GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

# Managing Agricultural Greenhouse Gas Network

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*Measuring Nitrous Oxide Emissions from Soil*

*6 November 2014, Long Beach, CA*

# MAGGnet Overview

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- Background – GRA / CRG / MAGGnet
- Template Description / Current Status
- Recent Activities / Next Steps

# Background

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## It begins with the Global Research Alliance…

- **The Global Research Alliance on Agricultural Greenhouse Gases is a consortium of 42 countries working together to find ways to grow more food without growing greenhouse gas emissions.**

# Background

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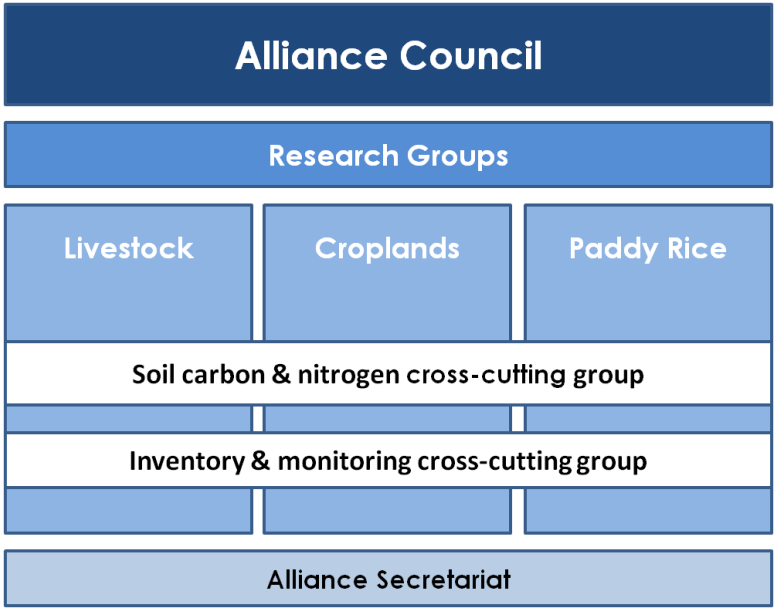
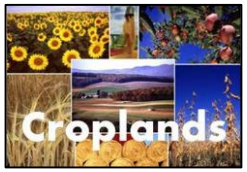
- **The Global Research Alliance is composed of five research groups:**
  - ✓ Livestock
  - ✓ Croplands
  - ✓ Paddy Rice
  - ✓ Soil C&N
  - ✓ Inventory/Monitoring



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# Croplands Research Group Focus

## Component 1

**Quantifying net greenhouse gas emissions in cropland management systems**

*Leaders: Brazil, USA*

## Component 2

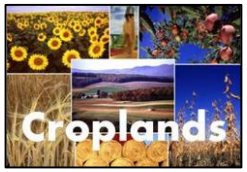
**Assessing greenhouse gas emissions in agricultural peatlands and wetlands**

*Leaders: Finland, Norway, Sweden*

## Component 3

**Modeling nitrous oxide emissions and soil carbon stocks**

*Leaders: France, USA*

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# Component 1 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)

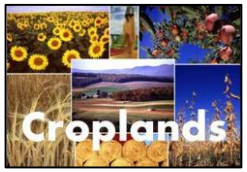
Practices for minimizing GHG emissions and sequestering carbon in different soils, environments, cropping systems

Emission factors for specific countries

Summary documents for decision makers

**MAGGnet**

**M**anaging **A**gricultural **G**reenhouse **G**as **net**work

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# Background

## *More specifically…*

- **MAGGnet represents a coordinated, multi-national approach 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]
- **Initiated February 2012. Major activities include two metadata calls, update, and grant proposal (FACCE-JPI).**

