Collaborative Effort building-off continuing CIGs

Acres of Rice Harvested 2012
Census of Agriculture
Long, but successful process with many partners

ACR protocol: *Voluntary Emission Reductions in Rice Management Systems*  
*American Carbon Registry Protocol Basics*

- Defines eligible practices and Rice-Growing Regions
- Uses DNDC to model soil C dynamics, CH₄ and N₂O emissions in baseline and project. Inputs include:
  - Management data: cultivar planted, yields, planting and harvesting dates, flooding depths, flooding and draining dates, residue management, fertilization dates and amounts
  - Information on soils, precipitation, etc. specific to project
  - Many default values or can be pre-loaded in model
- Provides methods to verify lack of bias in DNDC
ACR protocol: *Voluntary Emission Reductions in Rice Management Systems*

*American Carbon Registry Protocol Basics (Continued)*

- Provides up-front calibration and validation of DNDC, by Rice-Growing Region, to quantify uncertainty deduction
- Minimum 5 fields / 1,000 acres in Project
- Common practice and field-specific baselines
- Designed for aggregation or “collectives”
  - Multiple farmers, each with multiple fields enrolled; one Aggregator or APD
- Specifies monitoring and verification requirements
  - Flexible methods to reduce cost without sacrificing rigor
ACR Protocol Eligible Practices

For Voluntary Emission Reductions

California:
- Straw removal after harvest
- Dry seeding (drill seeding)
- Early drainage at end of growing season

Midsouth:
- Straw removal after harvest
- Early drainage at end of growing season
- Intermittent flooding (alternate wet and dry)
- Reducing N fertilizer application rates
- Increasing water use efficiency and pumping efficiency:
  - Convert contour levees to precision or zero grade
  - Side inlet/poly piping systems
  - Efficient diesel pumps
  - Convert to electric pumps
  - Soil moisture sensors
- Staggered winter flooding
**Emission Reductions in Rice Management Systems**

**Timeline of Emission Reduction Creation**

- **2010 Start of the methodology development for low-carbon rice production**
  - Developed by Terra Global Capital with support from Applied GeoSolutions, Environmental Defense Fund, and CA Rice Commission
  - Identification of eligible practices

- **2011 Multi-partner CIG**
  - Terra’s partner role - to create the first “middle layer” or interface between DNDC and farmer users

- **2013 Project development expands into the Midsouth**
  - Entergy, an energy company in the Midsouth, and White Water Irrigation District join to start project development in the Midsouth

- **2013 Main Protocol and California regional calibration module published**

- **2014 Midsouth regional calibration module published**
  - Mississippi River Delta (Arkansas, Mississippi, Missouri)
  - Louisiana Gulf Coast
  - Texas Gulf Coast
Emission Reductions in Rice Management Systems

Timeline of Emission Reduction Creation (Continued)

• 2014 CIG Granted for Continued Work
  - Complete the validation and verification of the credits under ACR
  - Reduce verification and on-going monitoring costs – more farmers to participate
  - Increase the adoption of low emission rice practices in California and the Midsouth
  - Establish proof-of-concept for “low-carbon footprint” or “sustainably produced” rice.

• 2015 December California Audit - Field Visit
  - 3 participating farmers in Colusa and Glenn Counties in California’s Sacramento Valley.
  - VVB Environmental Services, Inc.

• 2016 October Midsouth Audit - Field Visit
  - 5 participating farmers in Prairie, McGhee, Desha, Mississippi and Craighead Counties in Arkansas, and Coahoma, Bolivar, and Washington Counties in Mississippi
  - VVB SCS

• 2017 June Credits Issued
  - 302 (CA) and 395 (Midsouth) credits issued through ACR
  - The first project in the world to have credits from rice management systems

• 2017 June Credits Sold
  - All credits purchased by Microsoft
  - Checks to written to farmers (July)
PRESTO - Producer Environmental Sustainability Tool

**Online User-interface tool for DN-DC**

**PRESTO**

Online system that creates cost-effective ways for rice growers to supply verified GHG emission reductions to the voluntary and compliance markets and generates incremental on-farm revenue.
We support the development of market mechanisms structured to conserve and sustain ecosystem services.

<table>
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We support the development of market mechanisms structured to conserve and sustain ecosystem services.

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Terra Global Capital

We support the development of market mechanisms structured to conserve and sustain ecosystem services.

Projects: Emission Reductions in MidSouth Rice Management Systems

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<th>Flooding</th>
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We support the development of market mechanisms structured to conserve and sustain ecosystem services.
Farmers must be committed to change practices for additional reasons not just sale of carbon

- Many participating farmers want to be “part of the solution” and not blamed for causing climate change.
- Savings in water use/reduction in late season river diversion
- Savings in pumping costs (fuel use)
- Opportunities for consumer labeling to recognize sustainable production
- Committed extension partners are important to keep the work going

Balancing act with parallel protocol developing and early actor implementation

- Project design, protocol development, tool creation, and GHG Plans were being carried out simultaneously.
- The parent protocol was approved after practices were carried out, and in some cases missing the required monitoring data.

DNDC not commercially operational until very late in process, requiring complex inputs and tedious calibrations

- Many hours formatting files, calibrating models, and running different model versions
- New revisions/versions not applicable to specific registries/protocols
- Audit by standards was put “on-hold” many times.
Data gathering for farmers comprehensive and requires technology and field support

- Data gathering difficult for these early action farmers as some requirements were not known at practice years
- Capturing evidence requires field and web-based capture systems
- Investment in technology greatly reduced data collection and GHG quantification processing time.

Cost benefit from carbon revenue alone not attractive

- Combination of tons/acre and market prices, generate little carbon revenue/acre
- Carbon price alone, will not drive framers to change practices, but may help offset costs

Emission Reductions were lower than expected

- California; 2 farmers, seven fields, 501 acres, and 302 tCO$_2$e over two years
- Midsouth; 5 farmers, 30 unique fields, 1,794 acres and 395 tCO$_2$e over three years
Continual work on or CIG 2014

- Lowering the costs of monitoring and verification achieved through the integration and improvement of Terra’s web-based platform PRESTO.
- Increasing adoption rates (scaling farmers) for low emission rice practices
- Proof-of-concept for labeling for “low-carbon footprint” or “sustainably produced” rice

Participation of New Farmers in new Projects

- Now the tools, technology, and protocols are in place for scaling-up adoption of practices and creating new projects.
- Increase in interest in rice and agriculture offsets
- Focus on increasing demand through compliance and local regulatory channels
Thank You!

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