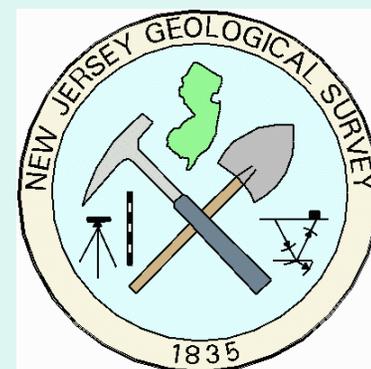


# Use of Drought Monitoring Data in NJ

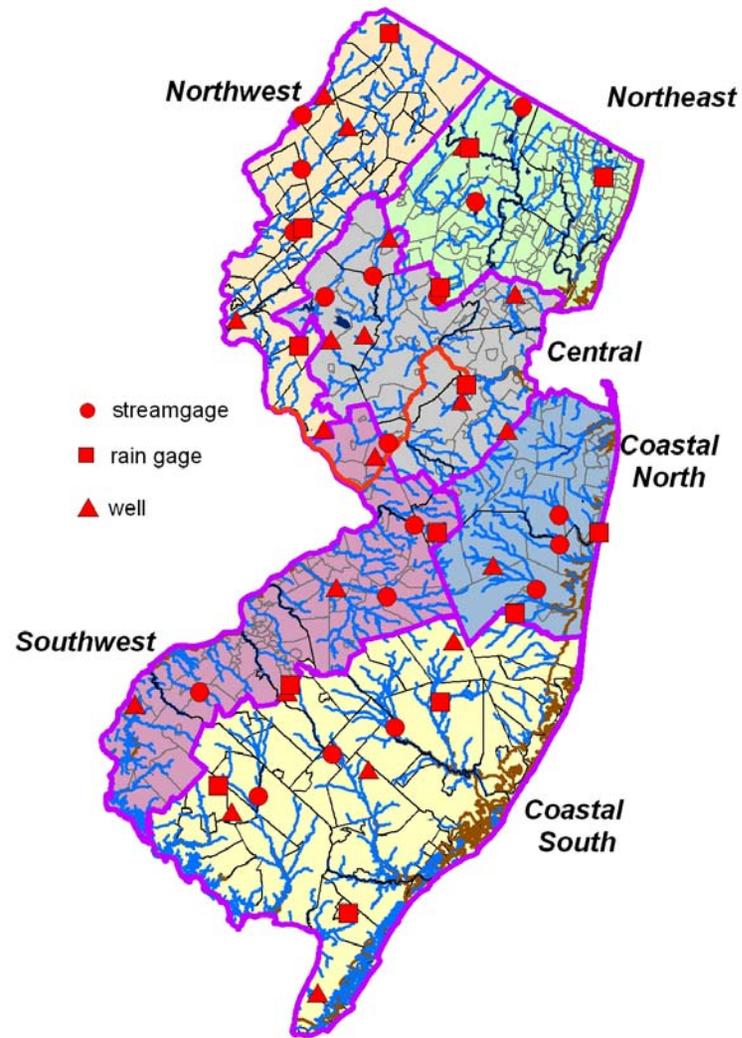
Jeffrey L. Hoffman  
NJDEP - NJGS



Presented at:  
NJ Water Monitoring Council Meeting  
May 31, 2006



# Drought Regions in New Jersey



# Regional Indicators

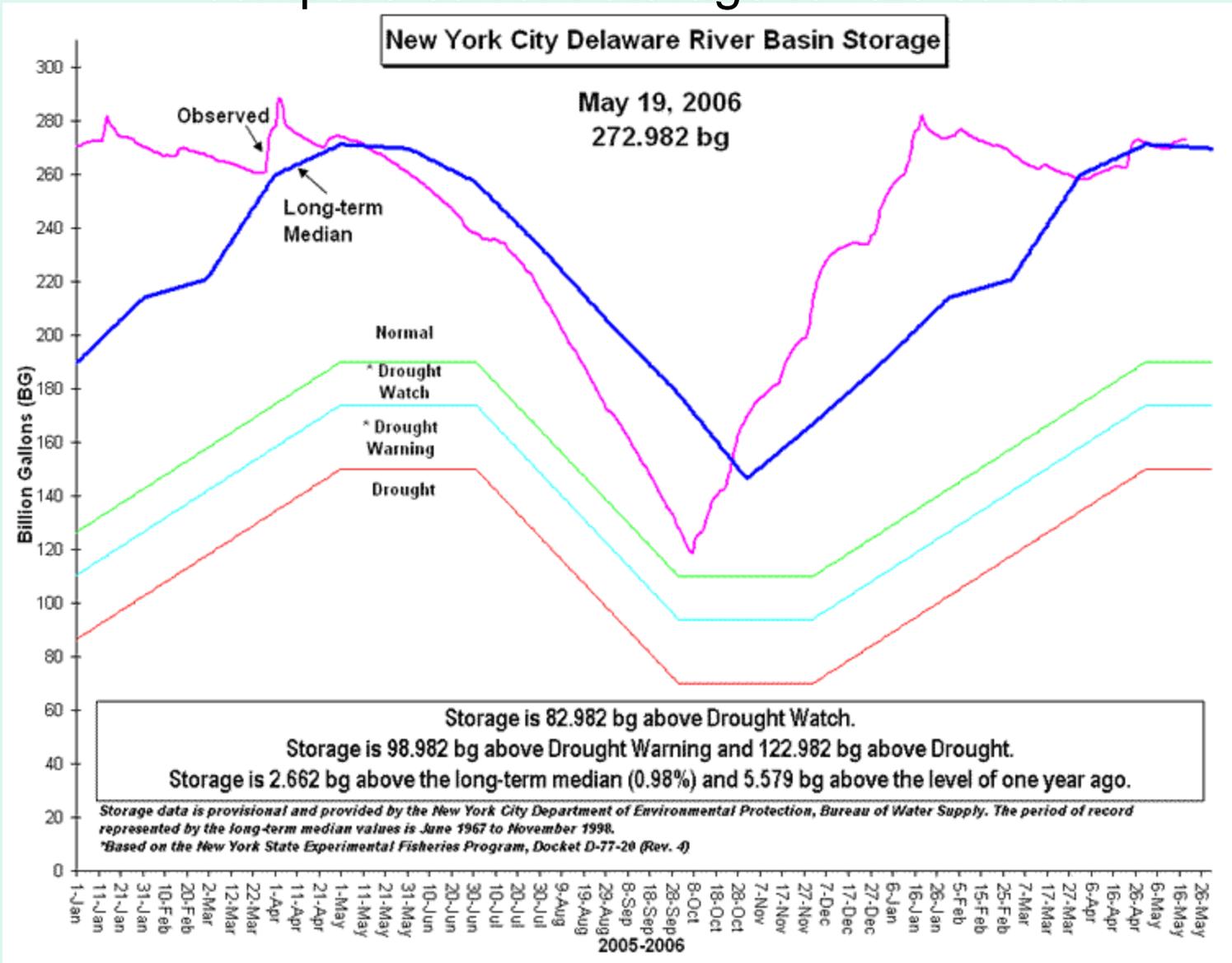
- Indicate hydrologic conditions.
- Concisely convey information to decision makers & the public.
- Designed to be updated quickly using real-time data.
- They are indicators, not triggers.