# MAGGnet

## Metadata Entry Template

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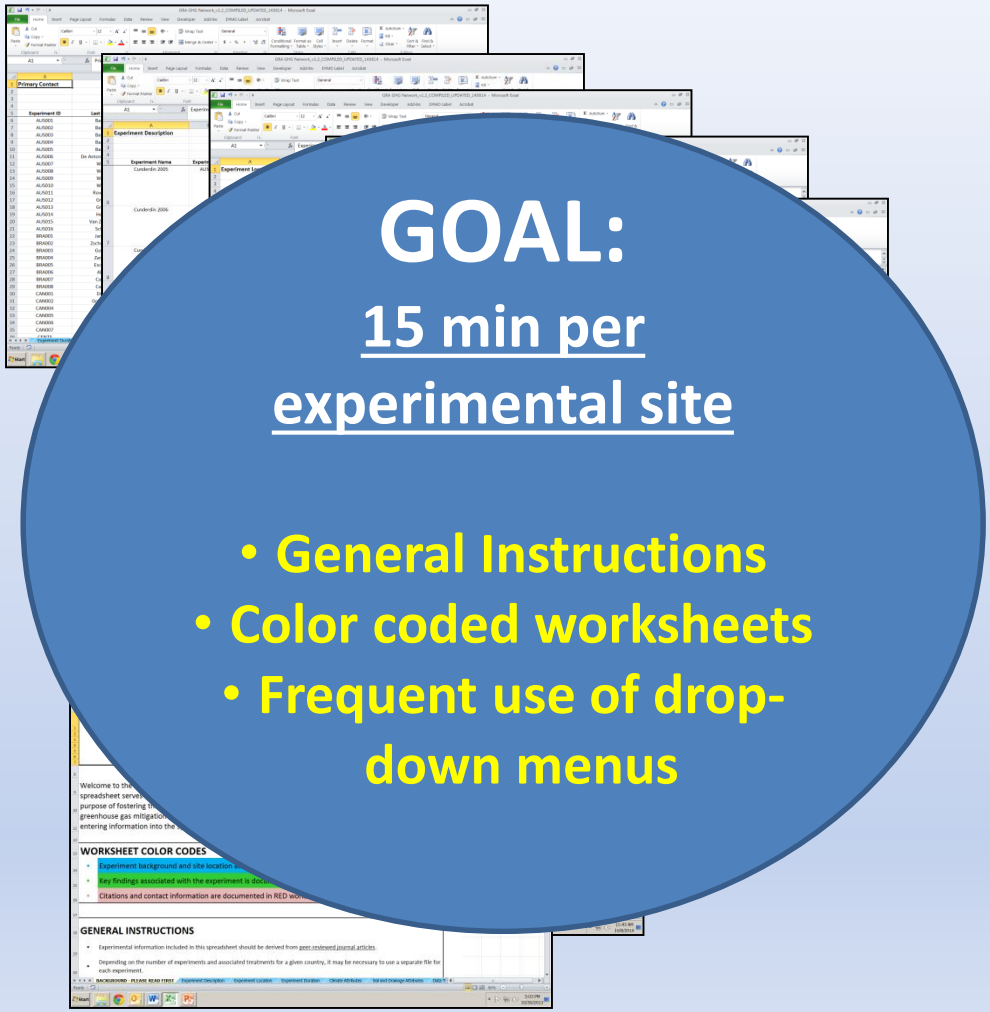
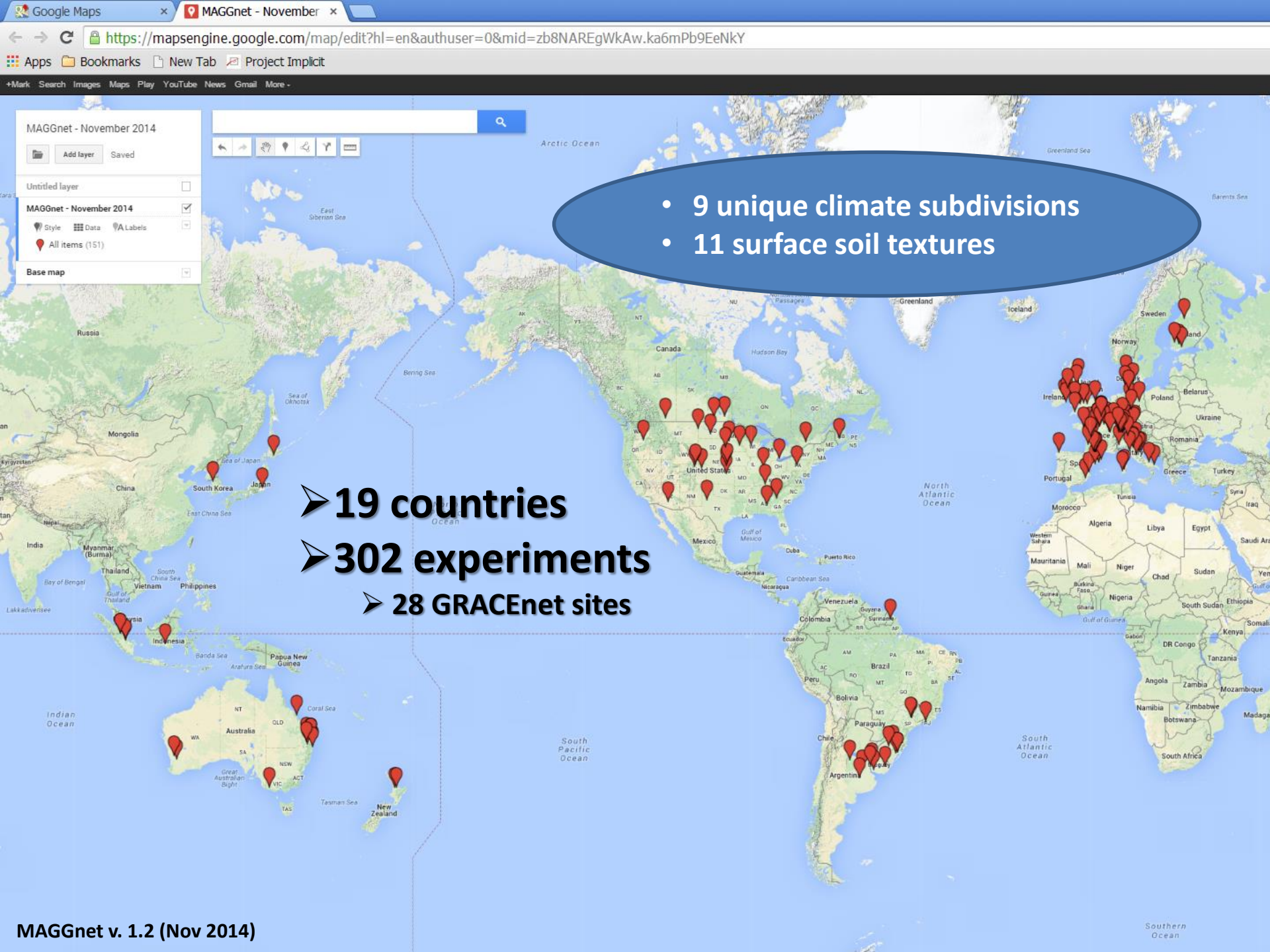
### Worksheet Tabs

