



***Congressional Research Service***

Assisting the Congress with its deliberations and legislative decisions

# **Three GIS Case Studies**

Jan Johansson

Paul Schirle

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## CRS in Brief

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CRS serves the Congress throughout the legislative process by providing comprehensive and reliable legislative research and analysis that are timely, objective, authoritative and confidential, thereby contributing to an informed national legislature.



# Importance of Accuracy

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*"...lives are at stake if errors of judgment occur or if data and analysis do not accurately predict actual outcomes."*

Daniel P. Mulhollan  
CRS Director  
Annual Address, 2009



## Sources and Collaboration

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For GIS data, CRS relies on the collections of

- Geography & Map Division of the Library of Congress
- Federal agencies
- State and local data managers
- Non-governmental organizations
- Commercial data providers



# GIS in Public Policy – Three Cases

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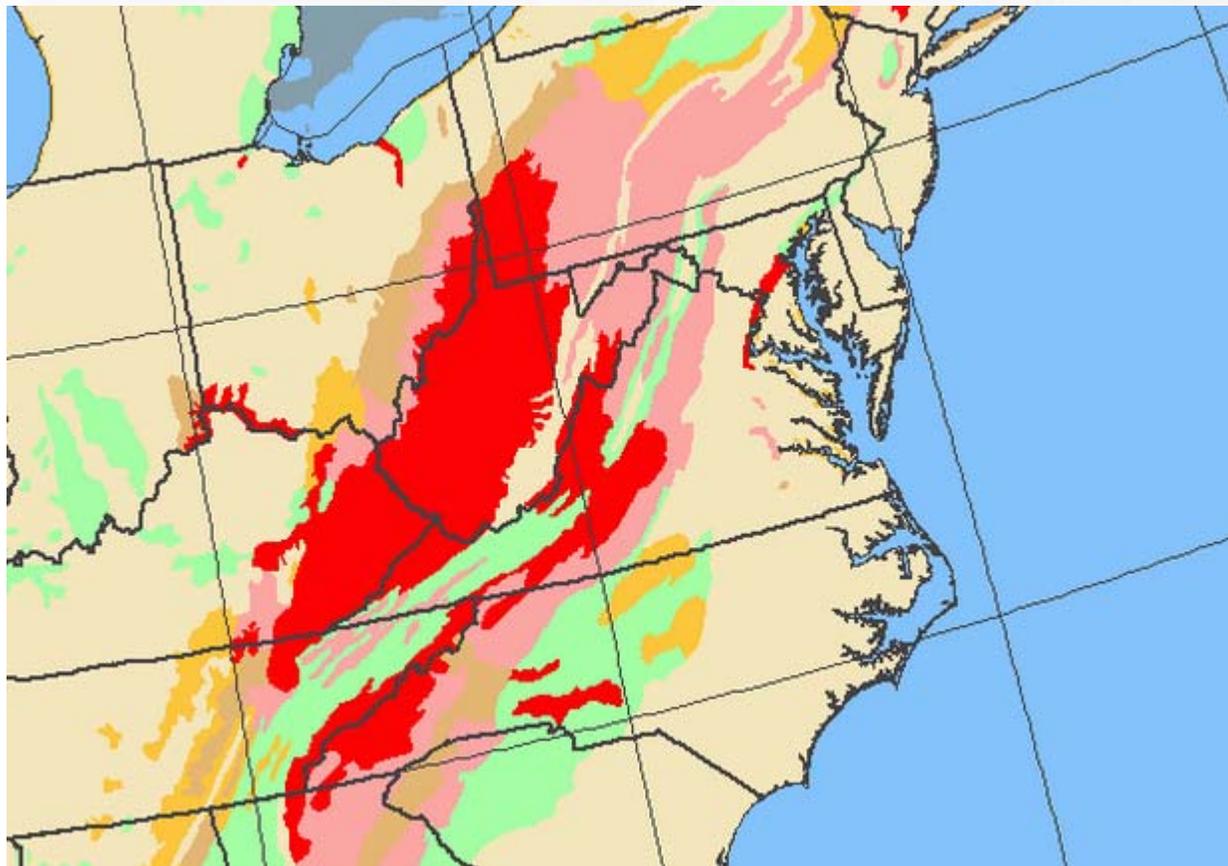
Because of our commitment to maintaining confidentiality, each case has been altered to protect the identity of the requestor

