Competing needs for water
Ag, Urban, ecology

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GEOSCIENCE & ENGINEERING SOLUTIONS

A Framework for Regional Water Supply Planning in Indiana

"Overall, small utilities continue to have more planning and financial management challenges, and these challenges need to be addressed. While the responses also indicate that Indiana's water utilities are able to meet customer demand at this time, there continues to be a lack of planning for drought. In addition, most utilities have made no provision for obtaining additional water supplies, should demand significantly increase or an emergency occur."

IURC Water Utilities Resource Report, 2014

A Framework for Regional Water Supply Planning in Indiana

"Centralized management and additional Full-Time Equivalents are needed in water agencies. The **work needs to be coordinated** to direct attention to the most pressing problems and move towards solutions."

"Previous studies have confirmed the **uncertainty of water resource limits** on water supply. The state needs to forecast future demand for water and map availability of supply in order to avoid conflict and promote sustainable infrastructure."

Evaluation of Indiana's Water Utilities: an analysis of the State's aging infrastructure, 2016

Recent Statutory Guidance

"The IFA shall monitor and study events and conditions that bear upon the ability of utilities to provide clean and safe drinking water in Indiana for the foreseeable future including the ability of utilities to directly or indirectly fund the increasing costs of meeting governmental requirements"

Senate Enrolled Act 416

What is changing?

- Growing metro areas.
- More users pumping more water.
- Planning at the scale of the resource is limited.
- Water quality is a piece of the puzzle.
- Surface water is more variable (flow and quality) than groundwater.
- Peak municipal use is growing while per capita use is shrinking.
- Increase in row crop irrigation on farms adds land value.
- Sparce, infrequent water level and groundwater quality data on aquifers.

Why plan?

Economics (jobs) and quality of life (jobs and happiness)

- Economic Development depends on a reliable supply of water and Indiana depends more than any other state on abundant supplies (Rosaen, 2014).

- Quality of life is enhanced by a healthy environment. This is a multi-million dollar asset that deserves protection.

Why plan?

We are competing with every country in the world for business.

If Indiana wants to add manufacturing, increase agricultural productivity and be an attractive place to live, we need to know our priority basins and our priority uses of water.

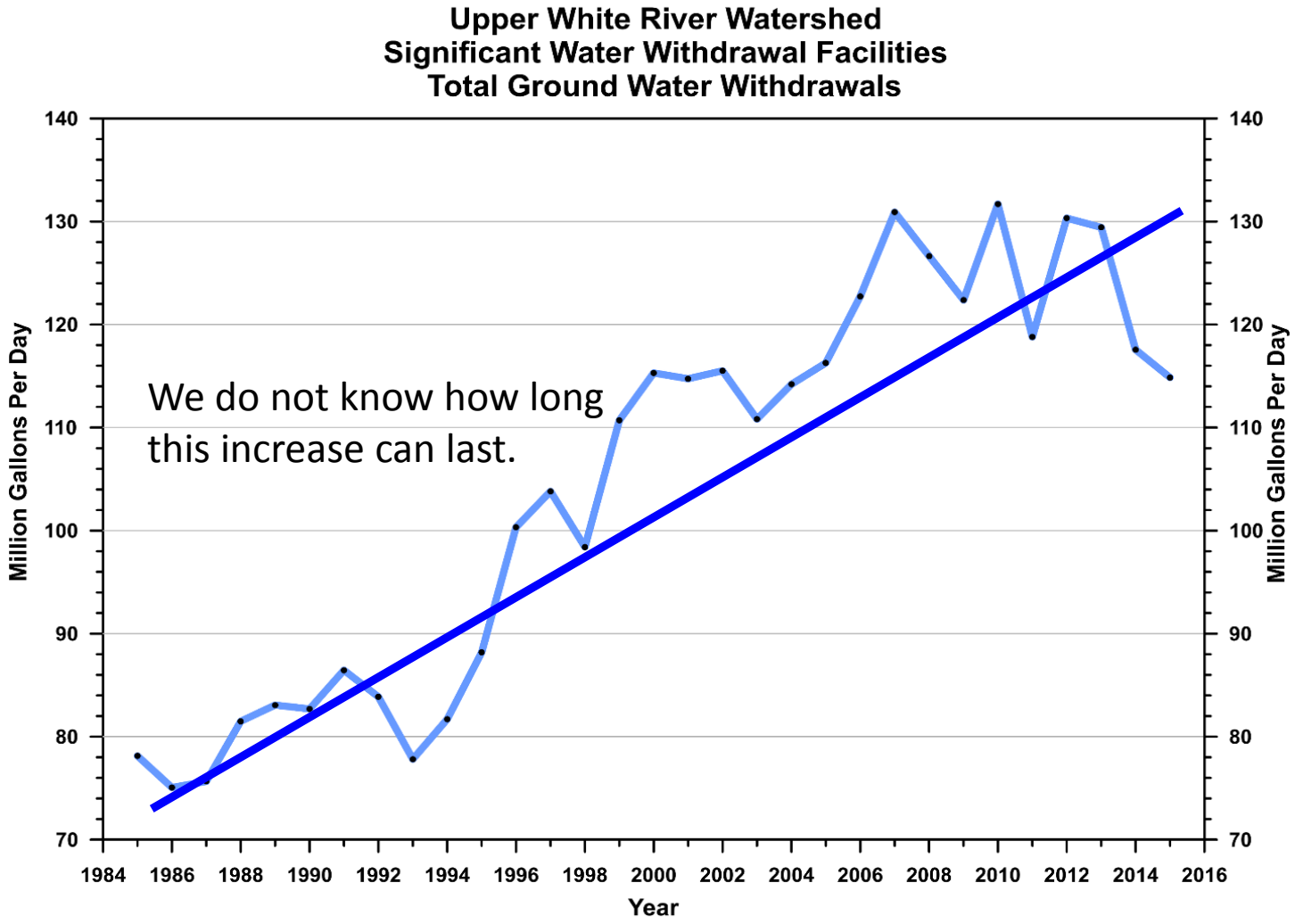
We are leaving money on the table.

