

# Development of Soil Model Parameter Repositories for Modeling in CEAP

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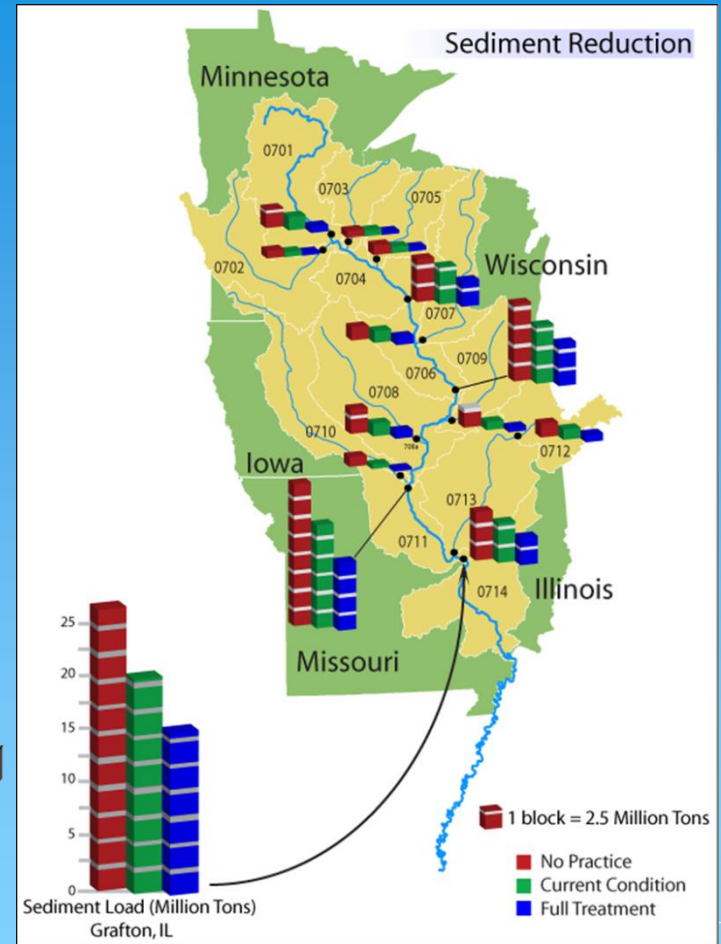
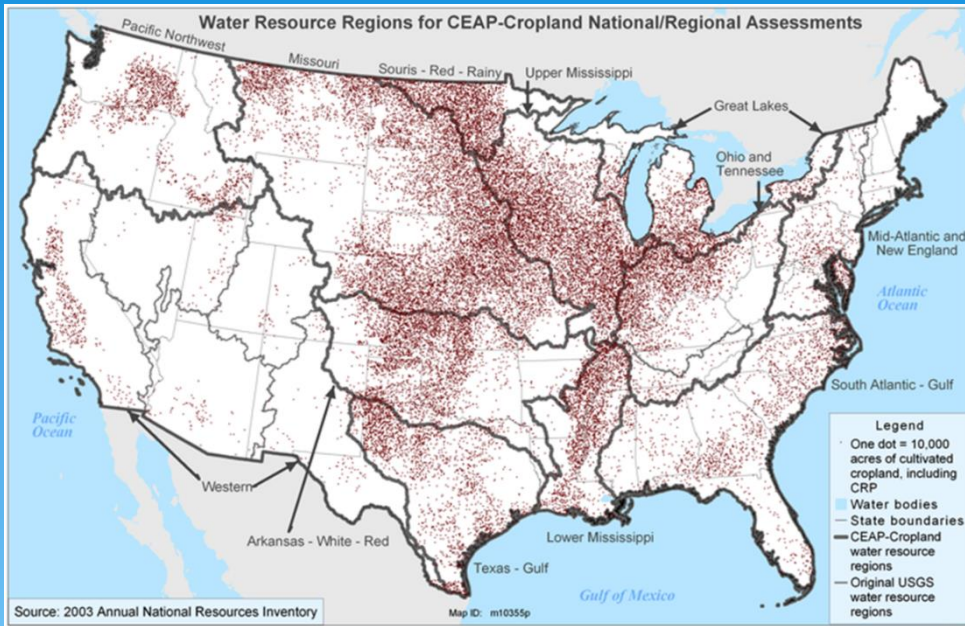
Texas A&M AgriLife Research  
USDA NRCS  
USDA ARS  
Texas A&M AgriLife Research  
USDA ARS