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




Google Maps
MAGGnet - November
https://mapsengine.google.com/map/edit?hl=en&authuser=0&mid=zb8NAREgWkAw.ka6mPb9EeNkY
Apps
Bookmarks
New Tab
Project Implicit
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Add layer
Saved
Untitled layer
MAGGnet - November 2014
Style
Data
Labels
All items (151)
Base map
• 9 unique climate subdivisions
• 11 surface soil textures
➢19 countries
➢302 experiments
➢ 28 GRACEnet sites
MAGGnet v. 1.2 (Nov 2014)

# Metadata Synopsis

## Experiment Duration; Data Collection

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### Status of experiments

- 223 completed
- 79 ongoing

### Duration of experiments

- 203 short-term (<1-3 yr)
- 53 mid-term (>3-10 yr)
- 46 long-term (>10 yr)

| Soil/GHG/Plant parameter | Projects measuring parameter (%) |
|---|---|
| Soil carbon | 79 |
| $N_2O$ flux | 80 |
| $CO_2$ flux | 43 |
| $CH_4$ flux | 28 |
| Grain | 55 |
| Stover | 32 |
| Roots | 8 |

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# Metadata Synopsis

## Experimental Treatments (Top 10)

| Treatment component | Number of Experiments Evaluating Component |
|---|---|
| Fertilizer rate | 63 |
| Manure/Compost | 51 |
| Tillage | 42 |
| Fertilizer type | 40 |
| Crop rotation | 38 |
| Residue management/removal | 34 |
| Pasture/Grazing | 26 |
| Crop type | 23 |
| Cover crop | 20 |
| Irrigation | 17 |

MAGGnet v. 1.2 (Nov 2014)

# MAGGnet

## Recent Activities

- **Model Intercomparison Exercise**
  - GRA Soil Carbon and Nitrogen Cycling Cross-cutting Group
  - MAGGnet used to help identify sites for modeling exercise
- **Template used by GRA Paddy Rice Research Group**
  - Effort led by Japan with site contributions from Indonesia, Philippines, Thailand, and Vietnam (13 sites)
- **Development of MAGGnet Metadata Sharing Agreement**
  - Adaptation of agreements by IC-FAR Crop-M (Italy) and $N_2O$ Network (Australia)
  - To be posted on GRA website

# MAGGnet

## Next Steps

- **Initiate activities in FACCE-JPI Work Package 1**
  - Add response data for select sites (GHG emission, soil organic C stocks, crop yield)
- **Ongoing Effort…**
  - ***Share*** the purpose, current status, and future direction of MAGGnet
  - ***Learn*** how MAGGnet can better serve the modelling community
  - ***Engage*** others to increase involvement in MAGGnet

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# Thank you for listening!

**www.globalresearchalliance.org**