- Creating geospatial data from legislation
- Analyzing relationship between poverty and carbon emissions controls
- Exploring policy issues related to California water management



# Creating Geospatial Data From Legislation

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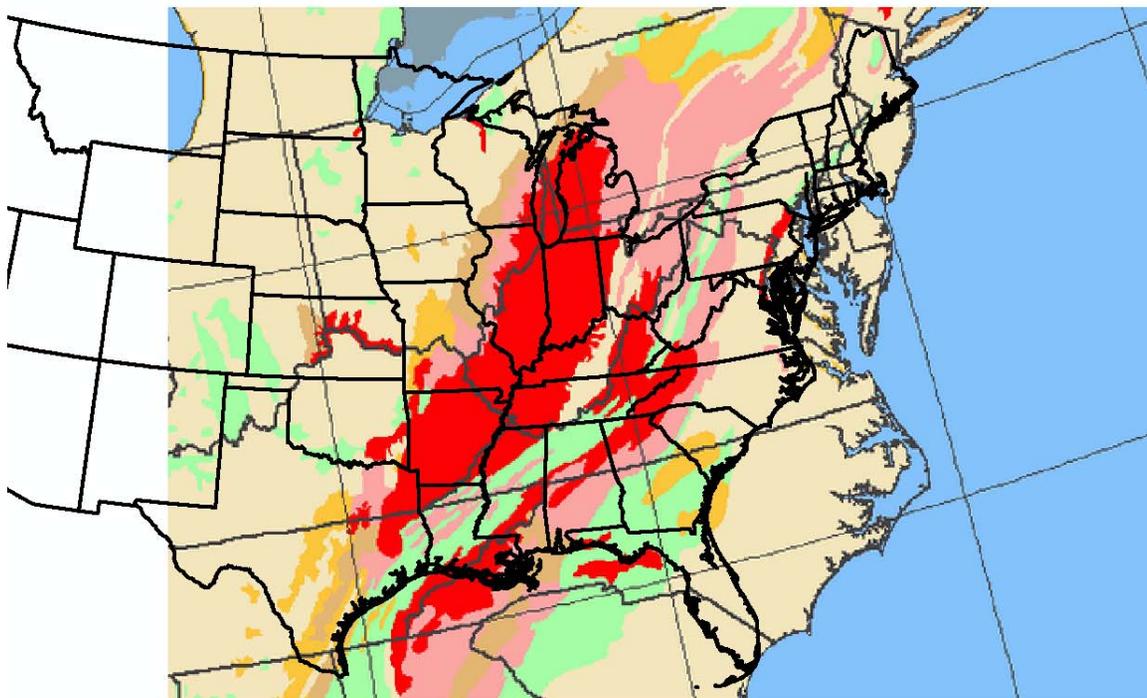
# Extraction

