

**UNIVERSITY OF FLORIDA**  
***Carbon Capture and Sequestration***

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**Description:** Rising CO<sub>2</sub> concentrations in the atmosphere and effects on global climate change have been well documented, and future impacts are uncertain but potentially devastating. Florida's natural and agro-forest ecosystems have much potential to sequester carbon in biomass and soils due to unique climatic and landscape conditions. However, research gaps exist to accurately assess carbon pools and fluxes at coarse scales, ranging from county to the region and larger. The overarching objective of this project is to address these obstacles by creating a terrestrial carbon information system (called "TerraC") for the carbon science community, focused on ecosystems in Florida. The information system will be administered through the UF Carbon Resources Science Center (<http://carboncenter.ifas.ufl.edu>), a multi-disciplinary Center dedicated to research in support of enhanced agricultural and natural resource carbon management.



**Budget:** \$398,880

**Universities:** UF

### **Progress Summary**

A conceptual design for the Terra Carbon Information System (Terra C) was developed. The core database structure, variable types, names, data types and meta data fields were established. The workflow steps to use the Terra C system are the following: A template is generated by the user that is then downloaded and populated with carbon data, which may include carbon measured in soils, plants/biomass, roots, water or air. Carbon data may be provided as totals, fluxes or as fractions (pools). In addition other data associated with carbon (e.g. bulk density in soils, nutrients, or environmental data) may be added to the data template. After the template is populated by the user it is uploaded into the core database (SQL) of the Terra C system. The template ensures data compatibility with data already stored in the database, while it allows adding additional data to the template. Thus, the template (and database structure) will grow with time as more users use the Terra C system.

After reviewing other public data sharing platforms, we developed a data sharing policy, data quality standards, and a usage policy. We also assembled material and resources to build the Terra C web site (<http://terrac.ifas.ufl.edu>), which is in development since all material will need to be carefully reviewed before release to the live web site. The data sharing policy will be based on the *Creative Commons Licensing* scheme and includes: (i) Attribution (the data user must give credit to the project leader (or project) in the manner specified by the him/her (but not in any way that suggests that the project leader endorses the data user or his/her use of the data); (ii) Noncommercial: The data user may not use TerraC data for commercial purposes; and (iii)

Share Alike: If the data is modified in any manner or used to derive other products, the data user may distribute the resulting work only under the same or similar license to this one. Data stored in TerraC can be shared at three access levels. The access levels are chosen by the project leader to control access to their projects by different users.

Different access levels can be assigned to different users, the level being project- and user-specific. Levels 1 and 2 mirror the roles of data user and data manager, respectively. Level 3 is the most restricted access level.

Level 1 – Public with read-only access: Access to the data is open to all TerraC users. Any person that has a TerraC user account (i.e. data user) can view the data, but not modify it directly from the TerraC database.

Level 2 – Private read/write access: Access to the data is open to the users data were assigned manager status (i.e. data managers), who can view and modify the data directly from TerraC. *Private read/write access* is password-protected.

Level 3 – Private read-only access: Access to the data is restricted to the project leader and users selected by the project leader, who in turn can only view the data, but not modify it directly from TerraC.

The project leader controls the sharing of data in TerraC. He/she provides leadership for collaboration with new partners on behalf of the project teams. The project leader can switch sharing levels from Level 3 to 2 and 1, but not vice versa, meaning if the data are released to other users or the general public this right cannot be reversed.

Data users who wish to access a protected dataset can contact the project leader and negotiate a data use agreement. The project leader may agree to share data with the data user to collaborate on a joint project, work on a co-authored research publication, or other purpose.

In addition, test carbon data sets from projects in the Soil and Water Science Department and School of Forest Resources and Conservation, UF have been acquired to be streamlined into the Terra C system. However, this process is time consuming since all meta data for carbon and environmental data need to be documented.

A new Post-Doc, Biao Zhong, started to work on the project May 1, 2010. The previous Post-Doc, Gustavo Vasques, accepted another position elsewhere; and thus there was a transition period in the first quarter of this year to make the new project team member familiar with the project.