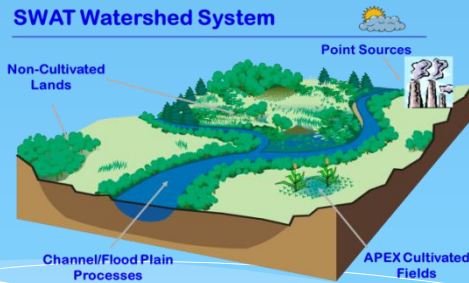
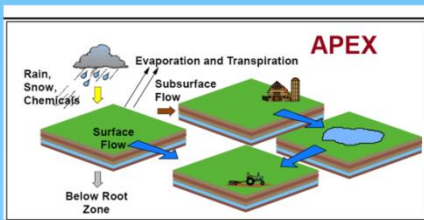
# Presentation Outline

- Background and Scope
- Database developments
- Work in Progress
- Conclusions

# Background: CEAP National

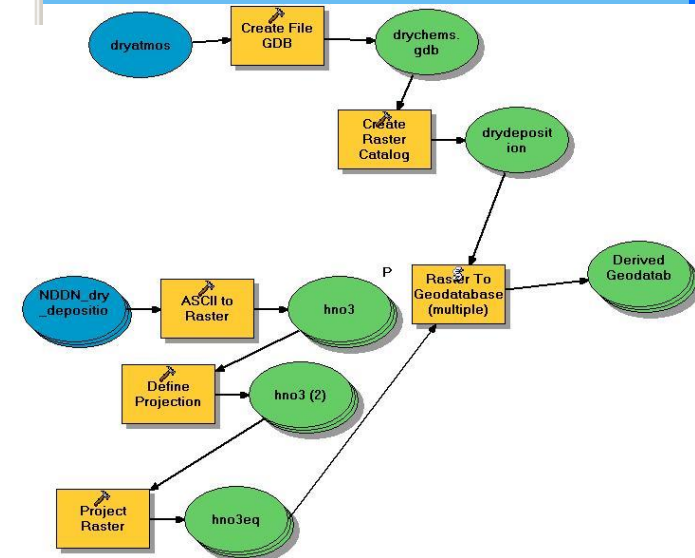
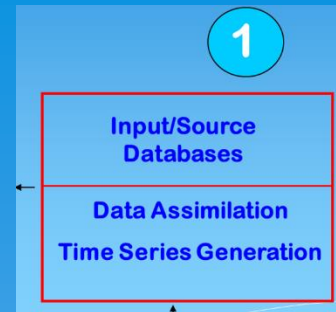
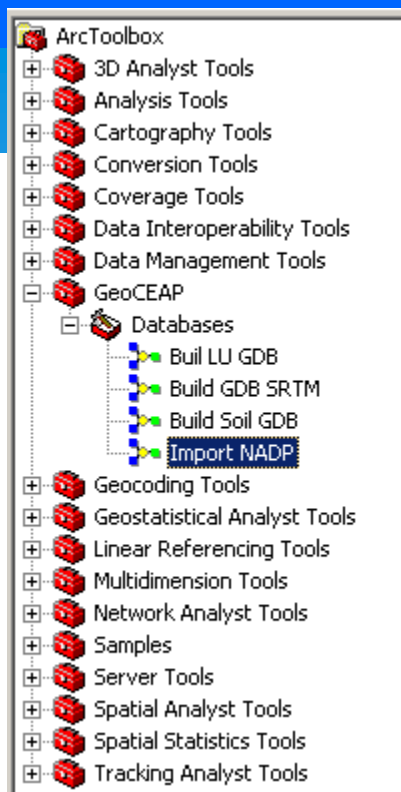
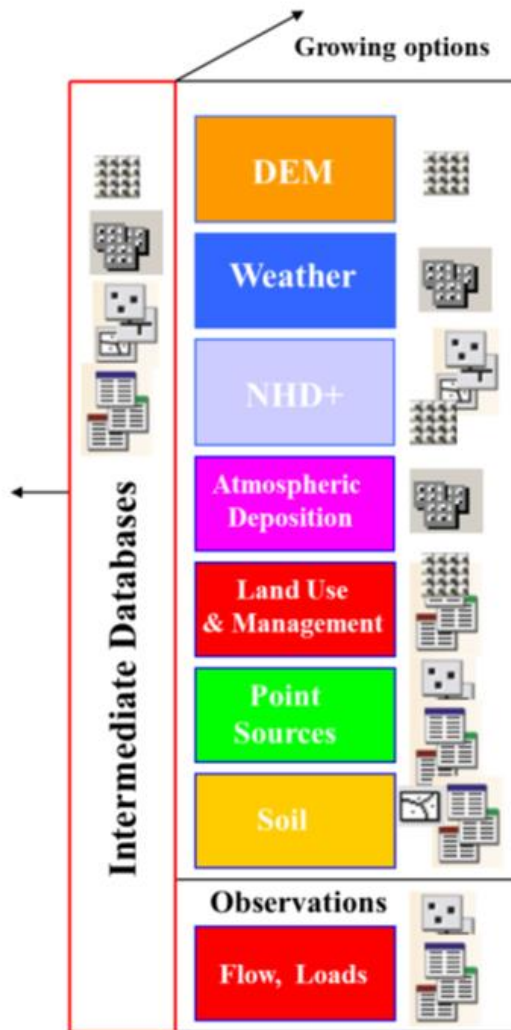