The Army Corps of Engineers would like to help but we don’t have any insight into where to plug in their support.

Why plan?

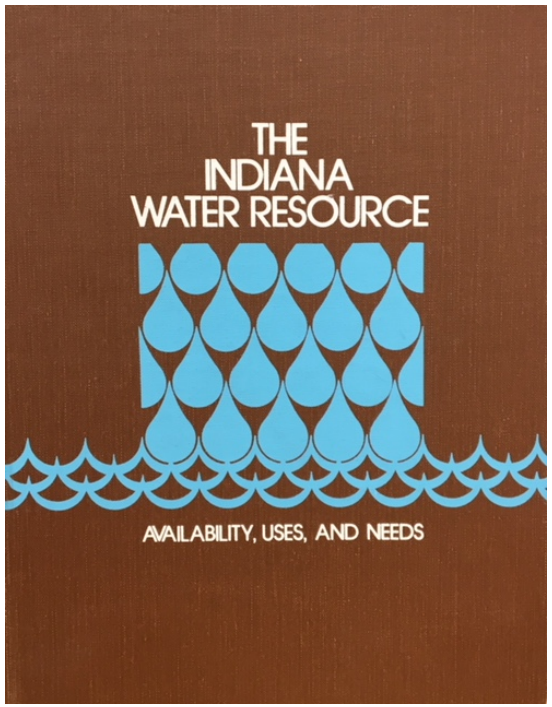
Changing water use

- **Increases in groundwater**
- **Decreases in surface water use**

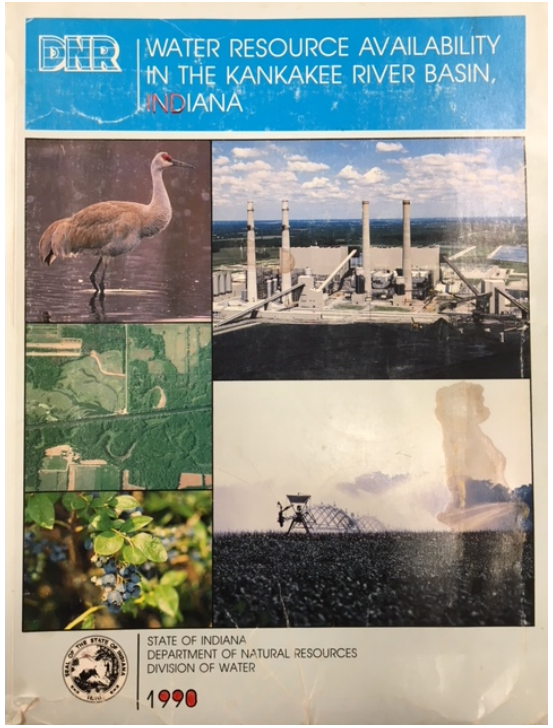


History of Water Planning in Indiana

1980 DNR produced the first "modern" assessment of water availability (Clark, 1980).



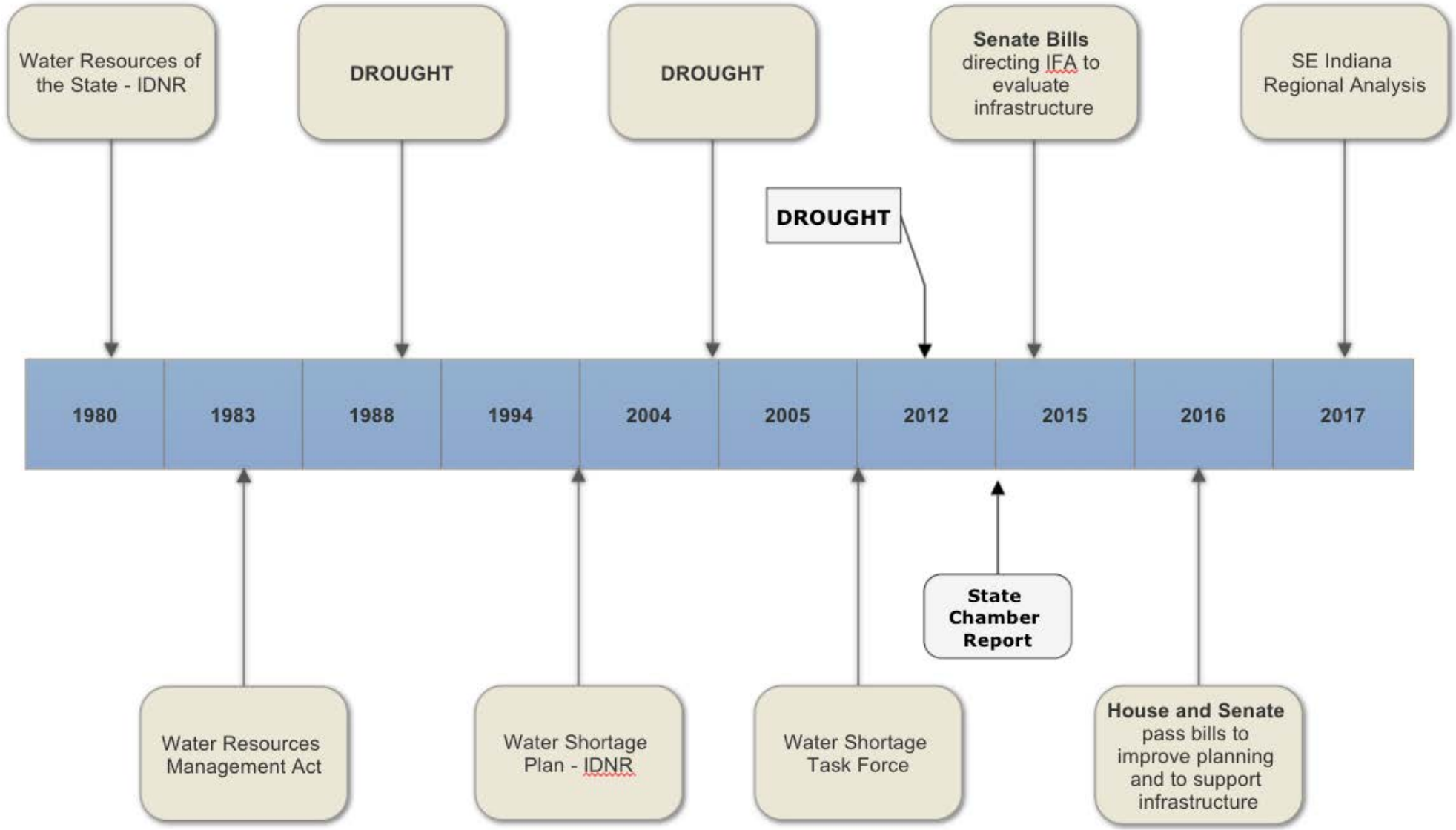
1990s DNR produced several "basin assessments"



