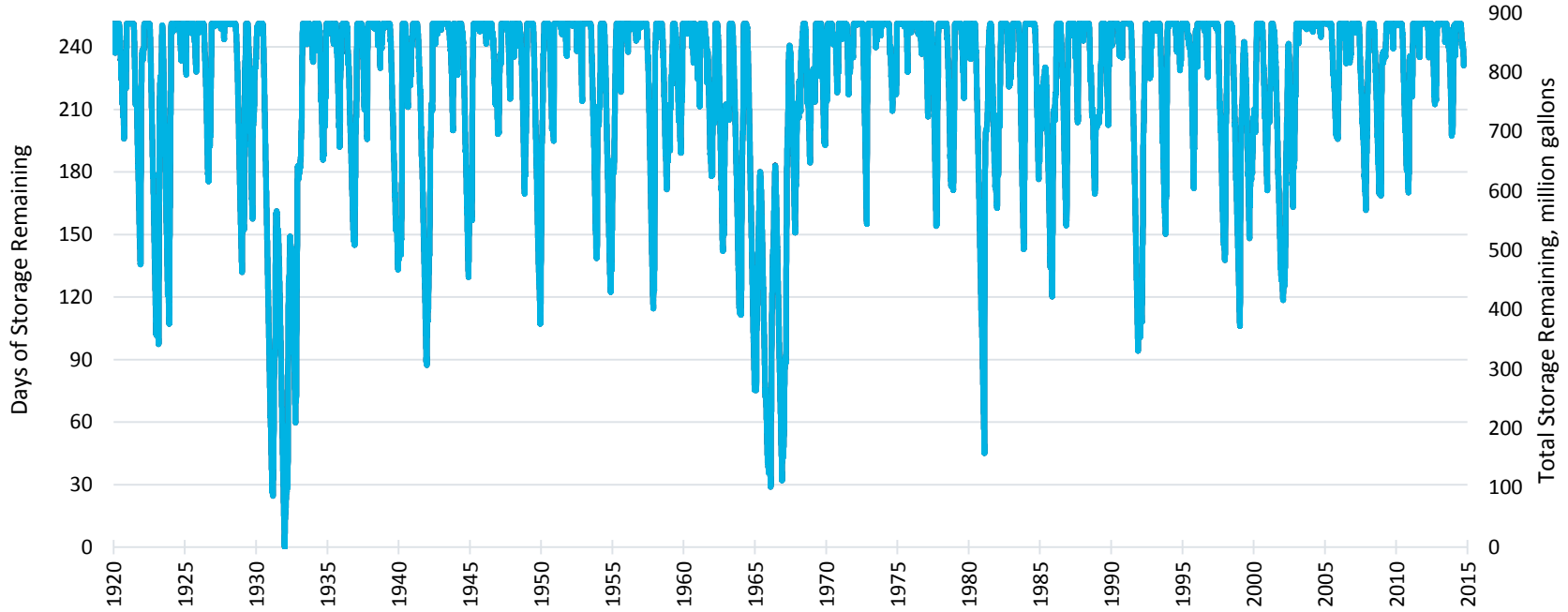
Model Output



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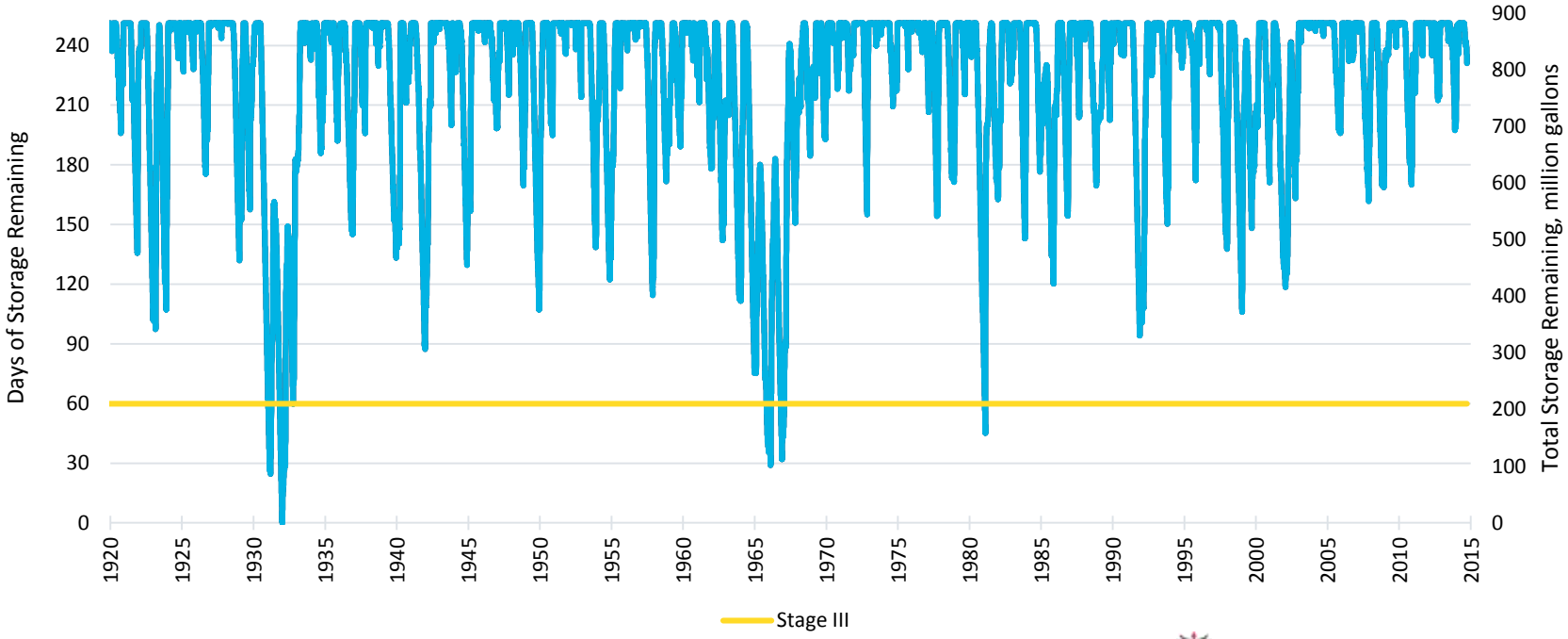