## Agricultural Policy Environmental eXtender



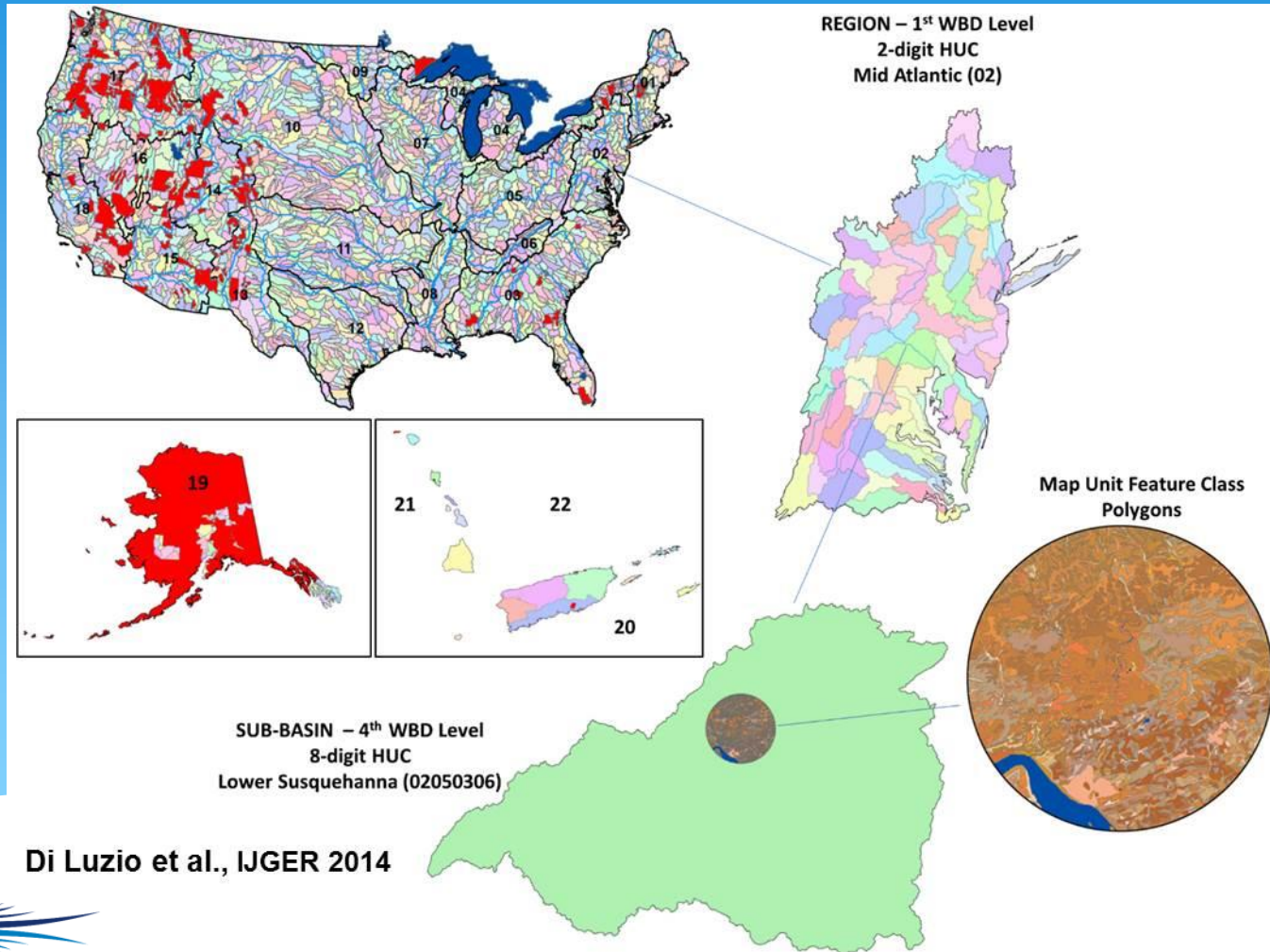
## Soil and Water Assessment Tool

# Scope



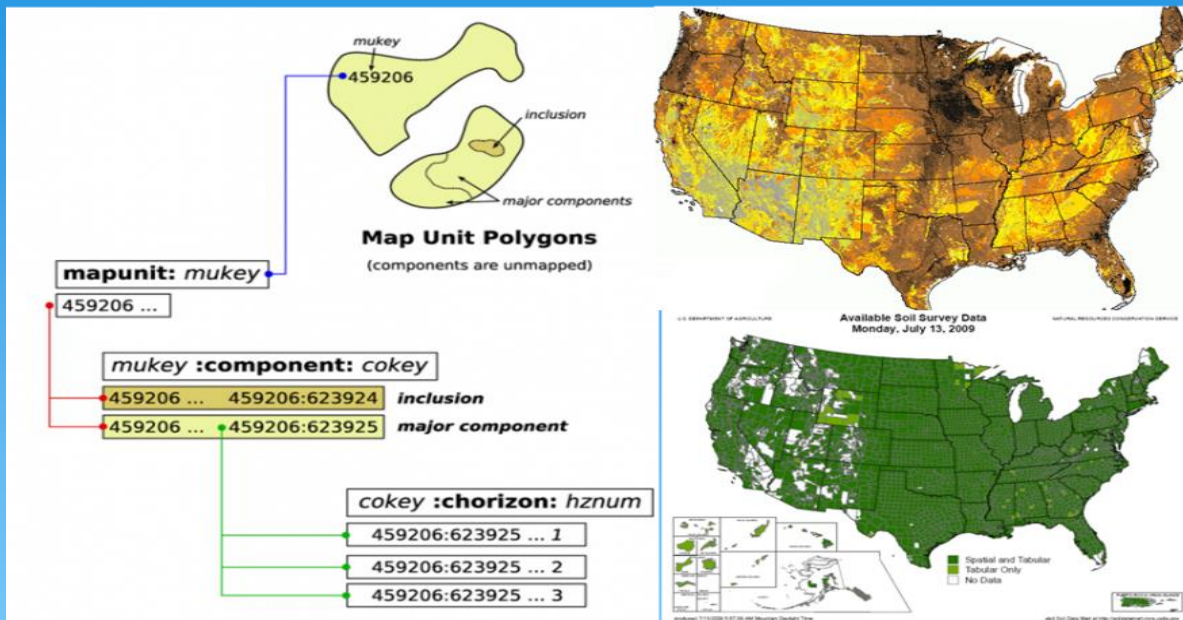


# Scope: US-SOILM-CEAP Construction



Di Luzio et al., IJGER 2014

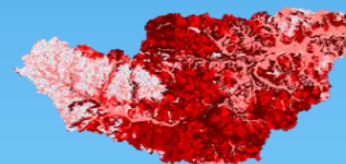
# Data Sources



STATSGO (1:250,000 scale)