Water Resources Management Act of 1983

The Water Resources Management Act outlined a plan for 5-year cycles of water resource planning at local, regional, and state levels.

- The Act defined water resources planning (water available compared to anticipated need) and added this to the portfolio of the Natural Resources Commission. Funding reduced in the 1990s. Regional or statewide planning never occurred.
- Several Basin Studies were implemented within the Division of Water at DNR but the lack of digital tools doomed the regional analysis.
- Set a price on water at $33/million gallons


Water Resources of the State - IDNR
DROUGHT
DROUGHT
DROUGHT
Senate Bills directing IFA to evaluate infrastructure
SE Indiana Regional Analysis
1980
1983
1988
1994
2004
2005
2012
2015
2016
2017
Water Resources Management Act
Water Shortage Plan - IDNR
Water Shortage Task Force
State Chamber Report
House and Senate pass bills to improve planning and to support infrastructure

Consensus Recommendations

- **Regional** planning is the next step forward.
  - Regions need to be identified.
  - Indiana needs to forecast future demand and estimate water availability in hydrologic regions.
- **Data** and models needed.
  - This supports regional planning and local management.
  - State can generate data to help regions manage their water resources.
- **Basins** need to be identified for analysis.
  - Pilot studies can be used to consider methods, drought response priorities and coordination with feds.

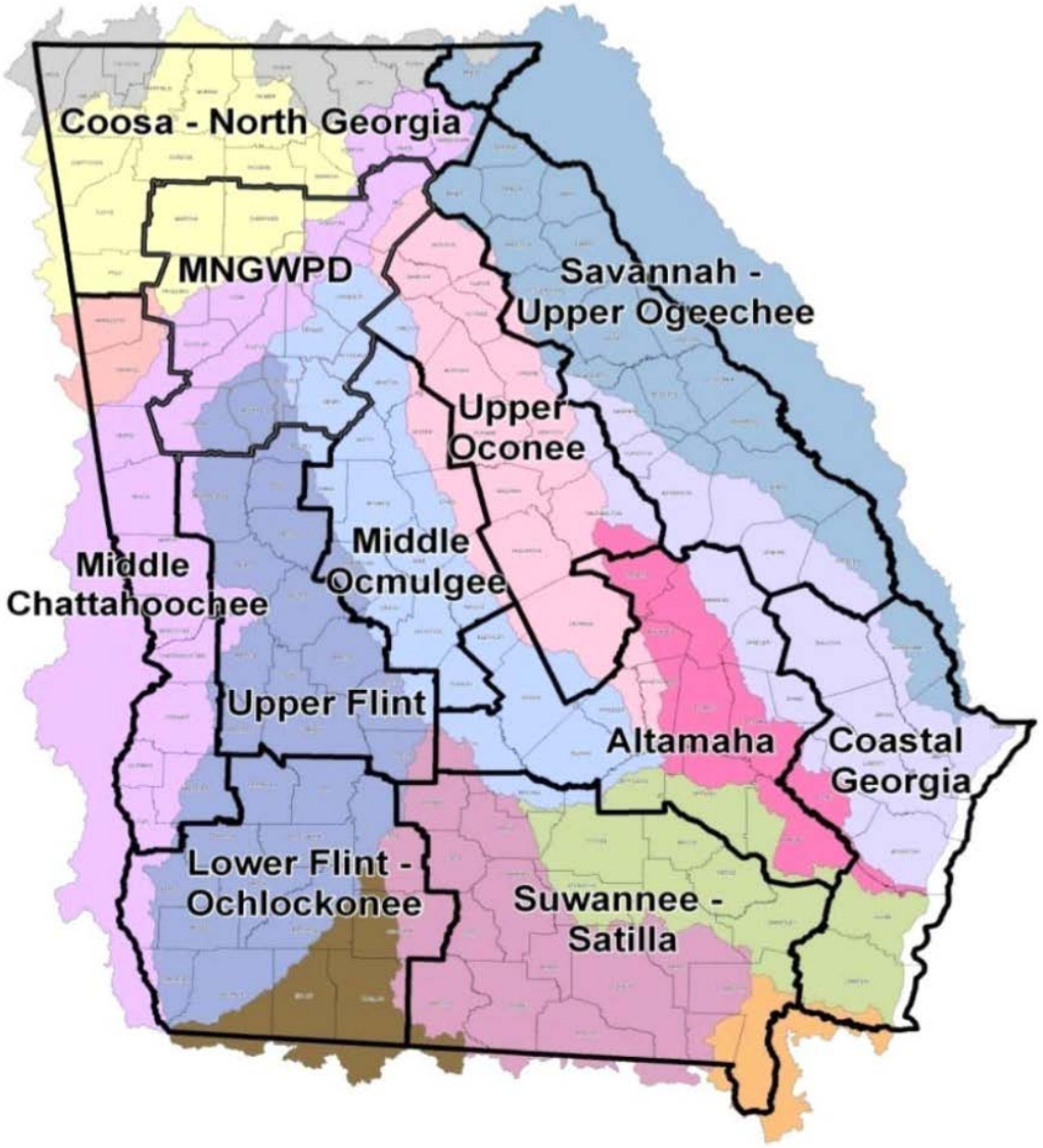
Why regional planning?

