

## MAGGnet

**Managing  
Agricultural  
Greenhouse  
Gases network**



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Mandan, ND, USA

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# Presentation Overview

- Review
- Update
- Future



**MAGGnet**

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# MAGGnet - Development

CRG Work Plan, Component 1: *Quantifying net greenhouse gas emissions in cropland management systems*

Standardized protocols and methods for determining GHG emissions and carbon sequestration

⇒ International database on agricultural management influences on GHG fluxes, carbon sequestration (including long-term experimental sites)

Practices for minimizing GHG emissions and sequestering carbon in different soils, environments, cropping systems

Emission factors for specific countries

Summary documents for decision makers

# MAGGnet – Description

## *In a nutshell...*

- An international greenhouse gas network of experimental sites and research expertise.

## *More specifically...*

- A coordinated, multi-national effort that serves as a foundation for inventory and analysis of greenhouse gas mitigation research.
- Project seeks to compile metadata from experimental sites\* throughout the world where greenhouse gas fluxes and soil carbon dynamics are monitored.

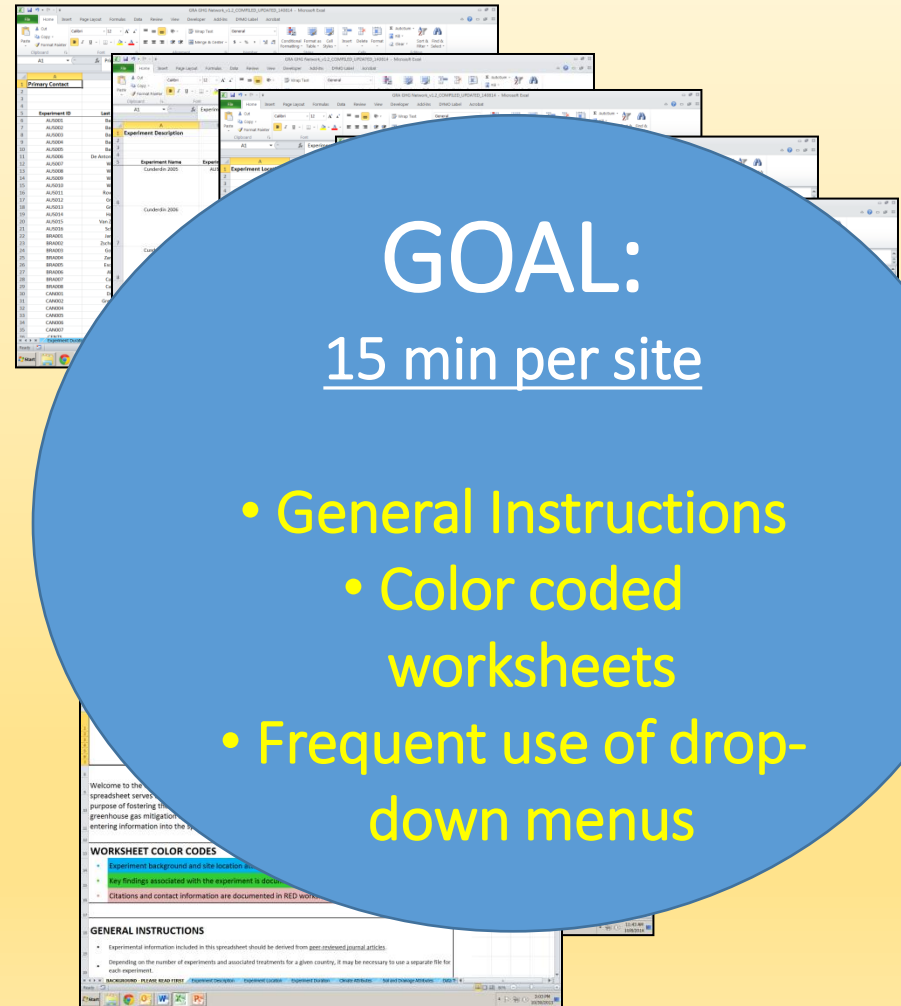
\*[Sites with published data]

# MAGGnet

## Metadata Entry Template

### Worksheet Tabs

- Experiment description
- Experiment location
- Experiment duration
- Climate attributes
- Soil and drainage attributes
- Data type
- Treatments
- Key Findings
- Journal citations
- Primary contact



**GOAL:**  
15 min per site

- General Instructions
- Color coded worksheets
- Frequent use of drop-down menus

Review

Update

Future

## Managing Agricultural Greenhouse Gases Network (MAGGnet)

### About MAGGnet

MAGGnet represents a coordinated, multi-national approach for inventory and analysis of greenhouse gas mitigation research.

MAGGnet seeks to compile metadata from experimental sites throughout the world where greenhouse gas fluxes and soil carbon dynamics are monitored. Priority is given to sites with published data.

Since 2012, MAGGnet has compiled metadata from over 300 experimental sites from 19 countries. Metadata contributors include scientists engaged in the Croplands Research Group and Paddy Rice Research Group of the Global Research Alliance on Agricultural Greenhouse Gases.

