

The background of the slide is a photograph of a natural landscape. In the foreground, there is a field of tall, green grass. In the middle ground, a calm body of water reflects the sky and the surrounding trees. The sky is a clear blue with scattered white clouds. The overall scene is peaceful and natural.

Carbon Management Evaluation Tool Voluntary Reporting Tool for Greenhouse Gases

**A cooperative effort with USDA-
NRCS and Colorado State University**

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COMET-VR Development Team

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CarbOn Management Evaluation Tool Voluntary Reporting of GHG

- Decision Support Tool for estimating carbon storage and GHG emissions

- **COMET-VR**
 - Web-based, easily updated and expanded
 - Interface to Century model

<http://www.cometvr.colostate.edu>



The screenshot shows the homepage of the COMET-VR website. At the top, it features the USDA logo and the text "United States Department of Agriculture". Below this is a navigation menu with links for "Home", "Help", "Contact Us", and "COMET-VR Tool". The main content area is titled "Welcome to the Voluntary Reporting Carbon Management Online Tool (Beta)". It includes an "Introduction" section that describes the tool's purpose for agricultural producers and managers. There are also sidebars for "About COMET-VR" and "About NRCS".



GHGs Sources and Sinks

N₂O sources:

fertilizer applications

nitrogen fixing plants

crop residue

livestock waste

residue burning

cultivation of organic soils

CH₄ sources:

enteric fermentation

rice production

livestock waste

residue burning

CO₂ sources:

lime applications

fossil fuel combustion

cultivation of organic soils

CO₂ sinks:

sequestration in soils

sequestration in

biomass

COMET-VR Development Timeline

- **1980's – Century model researched and developed**
- **1995-2002 – State level and CRP soil carbon assessments (IA, IN, NE)**
- **2002 – COMET-VR development began**
- **2003-2004 - CSRA data gathering conducted**
- **2005 - COMET-VR web available Beta Version**
- **2006 – Web-based COMET-VR used in CSP**
- **2007 - Version 1.1; Prep for 1605(b) Registry interface**