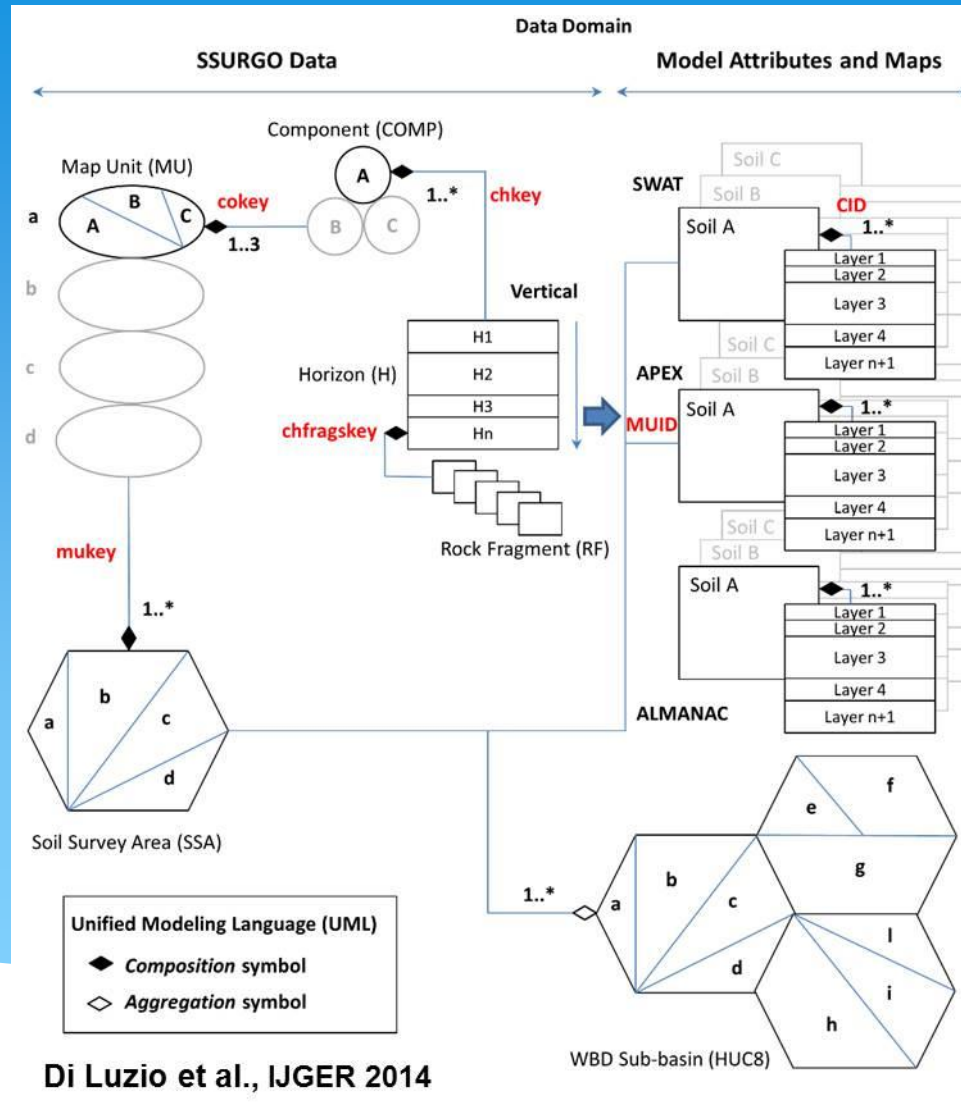
SSURGO (1:24,000 scale)