Stage III – Drought Emergency



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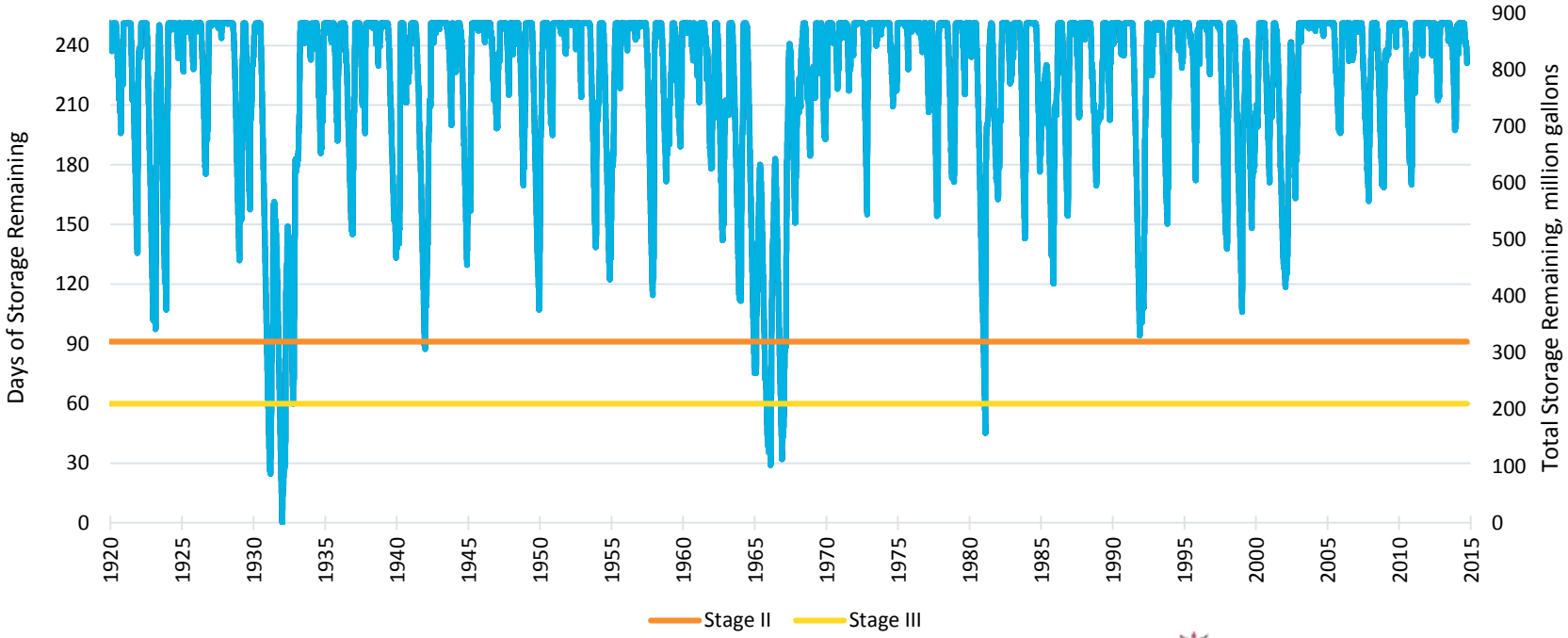
Stage II – Drought Warning