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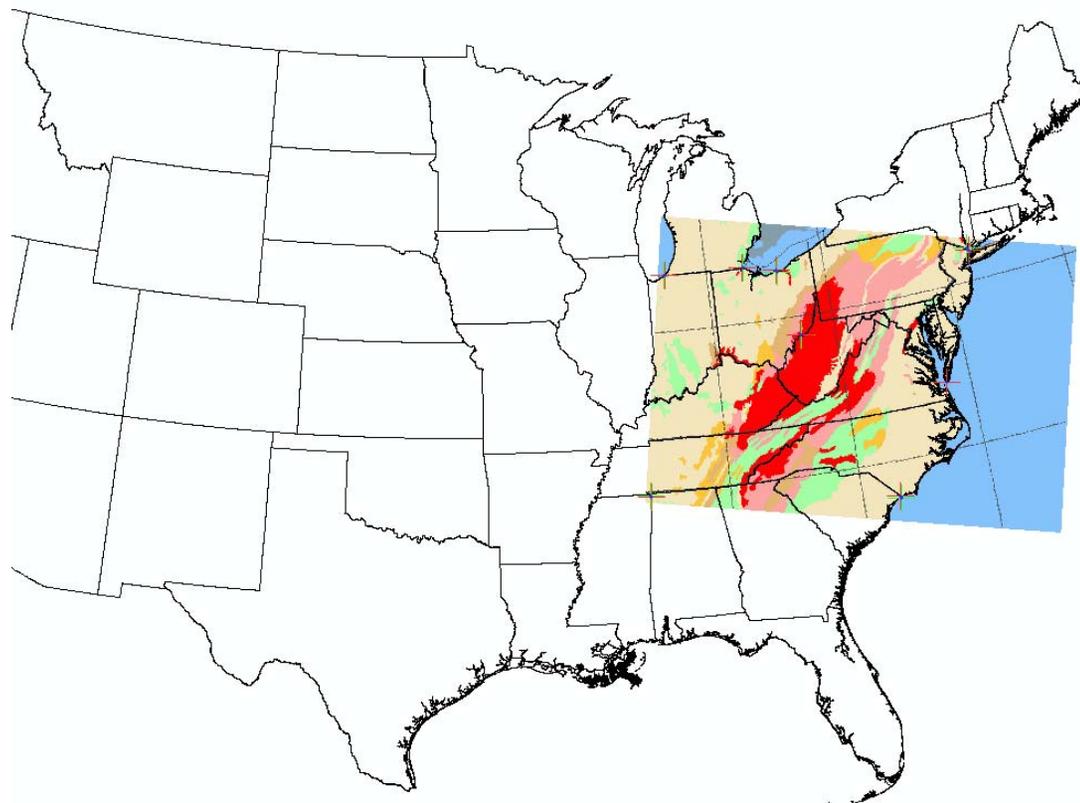
# Overlay

