

Information Technology Team Highlights

March 1, 2011 – February 29, 2012

The vision for the AgMIP IT infrastructure was begun at the global AgMIP kickoff meeting in Long Beach, CA, USA in October 2010, with the development of the [IT protocols](#). Further preliminary work at informal meetings and teleconferences was accomplished by the various IT team members during the following year leading up to the first core AgMIP IT development funds from DFID in November 2011. At that time a full-time IT Expert was hired at the University of Florida to begin to develop the AgMIP IT infrastructure. Figure 1 illustrates the general categories of tools that are envisioned to enable the multiple climate, crop, and economic models to be used for model intercomparisons and assessments. The highlighted components represent those areas where AgMIP IT work is currently in progress.

Data harmonization / data

translation. One of the goals of the AgMIP project is a comparison of the simulated results from various crop models for the purposes of quantifying model uncertainties and as a basis for model improvement. Multiple crop models are used to generate simulated estimates of crop yields and other data using identical input data for each model. But the format of the input data varies among the models. Input data for the various models include text files, XML files, spreadsheets, databases,

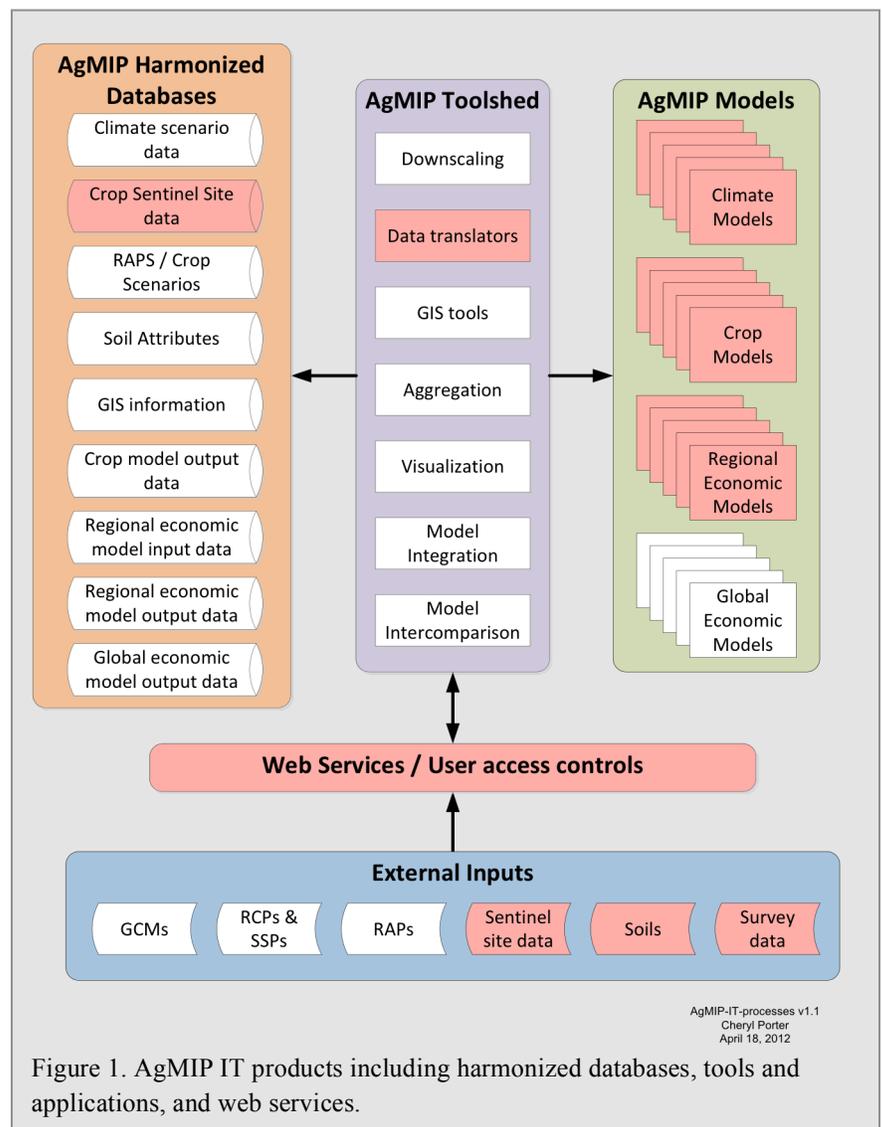


Figure 1. AgMIP IT products including harmonized databases, tools and applications, and web services.