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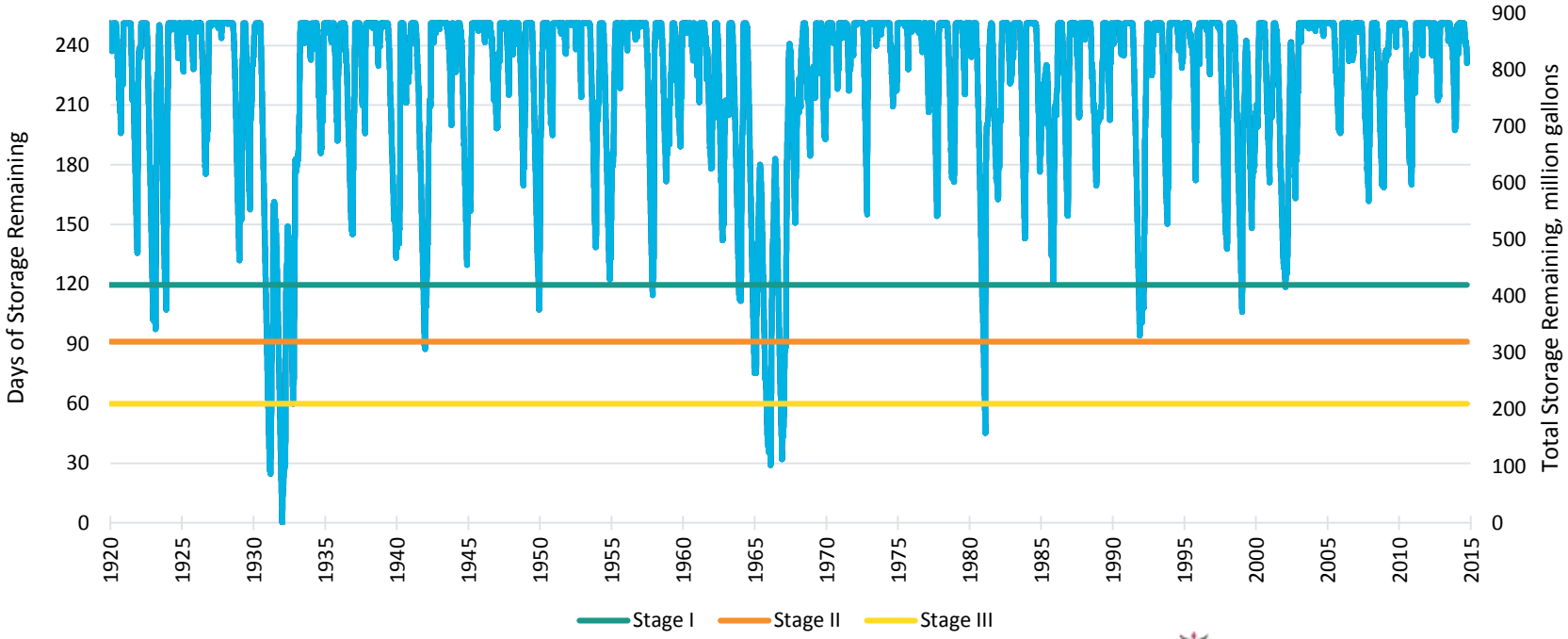
Stage I – Drought Watch