# Regional Indicators

- reservoirs (NJ & NY)
- ground-water levels
- precipitation
- streamflow

# Reservoirs

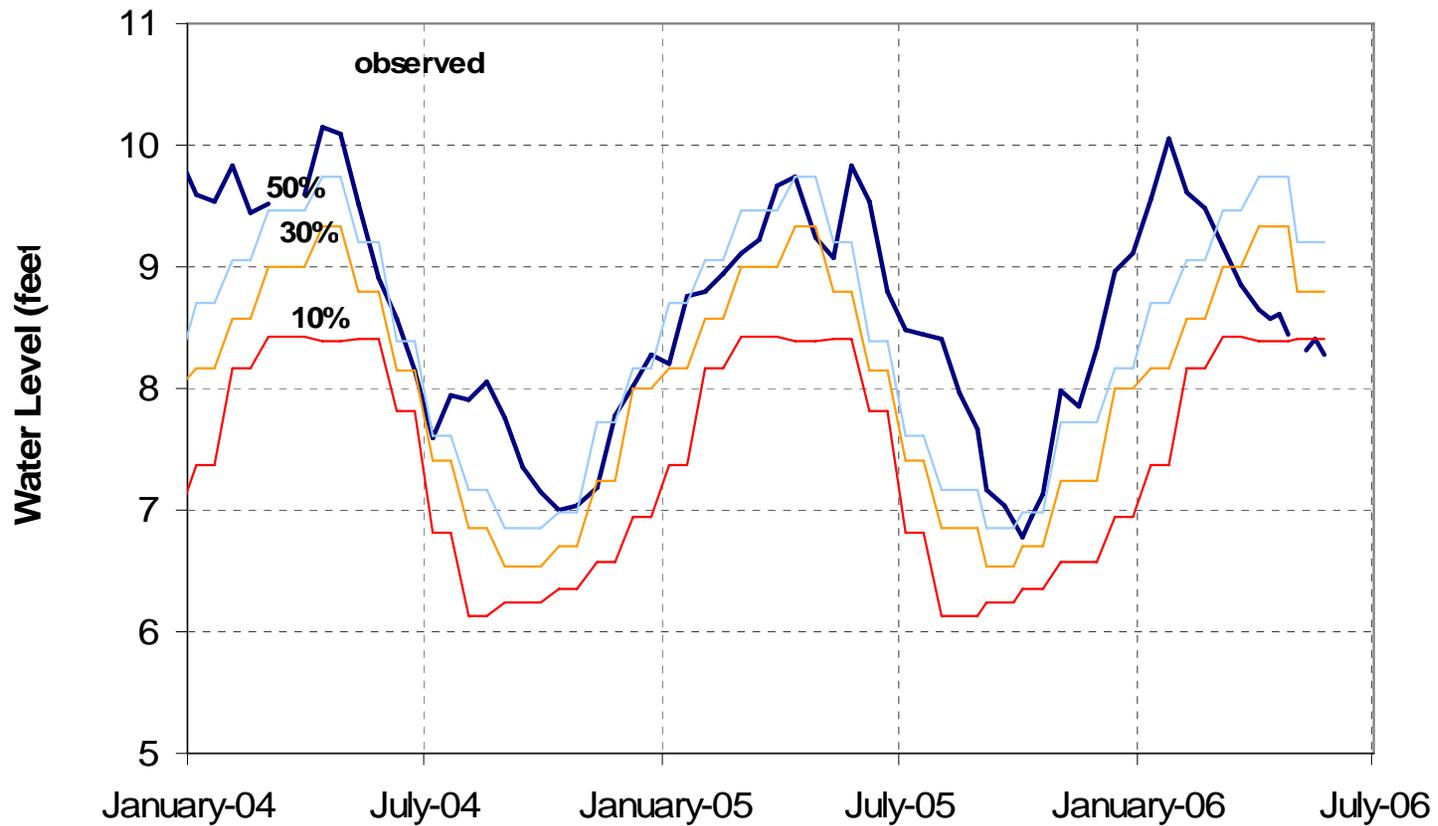
compare current storage to rule curve.