Drought occurs at a regional scale.

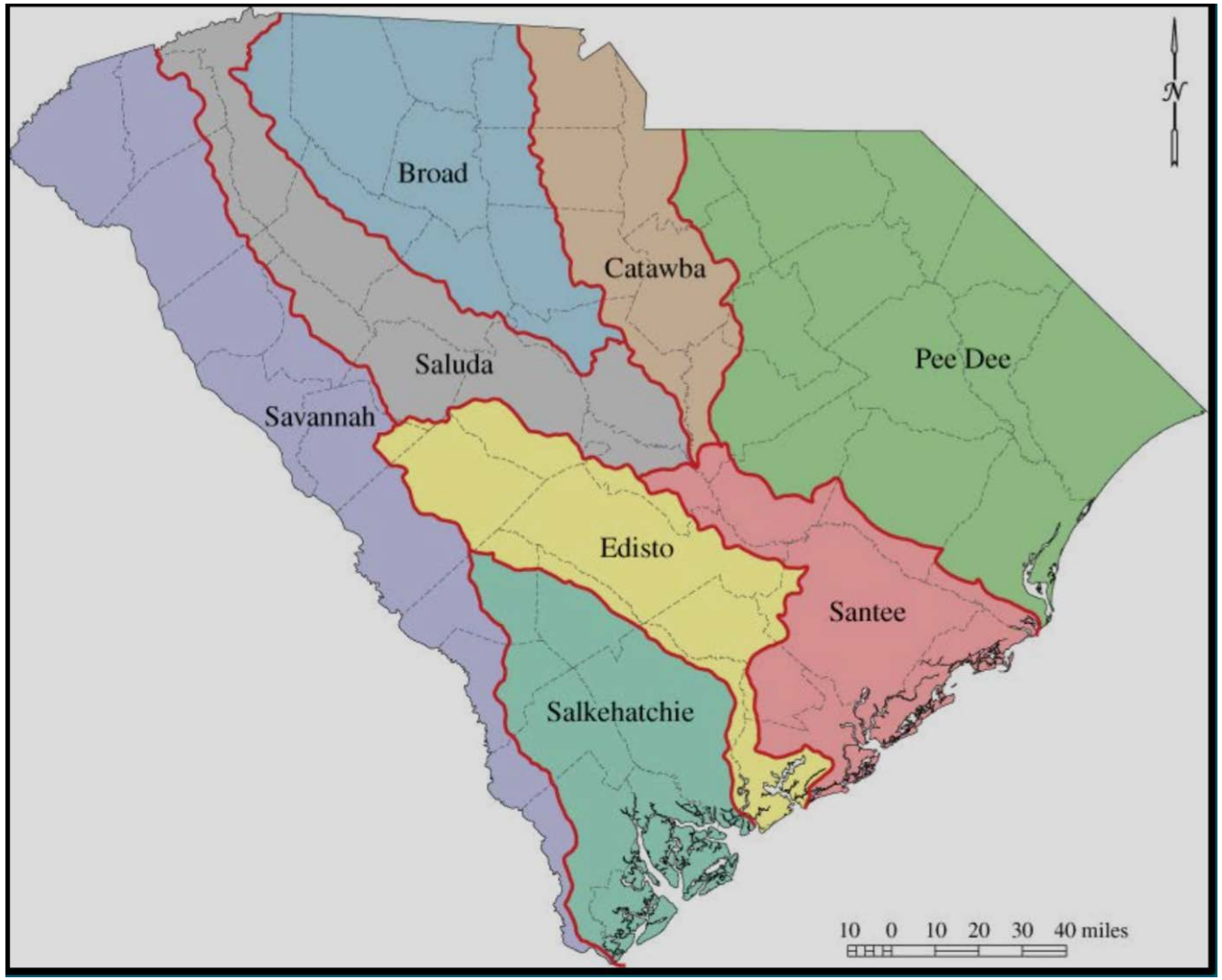
Local water availability, sources of water, water use, and the degree to which groundwater is used vary across the State.

Because regions of the State have different sources and uses of water, plans are more effective if tailored to each region's specific resources and needs.

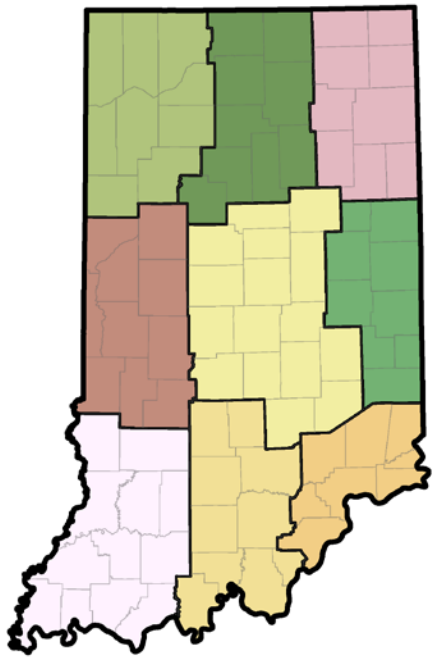
Georgia Planning Regions



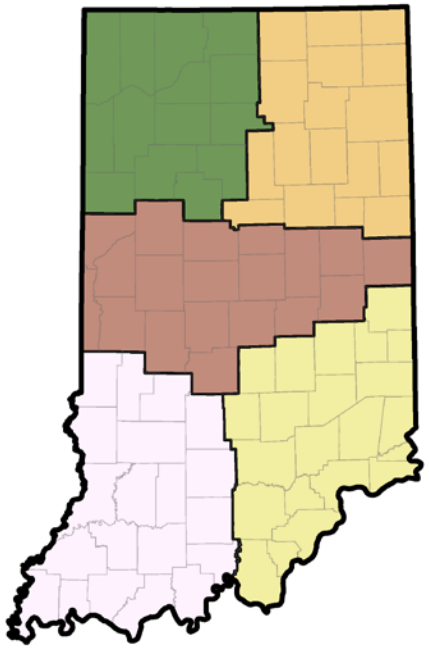
Proposed South Carolina Planning Regions