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Sanity Check

Watch

- Voluntary Restrictions – 5 - 10 years

Warning

- Mandatory Water Restrictions – 20+ years

Emergency

- Rationing – 50+ years

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Sanity Check

	Stage I	Stage II	Stage III
Trigger point, MG remaining	420	320	210
Trigger Point, % of Total Storage	50%	35%	25%
Days of Storage Remaining at S.Y.	120	90	60
Number of Events Triggered	12	4	3

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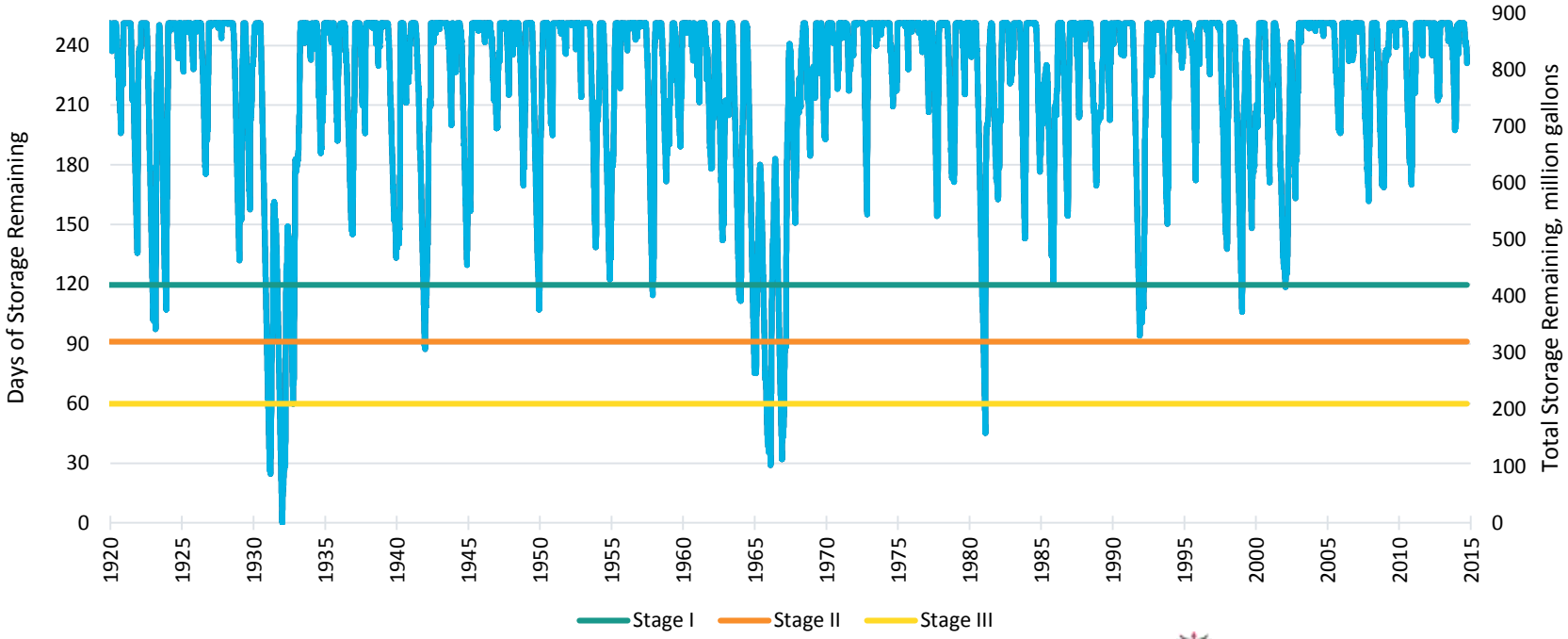
Demand = Safe Yield 3.51 MGD