# Ground-water

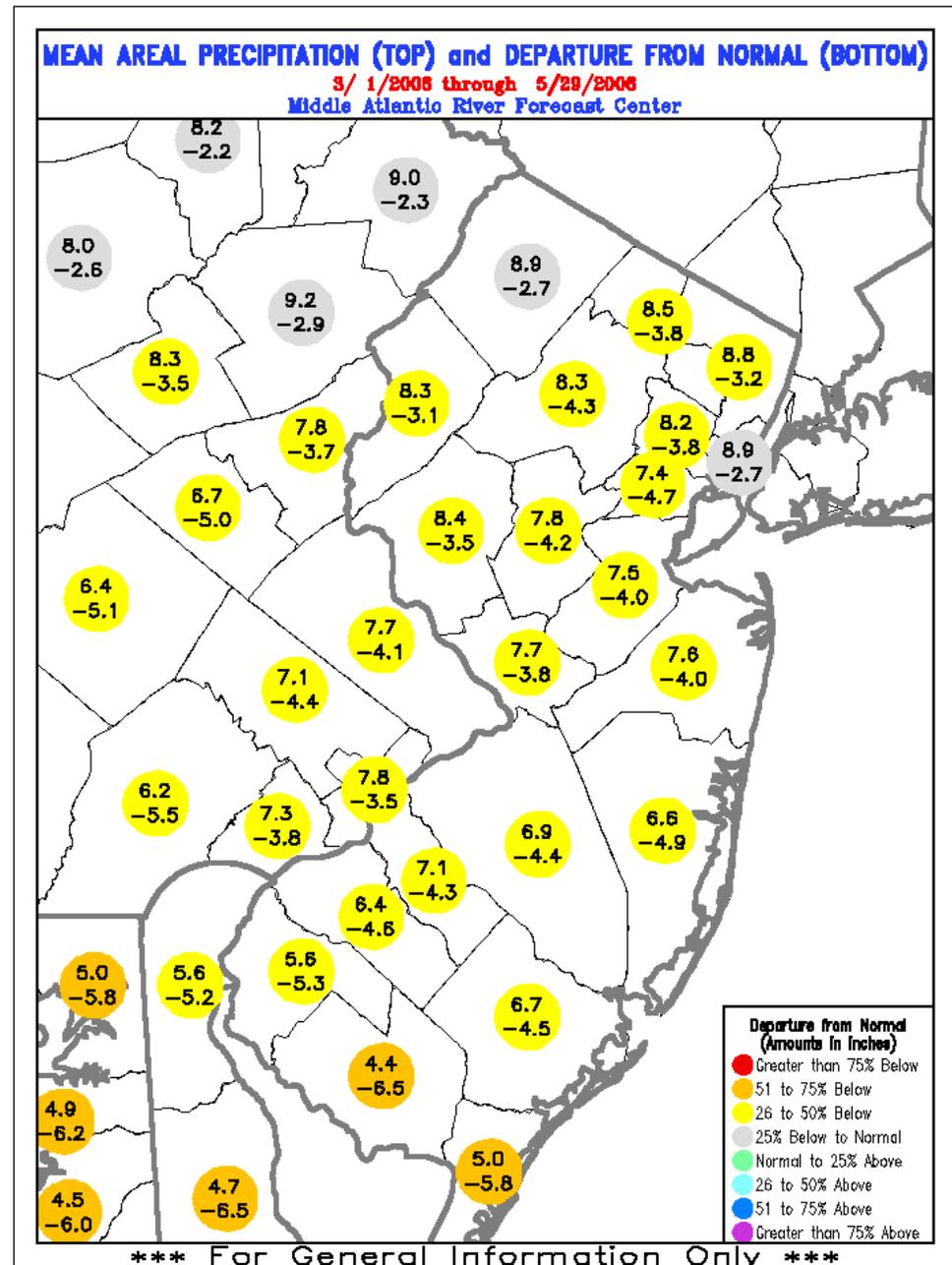
## Compare current level to normal.