## SSURGO Tables of Attributes

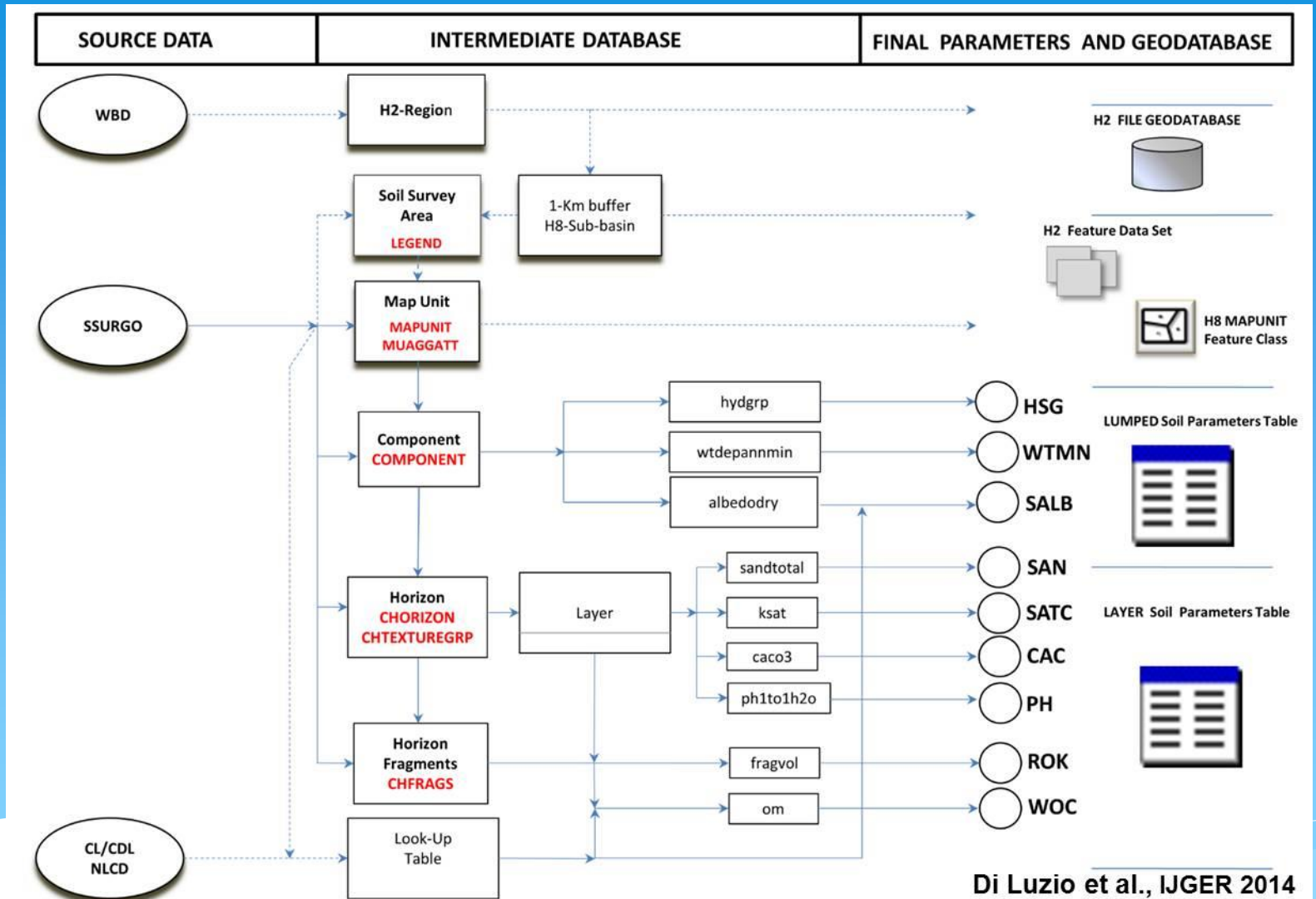
Table	Short Description (USDA-NRCS, 2012)	Level of Detail
LEGEND	Provides the soil survey area that the legend is related to, and related information.	Soil Survey Area
MAPUNIT	Map units included in the referenced legend and data related to the map unit as a whole.	Map Unit
COMPONENT	Map unit components identified in the referenced map unit, and selected properties of each component.	Component
CHORIZON	Horizon(s) and related data for the referenced map unit component.	Horizon
CHFRAGS	Mineral and organic fragments that generally occur in the referenced horizon.	Horizon Fragment
CHTEXTUREGRP	Range of textures for the referenced horizon as a concatenation of horizon texture and texture modifier(s).	Horizon
MUAGGATT	Variety of soil attributes and interpretations that have been aggregated from the component level to a single value at the map unit level to express a consolidated value or interpretation for the map unit as a whole.	Map Unit