etc. Manual translation of data into the various model formats is not practical for large amounts of data that will be processed by AgMIP researchers. To solve this problem, AgMIP will store crop experiment data in a harmonized data format as shown in Figure 2. We are in the process of developing the data translation tools which write to the model-specific formats. The AgMIP IT team is working with the crop model development teams for each crop model to accomplish this goal through a series of rapid development workshops. The first IT development workshop was part of the AgMIP South Asia Regional workshop held at ICRISAT in Patancheru, India, February 20-24, 2012. We paired crop model experts with software application developers to produce data translation tools for producing model-ready input files for DSSAT, STICS and Infocrop models. Tools were also developed to read data from a spreadsheet containing yield trial data into the ACE harmonized database. Additional tool development workshops are currently being planned to generate additional data translation tools.

Crop model input data from field experiments comprise just one category of data that will be used by AgMIP researchers. Other data types, as listed in Figure 1, are climate scenarios, generalized soil properties, GIS raster and vector data, Representative Agricultural Pathways (RAPs) and crop scenarios, crop model output data, regional economic model inputs and outputs, and global economic model outputs. Each of these categories of data will be associated with a harmonized database, an API and the data translation tools appropriate for the associated models. We have begun work on the AgMIP crop model outputs (ACMO) database, which define the variables which are output from the crop models and input to the regional and global economic models. Work has also begun to interact with the global economic modelers to define harmonized data outputs from those models.

Open source development. An open source development environment has been established to enable and encourage distributed and collaborative work on tools and applications related to AgMIP modeling, data translation, aggregation and analysis. This site is hosted at [Github](#) and currently includes the ACE database API (Application Programming Interface) and data translation tools for 5 crop models (DSSAT, APSIM, STICS, ORYZA, and Infocrop). A wiki describing AgMIP tool development protocols is hosted at research.agmip.org. The wiki shows

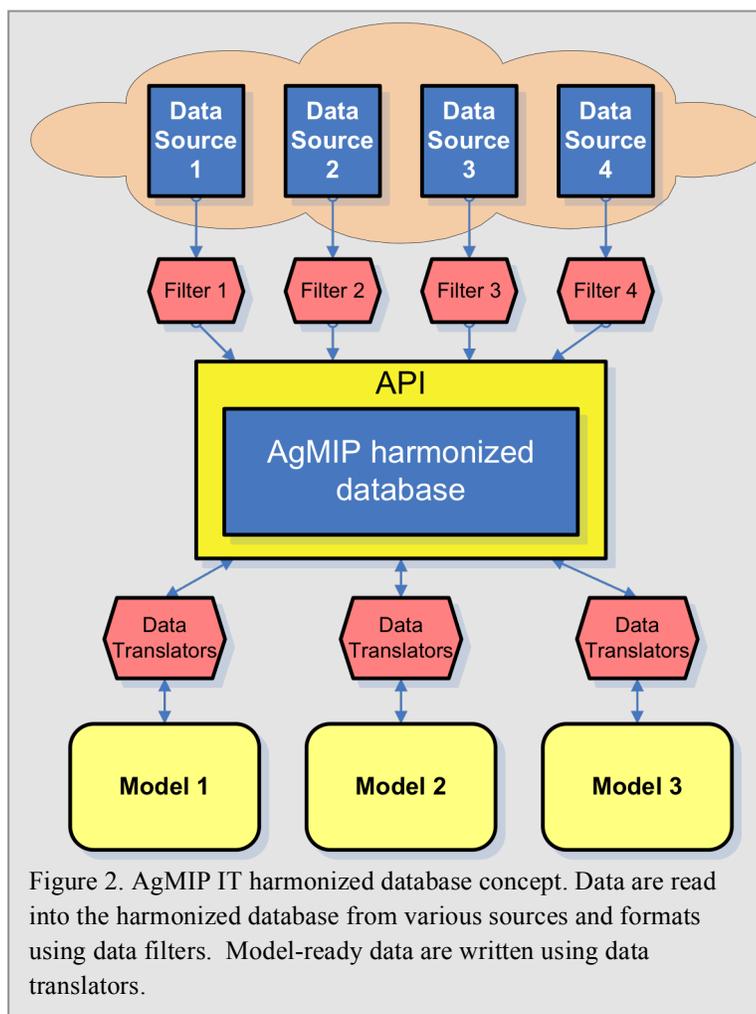
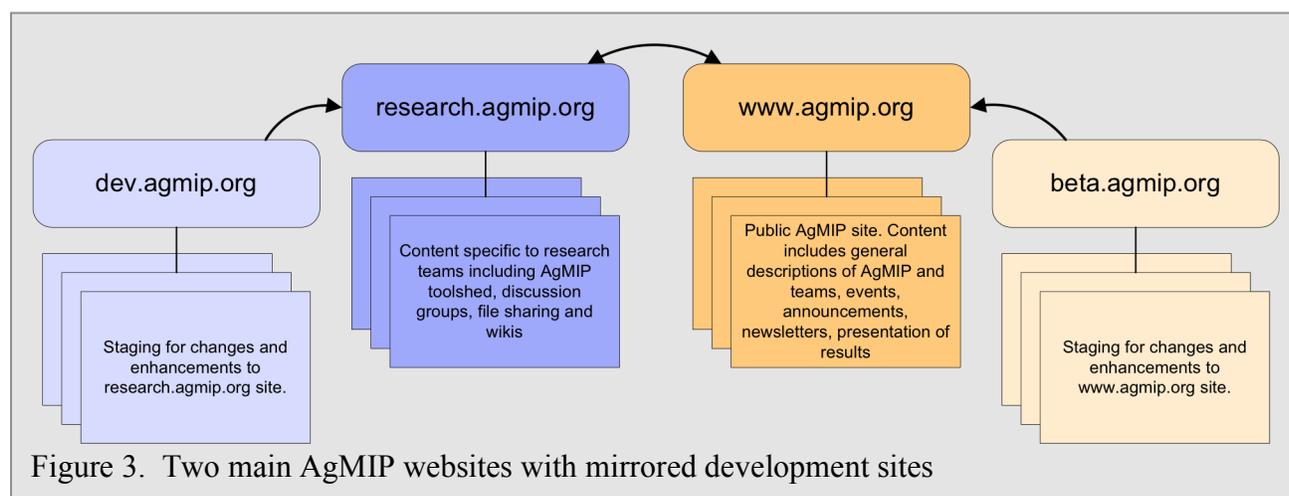