### Pump Pond obs well



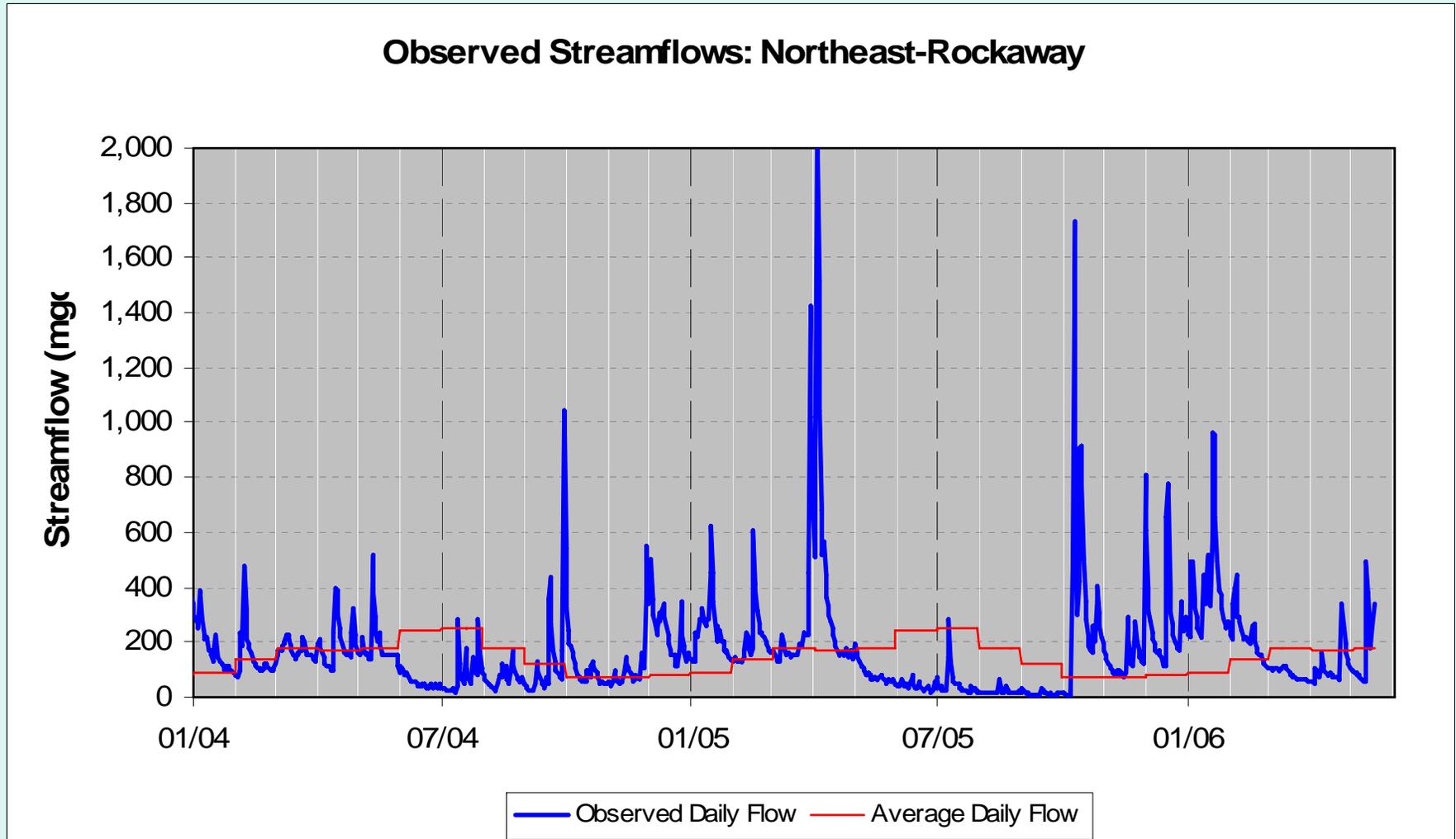
# Precipitation

Compare 90-day surplus/deficit to normal.



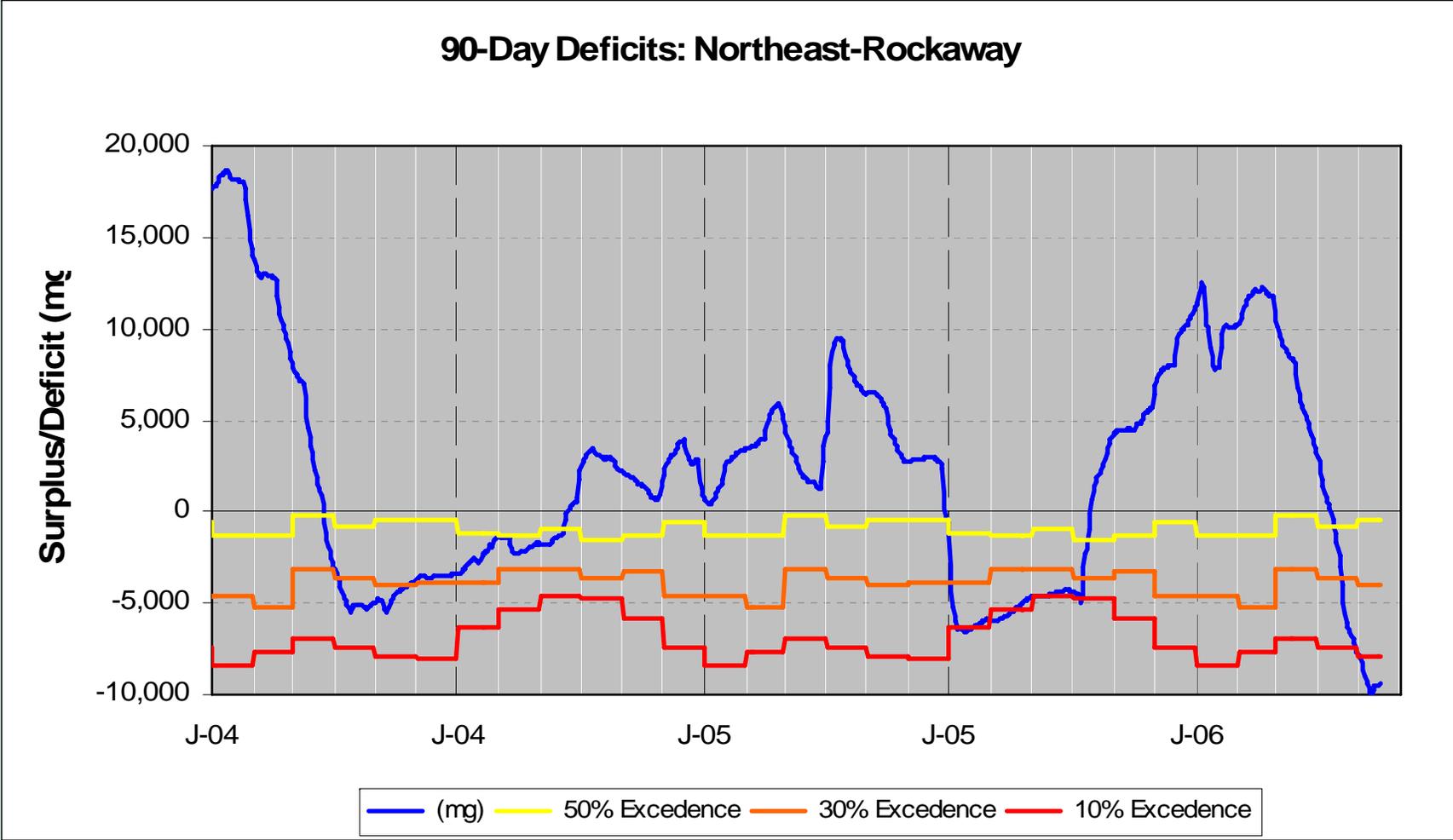
# Streamflow

Instantaneous flows not well correlated with droughts.



# Streamflows

Compare 90-day deficits to normal.