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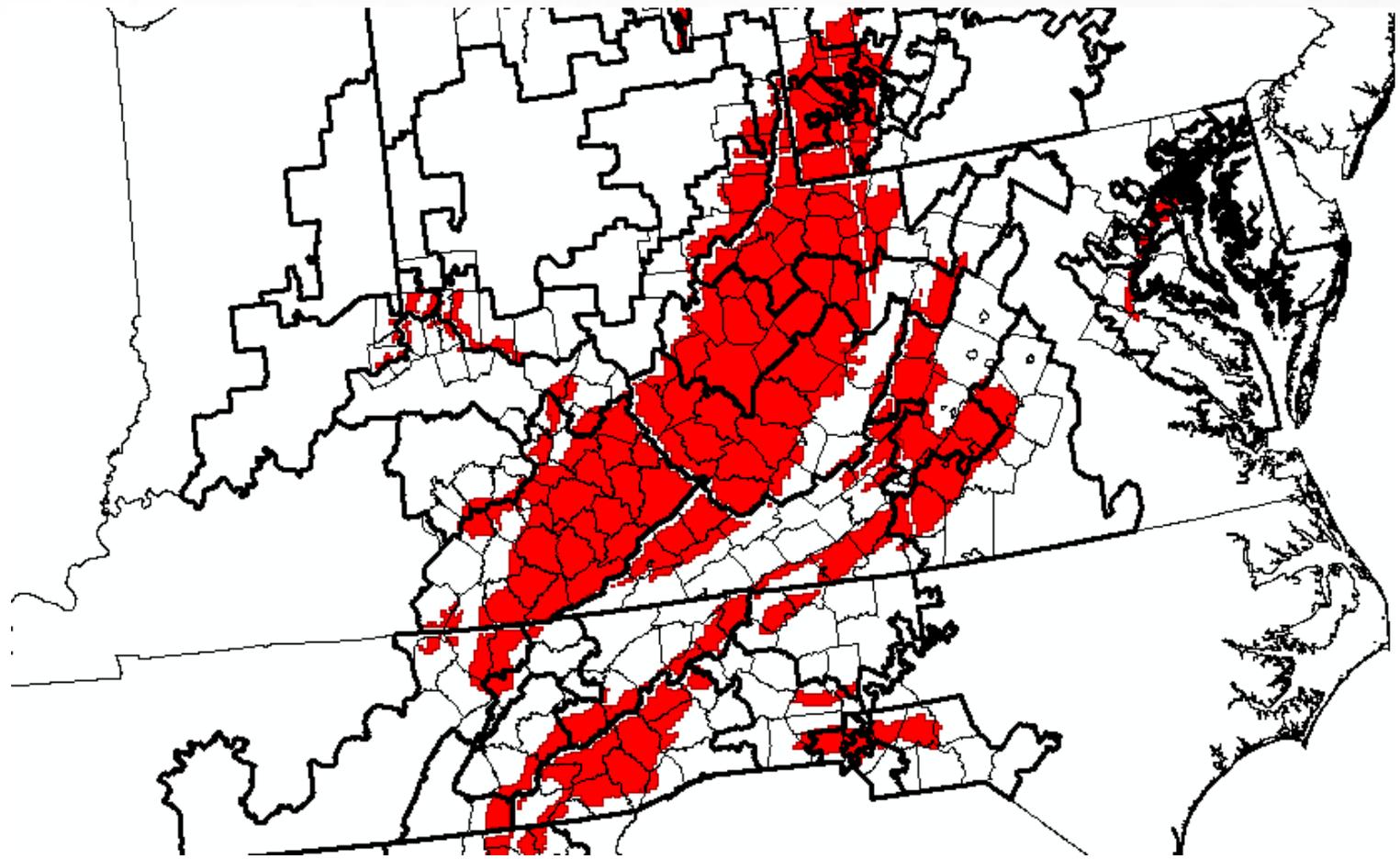
# Georectify

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# New GIS Data From Legislation

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# Analyzing Relationship Between Poverty and Carbon Emissions Controls

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## Questions

- Ranked by carbon intensity, **where** is electricity generated
- Ranked by quality of home insulation, **where** do Low-Income Home Energy Assistance Program (LIHEAP) recipients live
- Ranked by type of home heating source, what is the necessary LIHEAP adjustment for a given carbon tax
- Can carbon tax impacts for LIHEAP recipients be cost-effectively offset by home insulation subsidies



# Population-dependent Data Masking

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## The Challenge

- The US Census Public Use Microdata Sample (PUMS) includes geographies called Public Use Microdata Areas (PUMAs) with a minimum threshold population of 100,000
- In less densely populated areas, geographic data of this geographic granularity doesn't support relating people to place because one can impute private information