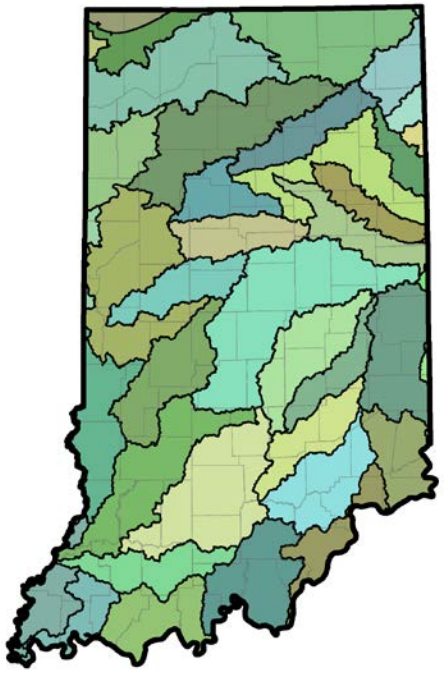
Many options for Indiana Regions



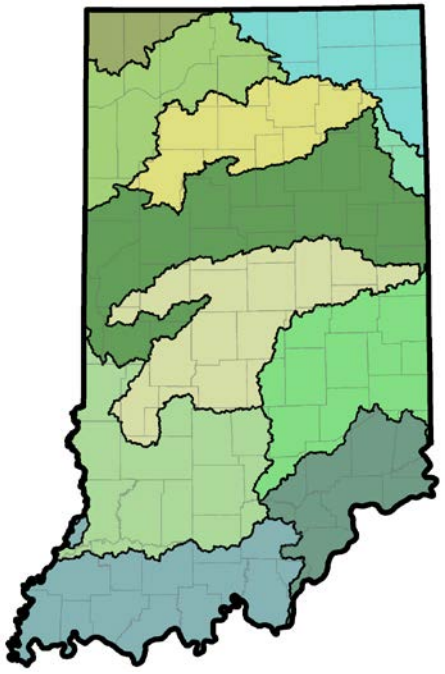
a) Climatic regions



b) Indiana AWWA districts



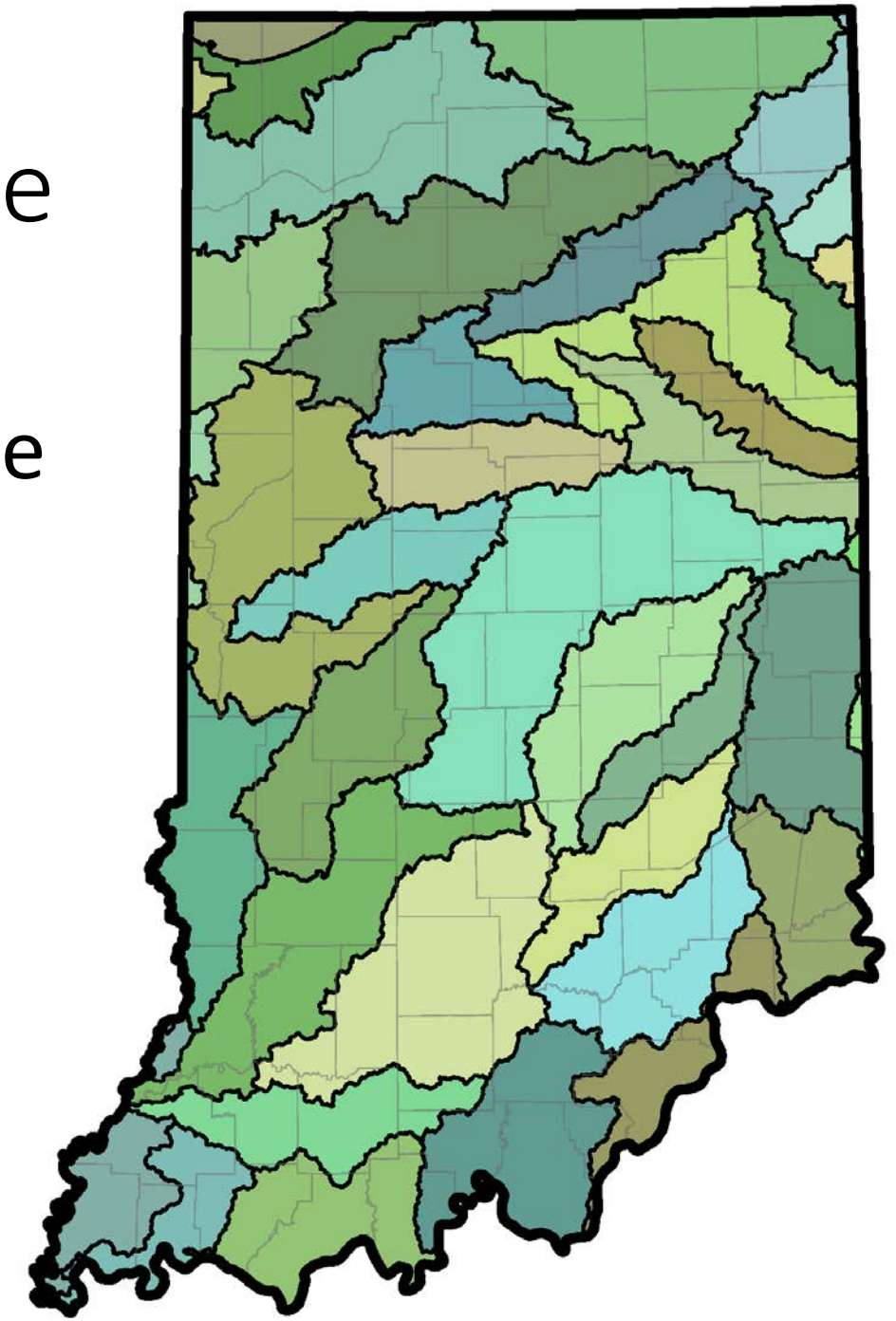
c) Watersheds



d) Combined watersheds