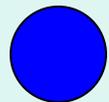
# Evaluate indicators in each region

Region	Indicator Status	Hydrologic Indicator				
		90-day precipitation	90-day stream flow	NJ res.	Del R. res.	Unconf. ground water
Northwest	Near or above normal			Not a significant water source to the region		
	Moderately dry					
	Severely dry					
	Extremely dry					

[www.njdrought.org](http://www.njdrought.org)

# Relative Resource Importance to NJ Water Supply

Drought Region	Reservoirs		Rivers	Unconfined Ground Water
	NJ	DRBC		
Northwest	○	○	●	●
Central	●	●	●	○
Northeast	●	○	●	○
Southwest	○	●	○	●
Coastal North	●	○	○	●
Coastal South	○	○	○	●



:Major Source



:Minor Source



:Not a Regional Source

# What is a Drought?

There are 4 different types of droughts.



# Agricultural Drought

evapotranspiration > precipitation  
at a time when plants need water.



# Hydrologic Drought

Reservoirs, streamflows & ground-water levels are lower than normal for longer than normal.



# Socioeconomic Drought

“... a water supply shortage of a dimension which endangers the public health, safety, or welfare in all or any part of the State...

N.J.S.A. 58:1A-4.a.

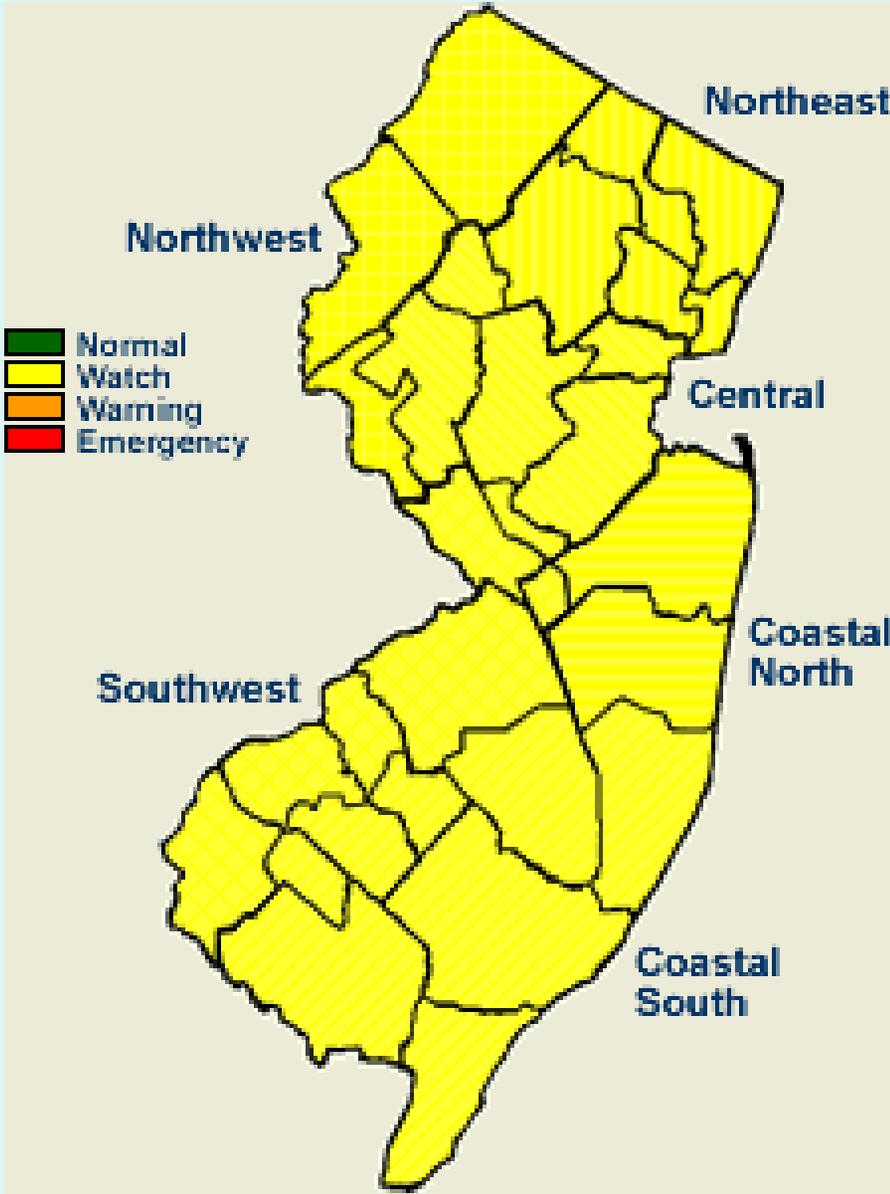


# Drought

- DEP staff look at hydrologic indicators and make a recommendation.
- DEP Commissioner declares watch & emergency.
- The Governor declares a drought emergency.
- This is a socioeconomic drought.

# Declared Drought Status

May 31, 2006



## 2001 vs 2005

2001

Entered drought watch  
10/31/01

Entered drought warning  
1/24/02 in 5 drought  
regions.