# Input/Output Data Structure

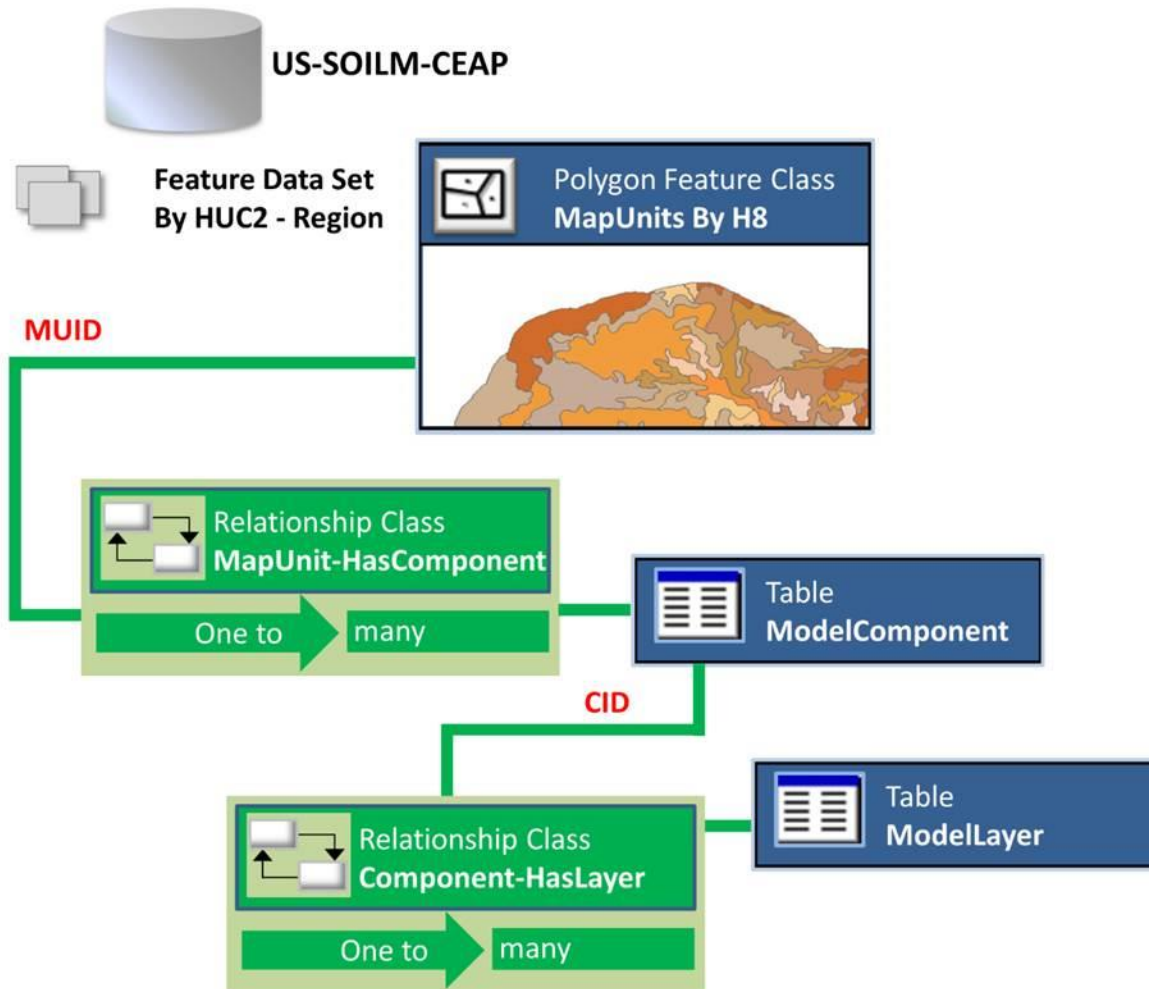




# Processing Workflow



# Relationships



Di Luzio et al., IJGER 2014

# GDB Links

- US\_SoilM\_CEAP\_01.gdb
  - US\_SoilM\_CEAP\_02.gdb
  - US\_SoilM\_CEAP\_03.gdb
  - US\_SoilM\_CEAP\_04.gdb
  - US\_SoilM\_CEAP\_05.gdb
  - US\_SoilM\_CEAP\_06.gdb
  - US\_SoilM\_CEAP\_07.gdb
  - US\_SoilM\_CEAP\_08.gdb
  - US\_SoilM\_CEAP\_09.gdb
  - US\_SoilM\_CEAP\_10.gdb
  - US\_SoilM\_CEAP\_11.gdb
  - US\_SoilM\_CEAP\_12.gdb
  - US\_SoilM\_CEAP\_13.gdb
  - US\_SoilM\_CEAP\_14.gdb
  - US\_SoilM\_CEAP\_15.gdb
  - US\_SoilM\_CEAP\_16.gdb
  - US\_SoilM\_CEAP\_17.gdb
  - US\_SoilM\_CEAP\_18.gdb
  - US\_SoilM\_CEAP\_19.gdb
  - US\_SoilM\_CEAP\_20.gdb
  - US\_SoilM\_CEAP\_21.gdb
- US\_SoilM\_CEAP\_04.gdb
    - H2\_Region04
      - MapUnits\_H8\_04010102
        - Component\_ALMANAC\_H8\_04010201
        - Component\_APEX\_H8\_04010201
        - MapunitHasComponent\_SWAT\_H8\_04010201
          - Component\_SWAT\_H8\_04010201
            - ComponentHasLayer\_SWAT\_H8\_04010201
              - Layer\_SWAT\_H8\_04010201

Identify from: MapUnits\_H8\_02050306

MapUnits\_H8\_02050306

- Hagerstown silt loam, 3 to 8 percent slopes