Figure 2. AgMIP IT harmonized database concept. Data are read into the harmonized database from various sources and formats using data filters. Model-ready data are written using data translators.

information about our development environment, coding standards, and the GIT version control system. AgMIP applications developers can sign up for a GitHub account and begin collaboration immediately.

AgMIP websites. AgMIP will provide two main web sites as shown in Figure 3, the first providing information directed primarily towards stakeholders and the general public, and the other providing content relevant to AgMIP researchers. Each site will be backed by a development site for staging of new content or revisions to the web layout. The two sites may be hosted separately and will be constructed and maintained with different tools; however links between the two main AgMIP websites will allow users to easily navigate all main areas of the AgMIP.org web domain.



The AgMIP public website is www.agmip.org, which presents general information related to AgMIP, descriptions of teams and project work, lists of events, announcements, and publications, archive of newsletters, and presentation of results of our research. This site content is entirely open to anyone with a browser. The corresponding site, beta.agmip.org, will be used as a staging area for development of new web layouts, changes to content organization, and experimentation with website widgets and applications. The public site uses Wordpress for content management and is currently hosted at University of Passo Fundo in Brazil. Reorganization of this site is currently being done at Columbia University and University of Florida.

The AgMIP research portal, research.agmip.org, will contain content specific for AgMIP researchers including discussion groups; file sharing; documentation wikis; the AgMIP toolshed; links to the harmonized database and data translation tools, and links to the AgMIP collaborative tool development site on GitHub. While some content, such as the wikis, will be freely accessible, other areas may be restricted to users with the proper authentication. This research site is under development, but has the basic functions available for discussion groups, wiki development and file downloading.

CCAFS / CGIAR collaborations. The IT team has several collaborative projects with CCAFS. One of these involves the coordination of data formats with the AgTrials group lead by Glenn

Hyman at CIAT. We have defined the common metadata and a minimum set of yield trial information that will be stored in the ACE and AgTrials databases. This is being done to ensure that data can easily be shared for crop experiment data and yield trials data for crop model use. Similarly, we have coordinated with CIMMYT researchers to synchronize data archiving requirements such that the ACE database can be used to store and access yield trial data from the CGIAR systems. Other collaborations with CCAFS include the [model documentation wiki](#) being coordinated at the James Hutton Institute by Mike Rivington, an AgMIP IT team member.