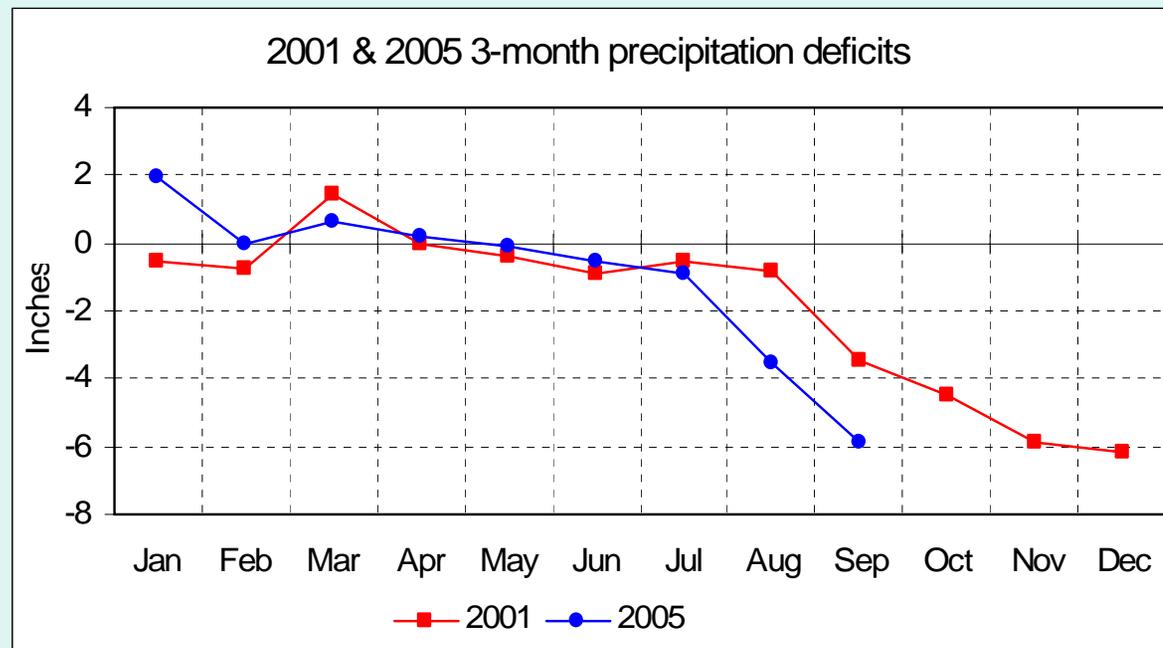
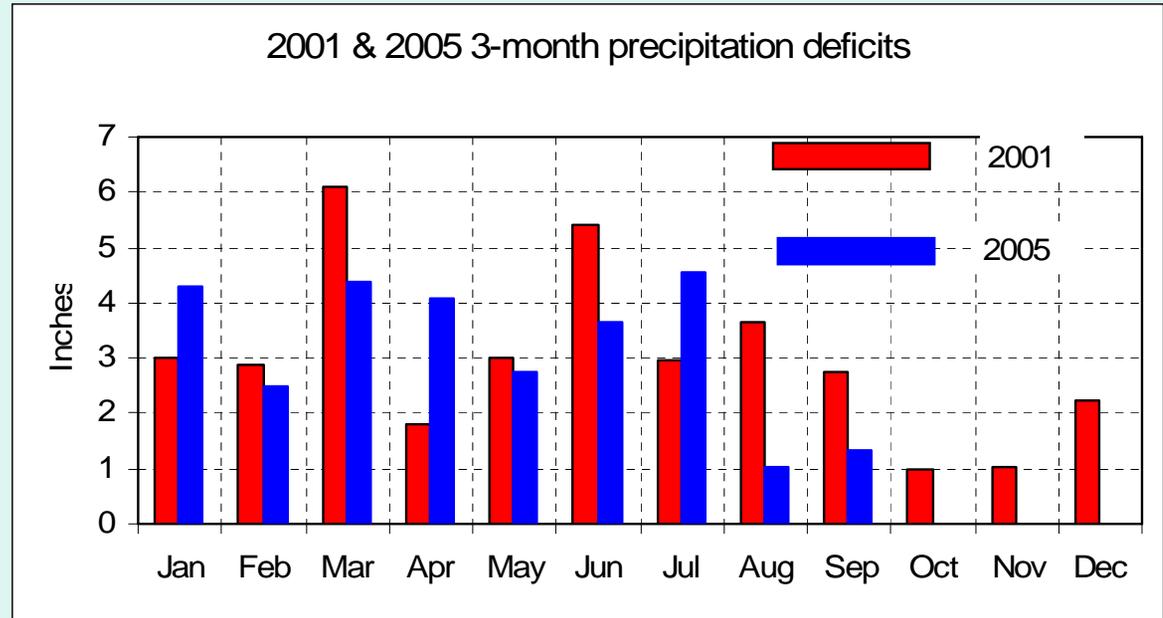
Entered drought  
emergency on 3/4/02 for  
all of state.

Remained in drought  
emergency until 1/8/03.