Watersheds scale makes sense

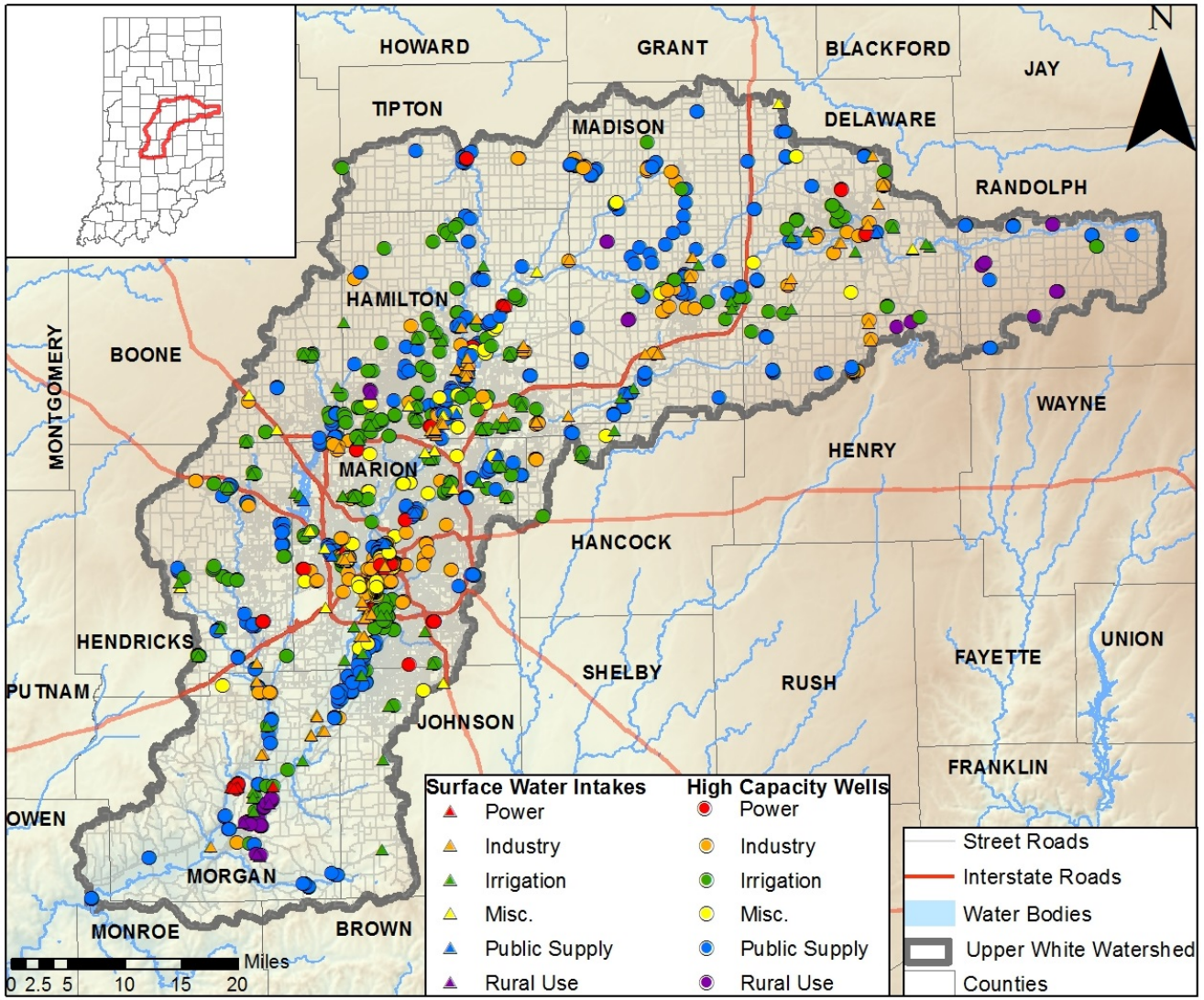
- Grouping watersheds would be practical
  - Water availability
  - Demand forecasts
- Sustainability / adequate supply evaluation
- Water shortage investigations