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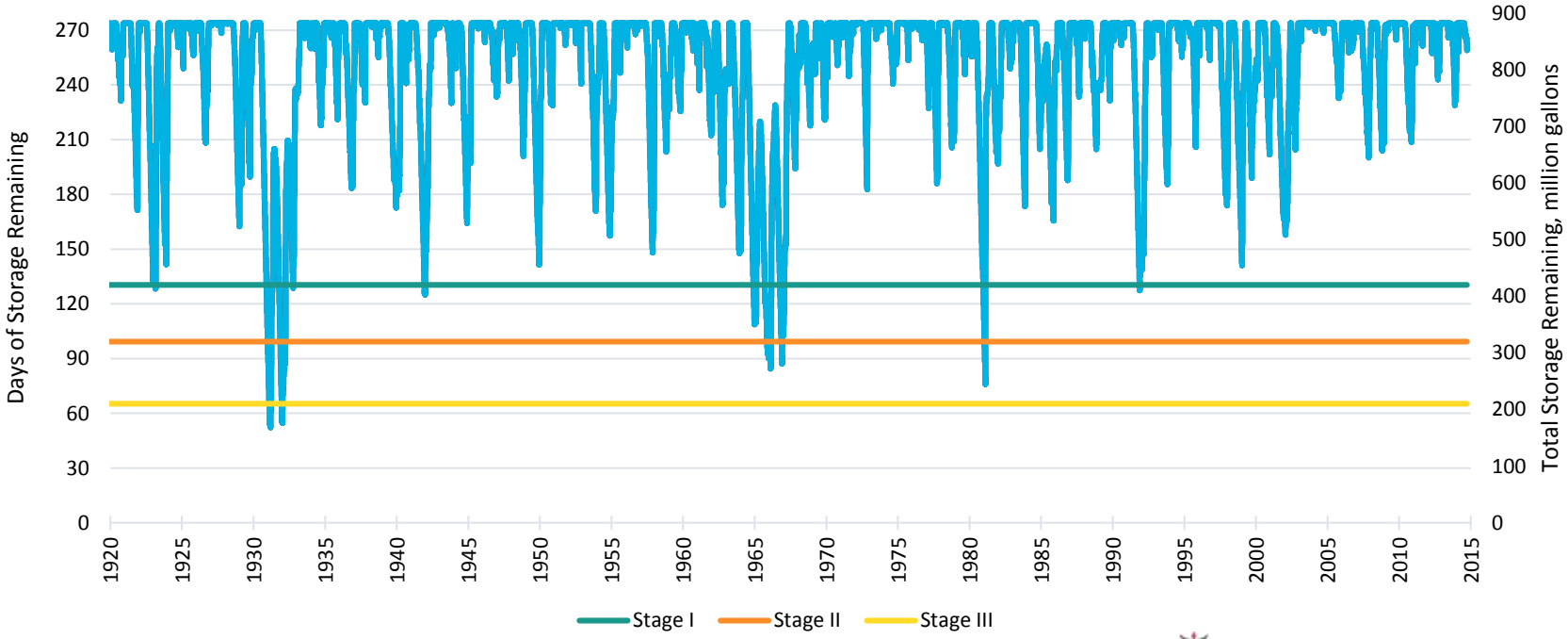
Demand = 2015 Demand 3.22 MGD



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Broad Mountain RWSS Drought Contingency Plan

	Stage I	Stage II	Stage III
Trigger point, MG remaining	420	320	210
Trigger Point, % of Total Storage	50%	35%	25%
Days of Storage Remaining at S.Y.	120	90	60

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SCHUYLKILL COUNTY MUNICIPAL AUTHORITY
WATER & WASTEWATER AT YOUR SERVICE SINCE 1834

DEVELOPING A MEANINGFUL DROUGHT CONTINGENCY PLAN

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