### Joining MAGGnet

To obtain access to the latest versions of the MAGGnet metadata entry template and sharing agreement, please login to the GRA website and join the Managing Agricultural Greenhouse Gases (MAGGnet) Group. Access to the GRA website is limited to Alliance Member Countries and can be obtained by contacting the GRA Secretariat ([secretariat@globalresearchalliance.org](mailto:secretariat@globalresearchalliance.org)).

Files available for download include:

- Metadata Entry Template: MAGGnet\_Site Information\_v1.2\_BLANK\_Dec2014.xlsx
- Sharing Agreement: MAGGnet Metadata Sharing Agreement\_Dec2014.pdf

Alternatively, the template and sharing agreement may be obtained from the MAGGnet Coordinator (contact information listed below).

### Contact Details

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<http://www.globalresearchalliance.org/research/croplands-research-group/croplands-research-group-activities/quantifying-net-greenhouse-gas-emissions-in-cropland-management-systems/maggnet/>

# Progress since Debrecen



- Inclusion of new/updated sites
- Metadata sharing agreement
- Collaboration with GRA Paddy Rice Group
- GRAMP interface
- FACCE-JPI project activities
- Share/Learn/Engage





## MAGGnet - July 2015

All changes saved in Drive

 Add layer  Share☐ Untitled layer☒ MAGGnet - July 2015 Uniform style All items (157)☐ Base map

- 14 unique climate subdivisions
- 11 surface soil textures

- 20 countries
- 315 experiments
- 8 experiments in Brazil





# Experimental Sites Summarized

## Status

- 233 completed
- 82 ongoing

## Duration

- 214 short-term (<1-3 yr)
- 54 mid-term (>3-10 yr)
- 47 long-term (>10 yr)

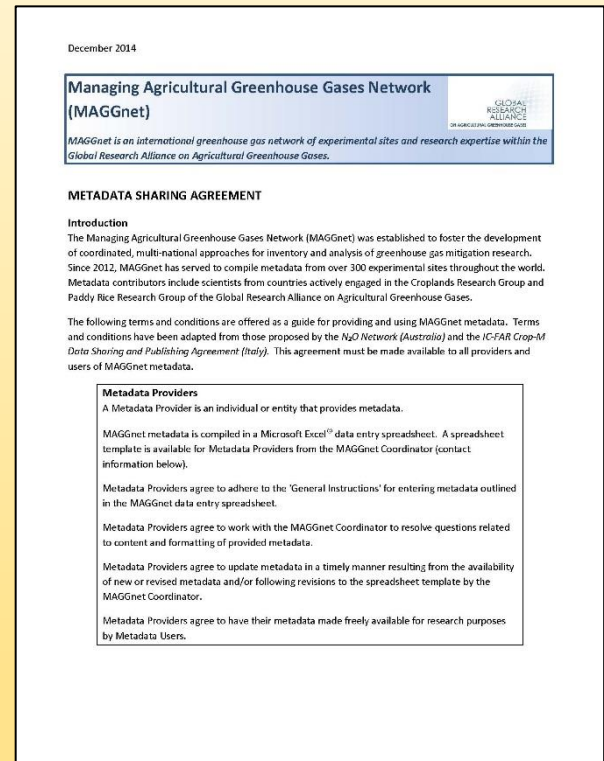
## Common Treatments

- Fertilizer rate (68)
- Manure/Amendments (52)
- Tillage type (43)

Soil/GHG/Plant parameter	Projects measuring parameter (%)
Soil carbon	83
N <sub>2</sub> O flux	82
CO <sub>2</sub> flux	45
CH <sub>4</sub> flux	29
Grain	56
Stover	35
Roots	9

# Metadata Sharing Agreement

- Expectations/Responsibilities for providers and users of MAGGnet metadata.
- Agreement modeled after terms/conditions developed for *N<sub>2</sub>O Network* (Australia) and *IC-FAR Crop-M Data Sharing and Publishing Agreement* (Italy).



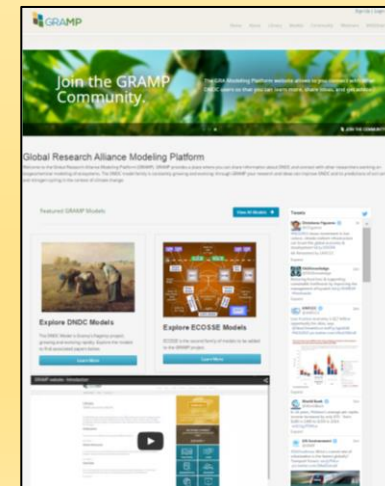
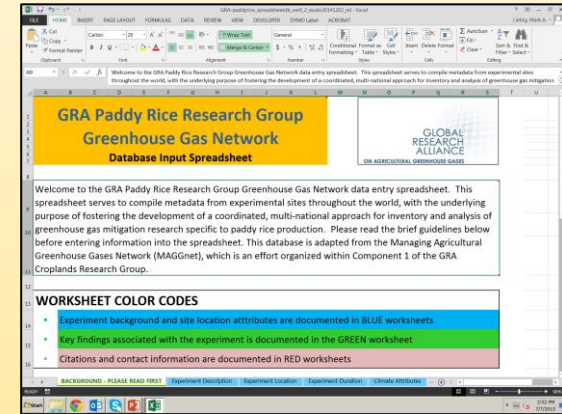
# Collaborations

