

California Air Resources Board

Rice Cultivation Projects Compliance Offsets Protocol

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Cultivated rice soils emit significant quantities of methane (Yan et al., 2003). Over the past eight years EDF has worked with partners to develop market-based solutions to reduce the amount of methane. The practices identified which reduce methane include draining wetland rice once or several times during the growing season (Sass, 1994; Smith and Conen, 2004; Yan et al., 2003; Khalil and Shearer, 2006), sowing dry seeds rather than aerially applying pre-germinated seeds (Adviento-Borbe, 2013), and draining a rice field seven to 10 days earlier than usual (find scientific citation). These practices were incorporated into a compliance-based carbon offset protocol which was adopted by the California Air Resources Board (ARB) on June 25, 2015. This was the first crop-based protocol to be adopted by any cap-and-trade program.

The new protocol is important because:

- The program rewards rice farmers for implementing a set of practical approaches that reduce emissions.
- Rice farmers can generate a new revenue stream through carbon credits without impacting their yield.
- Important wetland habitat will be maintained for wildlife and bird populations.

Why rice?

- Rice is one of California's largest crops and contributes more than \$5 billion a year and 25,000 jobs to the state's economy.
- The science on the carbon and nitrogen cycle of rice is well established.
- Rice cultivation emits methane, a potent greenhouse gas.



One of the eligible practices - dry seeding

- Rice farmers have long been at the forefront of innovative farming practices that promote sustainability.

How does it work?

- Farmers can volunteer to implement one of three methods included in the protocol: dry seeding, early drainage, or alternate wetting and drying.
- Dry seeding is the practice of sowing dry seeds rather than aerially applying pre-germinated seeds.
- Early drainage refers to draining the field seven to 10 days earlier than usual.
- Alternate wetting and drying is the practice of periodically flooding and then drying down a field throughout the growing season.

What are the rules?

- Interested rice producers will provide historical information to create a baseline. Then producers will submit records collected throughout a growing season to quantify the amount of methane emissions

reduced by undertaking one or more of the three management practices on their land.

How is this protocol unique?

- This is the first protocol to measure GHG reductions from crop-based agriculture.
- The emissions reductions are quantified yearly, based on weather and a producer's management decisions.
- The emissions reductions are permanent and never have a chance of being re-released into the atmosphere.

What has the response been from rice growers to the protocol?

In collaboration with the California Rice Commission and the White River Irrigation District, 21 rice farmers on more than 22,000 acres from California, Arkansas and Mississippi (almost 1% of all rice grown in the U.S.) are participating in carbon offset projects. In early 2016 the first carbon credits will be generated from a California rice cultivation offset project.

How did the protocol incorporate feedback collected from a thorough stakeholder engagement process?

- Conducted four Technical Working Group meetings, two Workshops, and independent consultations and presentations.
- Included diverse stakeholders, including rice growers in California and the Midsouth, agricultural trade groups (e.g. California Rice Commission, California Farm Bureau), conservation groups (Ducks Unlimited, Point Blue, TNC, Audubon), project developers, project registries (ACR, CAR), verifying bodies, and compliance entities.

How does the protocol set the stage for other land-based protocols?

- Allows growers to work together to decrease the administrative costs and increase the economic efficiency. (Staff Report p.20)
- Simplifies verification requirements by highlighting multiple options, including "remote sensing, video conferences, digital photographs (dated and geotagged), or digital escrow services." (Staff Report p.18)
- Eases the burden to report data from the DNDC model by streamlining its use.

- Has the framework to enable the creation of additional protocols including a Nutrient Management Compliance Offsets Protocol.



What is the broader GHG reduction potential for the agricultural sector?

GHG mitigation from the agricultural sector is gaining in profile in the UNFCCC negotiations with focused attention planned after the Paris negotiation. The agricultural sector has the potential to contribute substantially to GHG emission reductions with potential ranges from 5 to 20 per cent of total carbon dioxide (CO₂) emissions by 2030, and a global mitigation potential (excluding fossil fuel offsets from biomass) ranging from 5.5 to 6 Gt of CO₂e/year by 2030. The IPCC's Fifth Assessment Report shows that agriculture is a cost-effective option for significant GHG emission reductions in the short term. The current transformation in energy systems and infrastructure is starting, but will take time to put in place. In the near-term, agriculture has a significant role to play in meeting short- to medium-term GHG emissions reduction targets.