COMET-VR

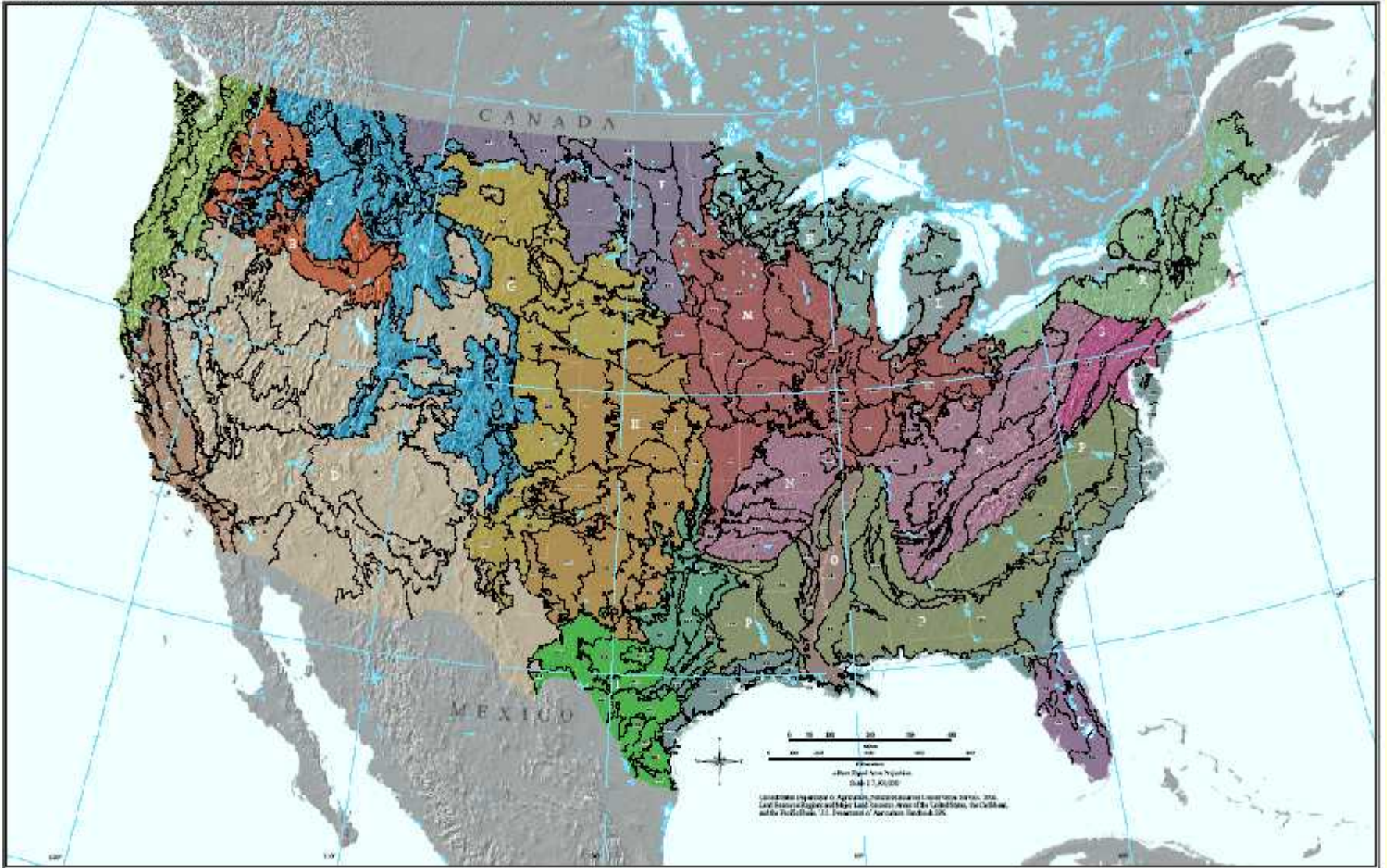
Beta Version

- 20 Land Resource Regions
- < 10 rotation choices per LRR
- 6 soil textures
- Century model w/ uncertainty estimate

Version 1.1

- 226 Major Land Resource Areas
- 20-40 rotation choices per MLRA
- 12 soil textures
- Century model w/ improved uncertainty estimate

LAND RESOURCE REGIONS AND MAJOR LAND RESOURCE AREAS FOR THE CONTIGUOUS U.S. - SIDE A



COMET-VR

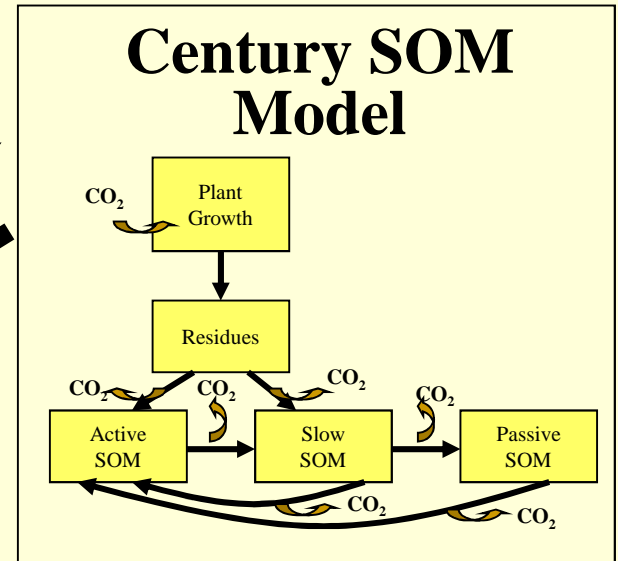
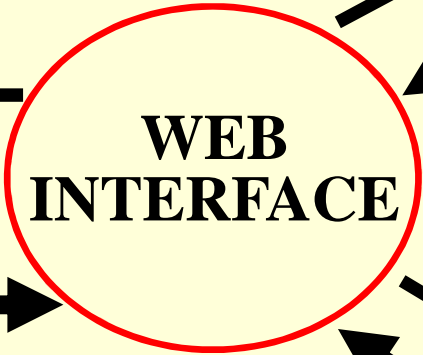
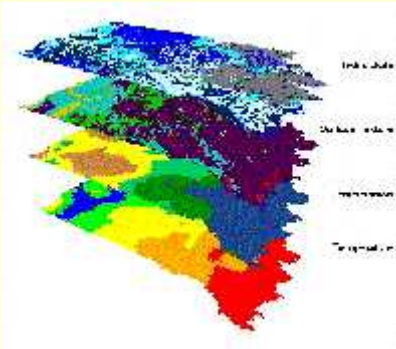
- Input Information
 - Location
 - Parcel Information
 - Parcel Management history – Pre 1970's, 1970-1990, 1990-Current, Current +10 years
 - Soil Information – Texture, Hydric Conditions
- Soil carbon storage change
- Fuel and fertilizer use (from database or user input)

Modeling Procedure

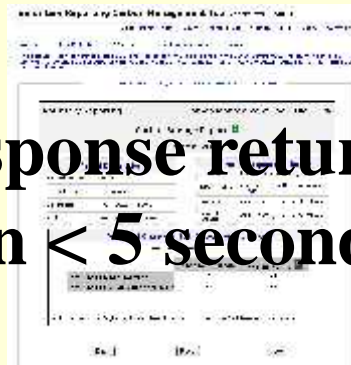
**Survey Data:
Land Use and Mgmt
Data (CSRA)**

STATE	COUNTY	TRACT	LAND USE	...
...