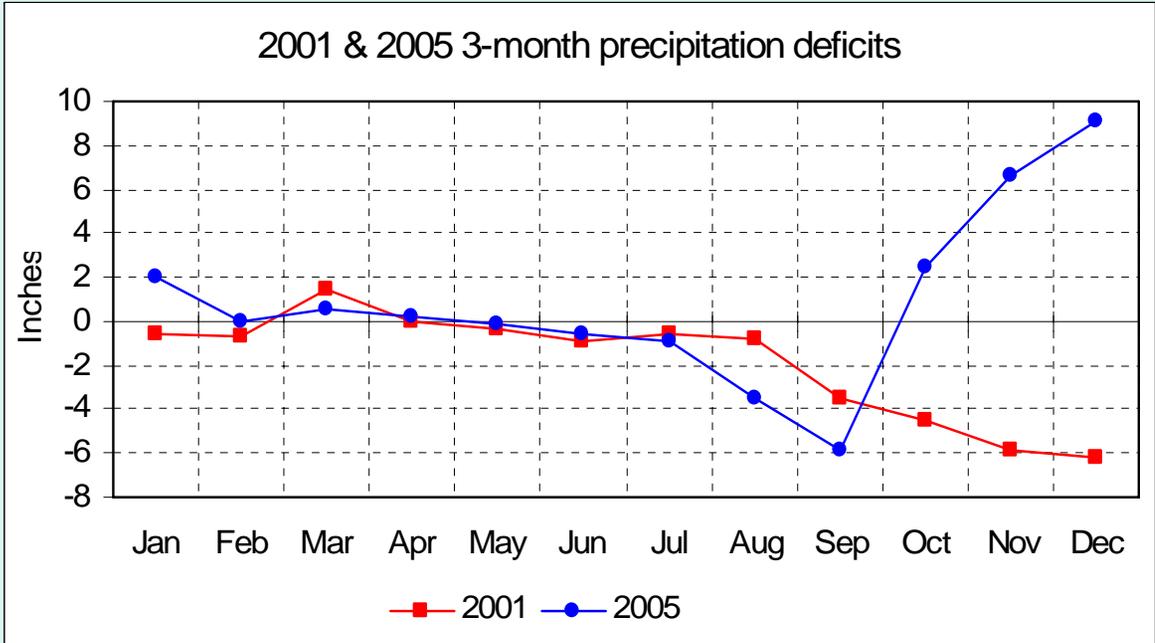
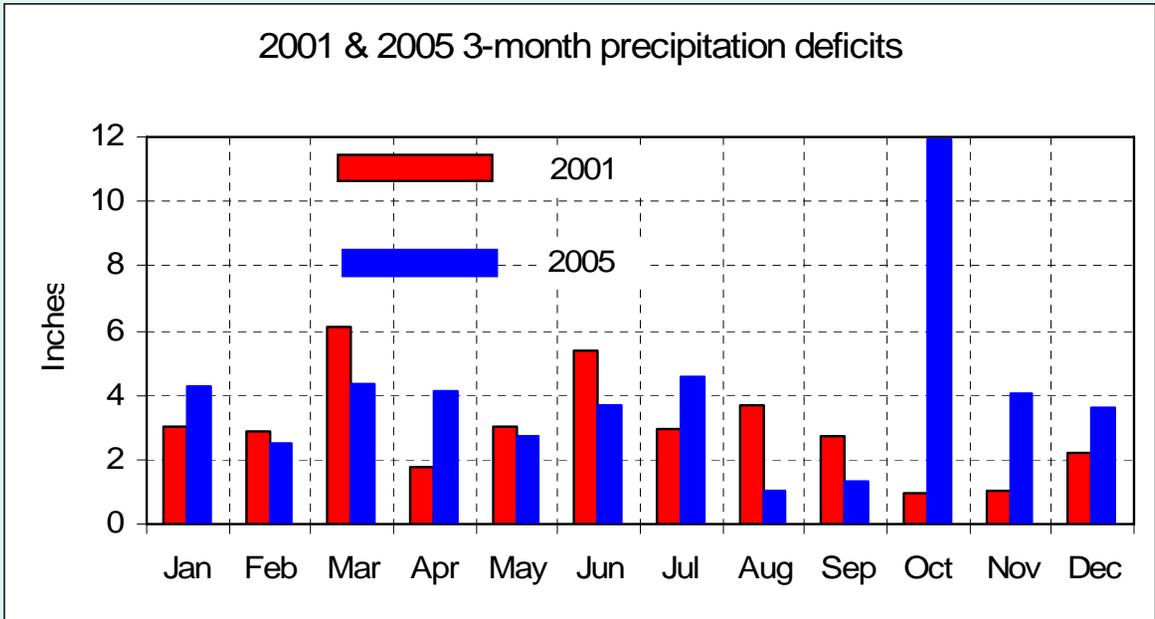
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2005

Entered drought watch  
9/14/05



In 2005 it rained!  
Drought watch lifted on  
10/19/05



# Drought Monitoring is always behind the curve.

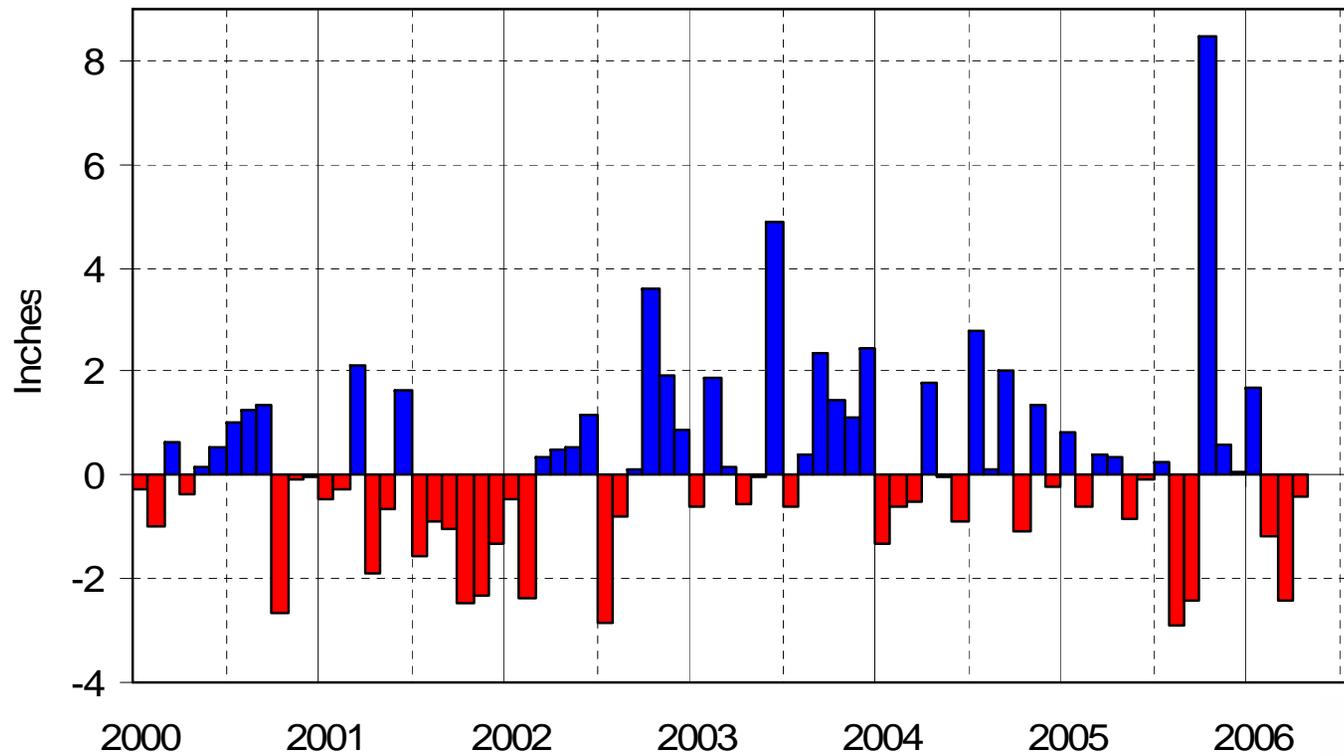
“We welcome the first clear day after a rainy spell. Rainless days continue for a time and we are pleased to have a long spell of such fine weather. It keeps on and we are a little worried. A few days more and we are really in trouble. The first rainless day in a spell of fine weather contributes as much to the drought as the last, but no one knows how serious it will be until the last dry day is gone and the rains have come again.”