  - ALMANAC\_component
    - Hagerstown
      - ALMANAC\_Layer
  - APEX\_component
    - Hagerstown
      - APEX\_Layer
  - SWAT\_component
    - Hagerstown
      - SWAT\_Layer
        - Ap
        - Bt1
        - Bt2

Field	Value
CHKEY	542756:1726877
CID	54275601
COKEY	542756:788500
LABEL	1_Ap
LAYERNUM	1
NAME	Ap
OBJECTID	2465
SOL_ALB	0.37
SOL_AWC	0.17
SOL_BD	1.3
SOL_CBN	1.15
SOL_CLAY	25
SOL_EC	0
SOL_K	83.84
SOL_ROCK	14
SOL_SAND	20.5
SOL_SILT	54.5
SOL_Z	250
TEXTURE	SIL
USLE_K	0.32

Identified 1 feature

# Work in Progress

- Comparison and implementation of gap filling methods.
  - Inclusion of the National Cooperative Soil Survey (NCSS) Soil Characterization Data .
  - Models' specs updates.
  - Inclusion of soil quality parameters.
- (Haney R. and L.)



## Conclusions

- **Constructed hydrology-based soil CEAP model parameters repositories combining geo-spatial features and multi-model attributes**
- **US coverage.**
- **Construction is largely automated.**
- **Use of auxiliary GIS information (LULC and WBD maps )**
- **Common data sources for the three models (SWAT, APEX, and ALMANAC).**
- **Raster and/or Polygon geographic features.**
- **Relational attribute tables.**



Thanks!!