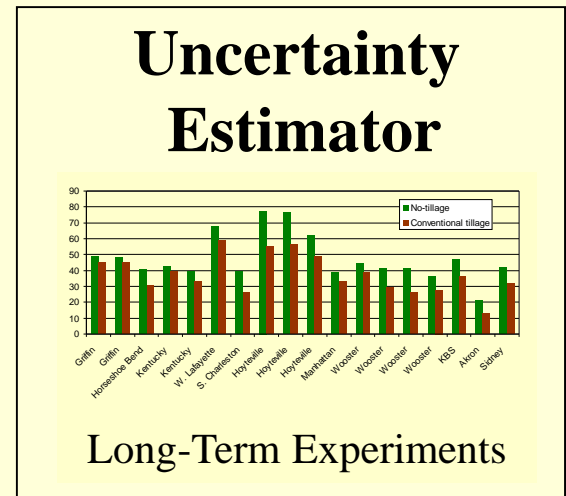
**Spatial Data:
Soils and Climate**



Results 1605b



**Response returned
in < 5 seconds**



Parcel Description	
Parcel Type:	Agriculture
Total Parcels for this Entity:	1
Parcel Name:	North Forty
Parcel Size:	40 Acres
Location:	GIBSON, Indiana
Soil:	Non-hydric silty clay loam

Parcel Management History	
Historic:	Livestock Grazing (pre 1970s)
70s to 90s:	Non-Irrigated; corn-soybean; Intensive Tillage
Current:	Non-Irrigated; corn-soybean; Intensive Tillage
Report Period:	Non-Irrigated; corn-soybean; No Till Tillage

Predicted Change in Soil Carbon for the Parcel

Annual Change for 2007

	Carbon Change	Uncertainty ?	
		Avg Percent	
Total Tons Carbon per year:	1.93	19.14	
Total Tons CO2 Equivalent per year:	7.07	19.14	

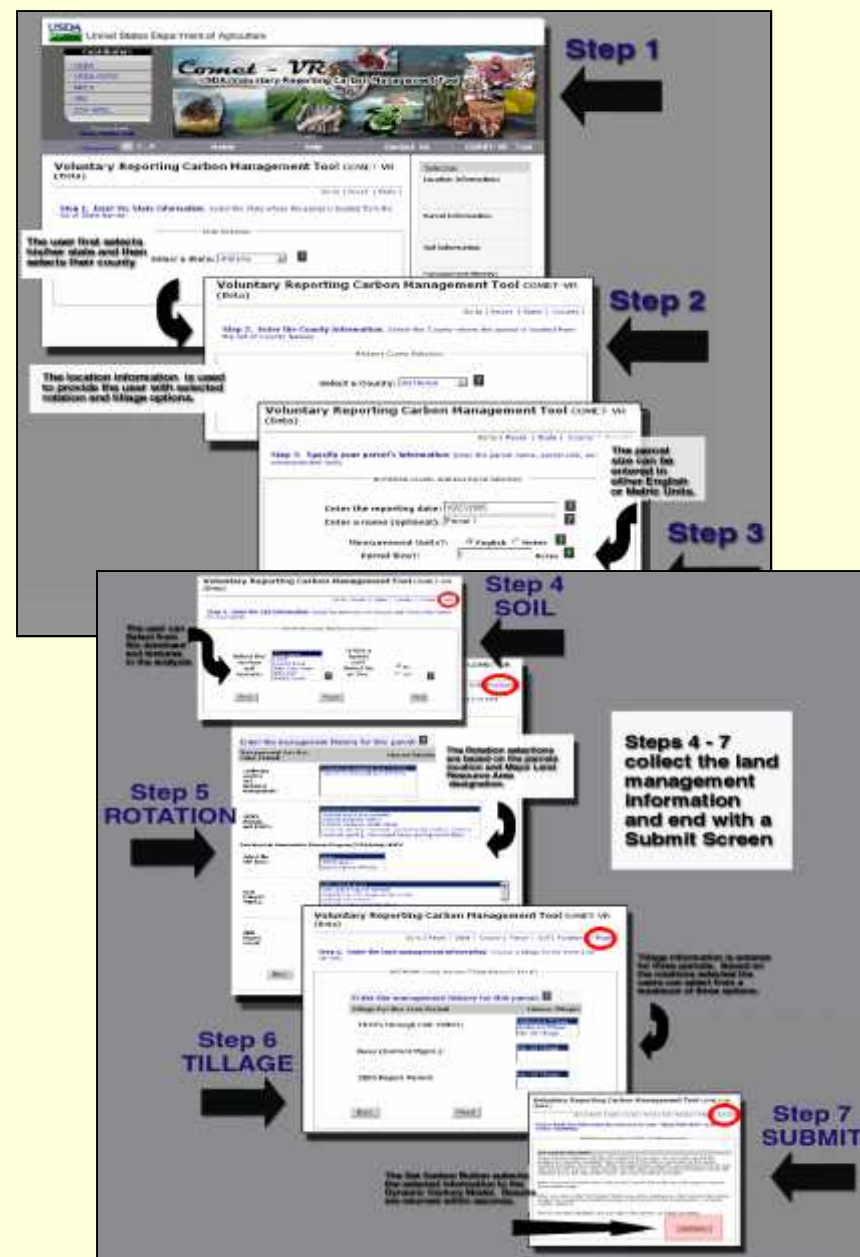


COMET-VR Enhancements:

- Additional crop rotations
- Agroforestry options
- Improved feedback, user response
- Tool evaluations/questionnaires
- Improved uncertainty estimator

Future

- NOx & methane estimates



For more information:

- <http://www.airquality.nrcs.usda.gov>
- <http://www.cometvr.colostate.edu>