I.R. Tannehill, *Drought: Its Causes and Effects*,  
Princeton University Press, Princeton, New Jersey, 1947

# Drought Planning

- In order to protect the water supply you have to assume that today starts a repeat of the worst drought on record.
- Can't assume it's going to rain soon.
- Always conserve water.
- Note – current drought status due totally to meteorological & hydrological situation, not due to a water supply problem.

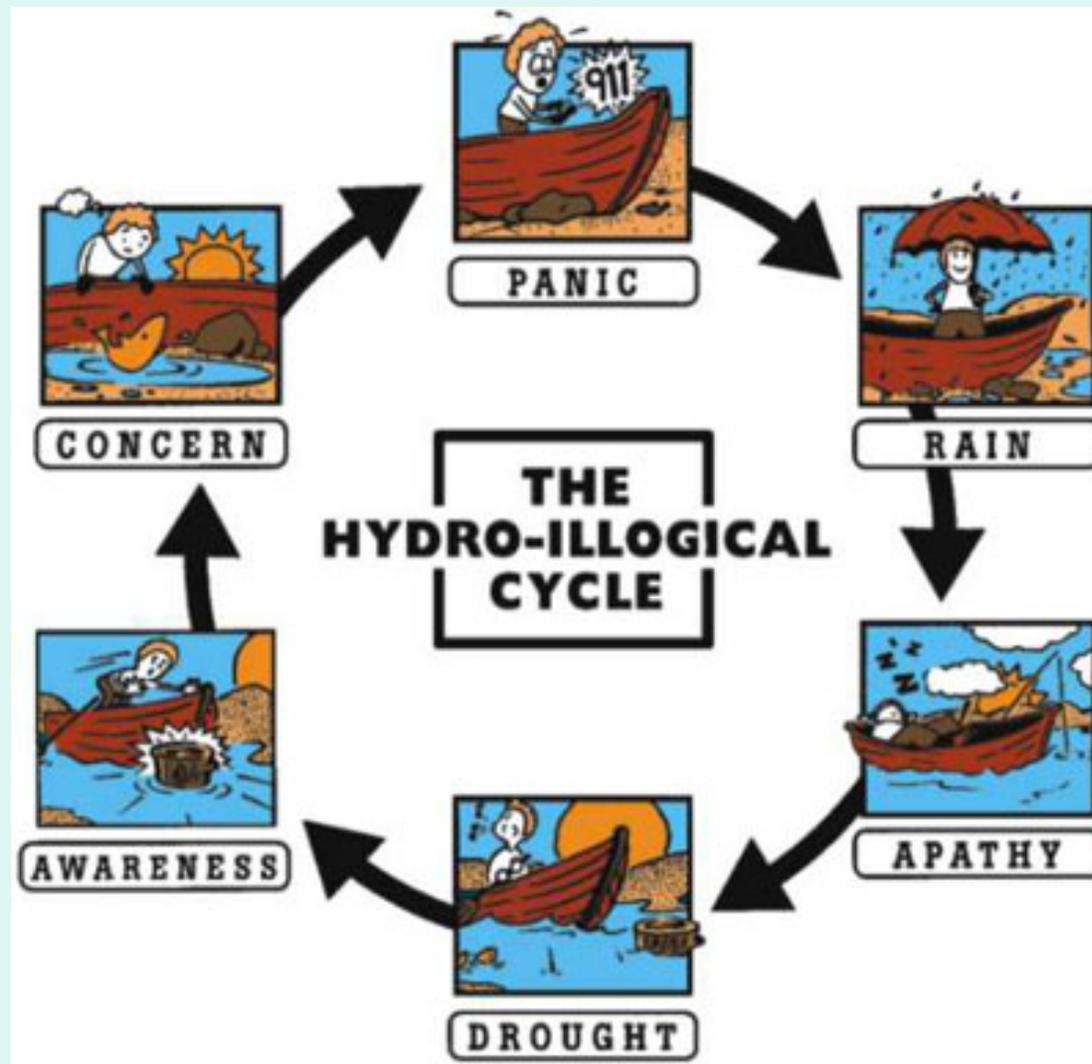
## State-Wide Precipitation Surplus/Deficit



What's Next?







<b>Watch</b>	<b>Warnings</b>	<b>Emergencies</b>	<b>Comment</b>
--	mid-1960's	mid-1960's	Drought of record for NJ
--	8/80 - 9/12/80	9/12/80 - 4/27/82	Started in northeastern NJ and expanded to central and northern Delaware basin
--		4/17/85 - 3/24/86	Northeastern NJ
--	8/2/95-9/12/95	9/13/95 - 11/3/95	Northeastern NJ
--	12/14/98 - 2/2/99	--	Northeastern NJ (ended by record rains in Jan '99)
--	8/2/99 - 8/4/99	8/5/99 - 9/14/99 8/5/99 - 9/27/99	Southern NJ Northern NJ (Hurricane Floyd, Sept '99)
--	9/15/99-7/17/00 9/28/99-7/17/00	--	Southern NJ Northern NJ
10/31/01-3/21/03	1/24/02 – 3/21/03	3/4/02 – 3/21/03	Some regions entered and left drought status slightly earlier.
9/14/05 - 10/19/05	--	--	Entire state (Record rains, Oct '05)
5/8/06 -			Entire State