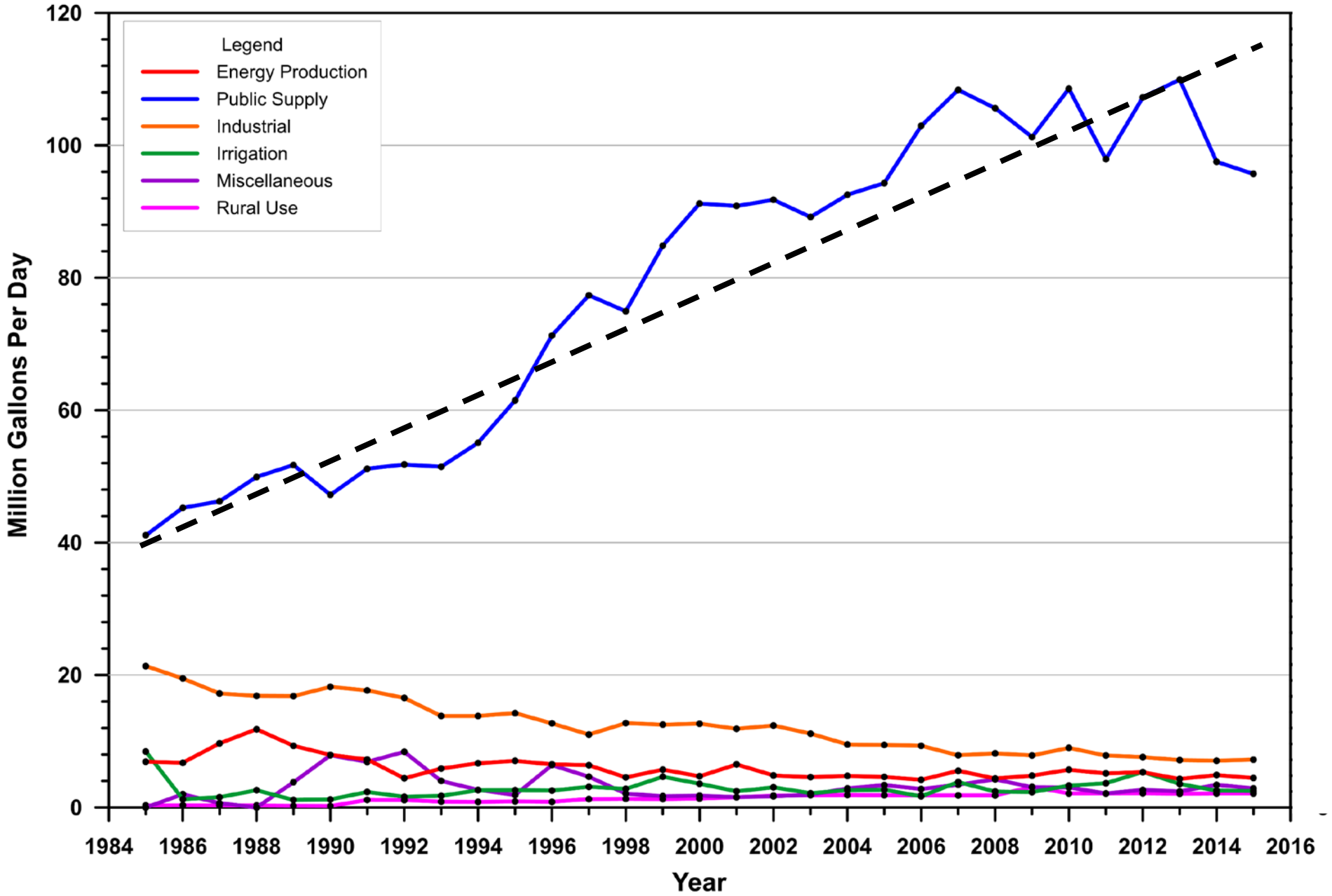
As more people move to Central Indiana, water supply needs have increased.

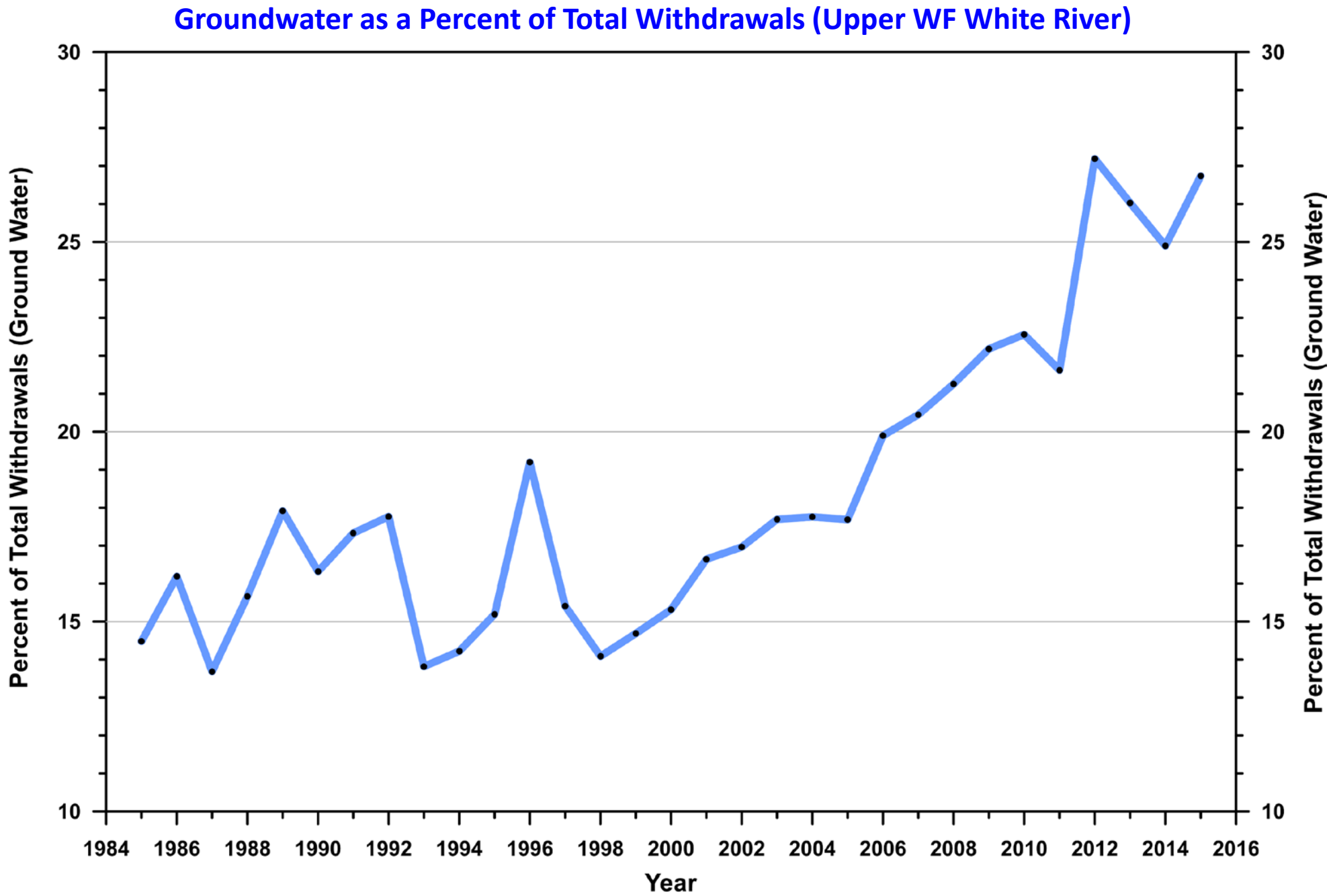
To grow the regional economy, we need to be ready for the future.