# California Water Management

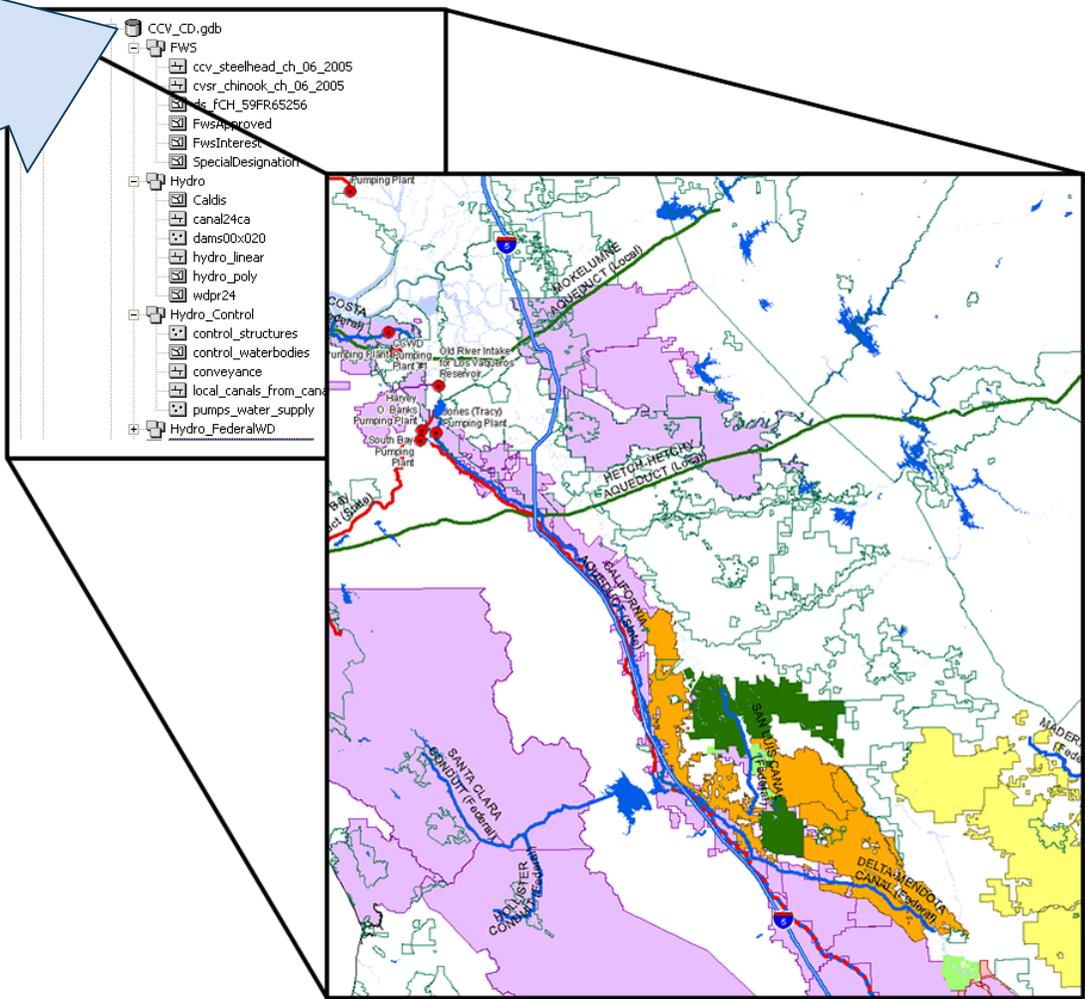
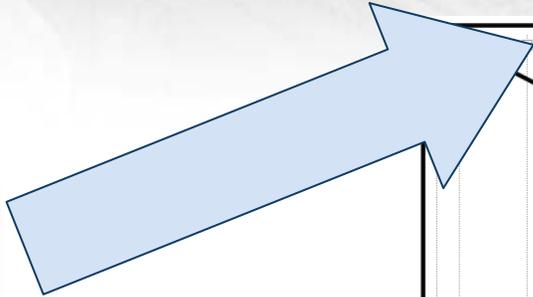
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Relate data from municipal, state and federal sources for long-term water supply analysis including

- Regulatory
- Climatological
- Ecological
- Economic
- Demographic
- Creating the water analysis nexus of databases
  - Take database snapshots  
OR
  - Make dynamic database connections  
Choice contingent on trust



# Data Custody Versus Data Connection





# Conclusions

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- Legislation contains geographic terms that may be used to create geospatial data
- Congress's analytical needs require granular data which may conflict with survey privacy
- Relying on data connections for public policy analysis requires trusted repositories
- End users of GIS data like CRS want to be part of initial preservation planning