## GRA Paddy Rice Research Group

- MAGGnet template adapted for rice production
- Japan, Indonesia, Philippines, Thailand, and Vietnam (13 sites)

## GRAMP (Global Research Alliance Modeling Platform)

- 'Distilled' MAGGnet metadata shared through interactive map



# FACCE-JPI Project Activities

USDA National Institute of Food and Agriculture

Award No.: 2014-35615-21934

- Compile response data for select sites (N<sub>2</sub>O flux, soil organic C stocks, crop yield)
- 97 available sites (Australia, Denmark, Finland, France, Germany, Italy, Japan, Uruguay, USA)
- 126 publications (currently being screened for applicable data)

EXPERIMENT BACKGROUND				CLIMATIC ATTRIBUTES		SOIL ATTRIBUTES
Country	ID	Started (yr)	Ended (yr)	MAP (mm)	MAT (°C)	Surface soil texture
Australia	AUS001	2005	2006	368	18.3	Sand
Australia	AUS002	2005	2007	368	18.3	Sand
Australia	AUS003	2007	2008	368	18.3	Sand
Australia	AUS004	2008	2009	368	18.3	Sand
Australia	AUS005	2009	2010	374	18.5	Sand
Australia	AUS006	2011	2012	776	18.2	Clay
Australia	AUS007	2006	2009	728	17.2	Clay
Australia	AUS008	2005	2006	1585	14.4	Clay Loam
Australia	AUS009	2006	2007	1672	23.3	Sandy loam
Australia	AUS010	2009	2011	1672	23.3	Sandy loam
Australia	AUS014	2010	2011	677	13.2	Sandy clay loam
Australia	AUS015	2011	2012	1800	19.2	Clay Loam
Australia	AUS016	2009	2010	630	17.8	Clay
Brazil	BRA003	2003	2005	1440	19.4	Clay
Denmark	CENTS-FO	2002	Ongoing	626	7.3	Sandy loam
Denmark	CENTS-FL	2002	Ongoing	559	7.8	Sandy loam
Denmark	CROPSYS-FO	1997	Ongoing	626	7.3	Sandy loam
Finland	FI1	2000	2002	607	4.3	Clay
Finland	FI2	2000	2002	607	4.3	Loamy sand
Finland	FI3	2001	2002	561	2.0	Sand
Finland	FI4	2001	2002	607	4.3	Clay
Finland	FI5	2001	2001	626	4.5	Clay
Finland	FI6	2005	2010	607	4.3	Clay
Finland	FI7	2005	2010	607	4.3	Clay
Finland	FI8	2005	2010	626	4.5	Clay
Finland	FI9	2005	2010	618	4.2	Sand
Finland	FI10	2005	2007	607	4.3	Clay
Finland	FI11	2005	2006	607	4.3	Sandy clay
Finland	FI12	2006	2007	607	4.3	Sandy clay
France	MicMac	2011	Ongoing			
France	IWM-Dijon	2000	Ongoing			
France	ICC	2008-2009	Ongoing			
France	PRW	2007	2011			
France	Biolnter	2011	2013			
France	Grignon	2010	Ongoing			
France	En Crambade	2010	Ongoing			
France	Morville	2010	Ongoing			
France	Villedieu	2010	Ongoing			
France	Doignies	2010	2011			
France	Cartigny	2011	Ongoing			
France	Sourches	2010	Ongoing			
France	La Jaillière	2010	Ongoing			
France	Sinnamary	2010	Ongoing			
France	Saint Quentin	2010	Ongoing			
France	Mons ORE	2011	Ongoing			

# Share/Learn/Engage

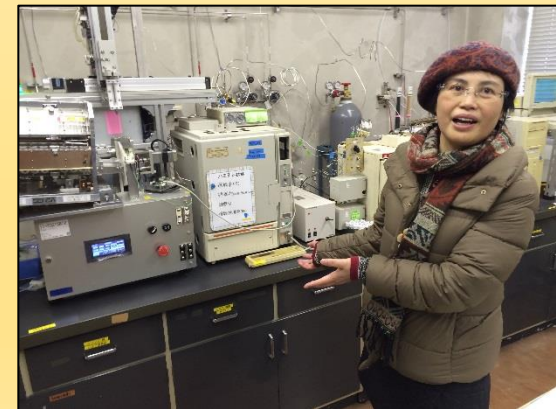
## *Measuring Nitrous Oxide Emissions from Soil Workshop,* Long Beach, CA, Nov. 2014

- MAGGnet overview
- Link to video to be posted soon



## *NIAES/USDA Scientific Exchange,* Tsukuba, Japan, Feb. 2015

- GRA/MAGGnet overview
- Novel gas analysis methods
- Environmental markets for improved soil management



# Moving Forward

- Continue expansion of meta-database
- Progress on FACCE-JPI work plans
- Refine/Update input for GRAMP interactive map
- Explore collaborations/partnerships
  - I&M Workgroup
  - CABI



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