Upper White Fork – Potential Pilot Basin



Groundwater Withdrawals by Use (Upper West Fork White River)




Groundwater as a Percent of Total Withdrawals (Upper WF White River)
Percent of Total Withdrawals (Ground Water)
Percent of Total Withdrawals (Ground Water)
30
25
20
15
10
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year

Why start with this basin?

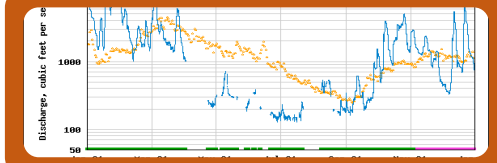
- Supplies are shifting with metro demographics.
- Local competition is inefficient. Regional systems could help.
- Regional decisions and growth affect options.
- The increase in groundwater use is driven by growth in PWS use.
- Groundwater use is increasing and we need to manage this asset.
- Is it always wise to plan.

- 18 months to generate the models and the forecasts.
- Convene the conversation among regional stakeholders.

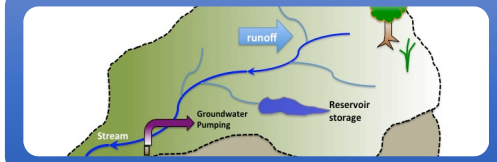
State Water Plans address these areas:

- **Science**
  - Evidence and data
  - Understandable regions
  - Present /projected demands
  - Quantity / quality of water
- **Control**
  - Residents need information
  - Reflect regional and local priorities
  - Multiple jurisdictions
  - Communicate and implement
- **Principles**
  - Balance
  - Economic effects
  - Health and safety
  - Environmental needs
- **Policy**
  - Infrastructure
  - Conservation
  - Planning and Control
  - Regional Resliency

Value of State Water Planning



Platform for informed decision-making.



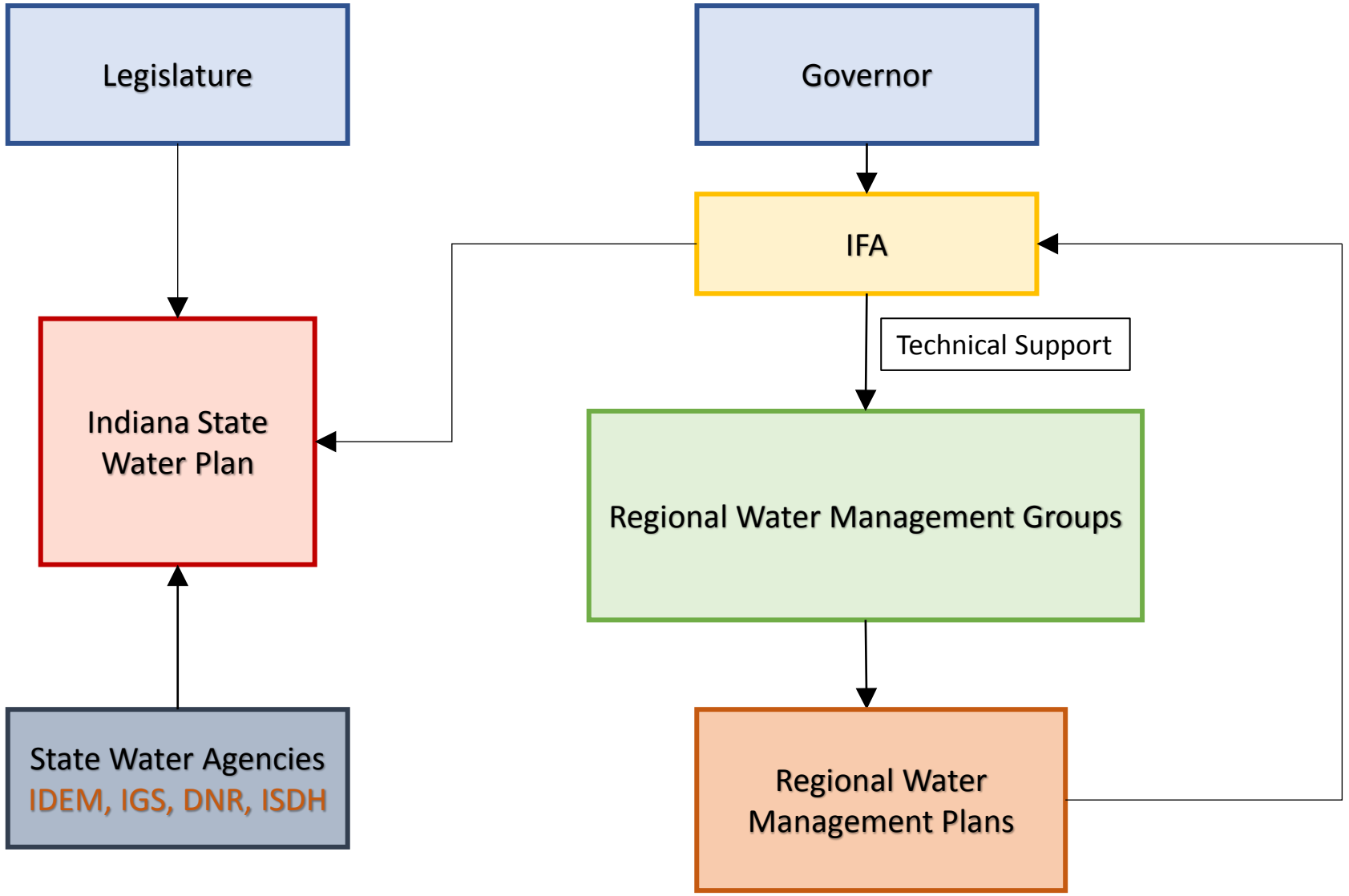
Define regional priorities

Protect water quality

Balance needs of users

Maintain high quality data and useful tools for regions

IFA – Water Division

- New division of the IFA would organize and oversee water programs and regions in the State
- Agencies would help regions with data collection and analysis
- Regions would develop their own Regional Water Supply Plan
- IFA would combine all regional plans in the Indiana State Water Plan

Regional Water Supply Planning