DEVELOPMENT AND ASSESSMENT OF PAYMENT FOR WATER SERVICE PROGRAMS ON RANCHLANDS IN THE NORTHERN EVERGLADES

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The Headwaters of the Everglades is a ~1.1-million-hectare watershed with ranchland as the dominant land use. These ranchlands are recognized as valuable not only for food production, but also for biodiversity and water services. The South Florida Water Management District (SFWMD) operates the Dispersed Water Management (DWM) program which includes the Northern Everglades Payment-for-Environmental-services (NEPES) focused on water retention and nutrient removal services in the Northern Everglades basins. NEPES was designed to pay for added water retention on private cattle ranchlands by raising the spillage level of drainage control structures to slow and reduce surface flows. We predicted that increased hydration of previously drained wetlands would benefit biodiversity, a previously unquantified but desirable co-benefit of the program. However, we expected that some tradeoffs such as loss of forage would occur. The objectives of this study were: 1) Examine biodiversity co-benefits of enhanced water retention on ranchlands in the headwaters of the Everglades; 2) Assess potential tradeoffs for ranchers including loss of forage or increased mosquitos; 3) Develop a decision support system to integrate hydrology, biodiversity, user defined preferences and implementation cost. We used general linear mixed models and model selection to evaluate the feasibility of explicit, a priori hypotheses using data from 15 wetlands sampled across four participating ranches. Our study indicated that managing for increased water retention could result in both co-benefits and trade-offs among ecosystem services. Higher water retention increased wetland plants in wetlands and was associated with reduced mosquitoes. Trade-offs included significant declines in forage plant cover and decreases in amphibian abundance with higher water retention. A decision-support-system (DSS) was developed to integrate (i) retention predicted by the hydrologic model, (ii) biodiversity responses predicted by eco-hydrologic models, and (iii) a user-defined preference scheme to assign importance weights to storage, biodiversity, and implementation cost. The DSS calculated a cumulative score for ranking PES proposals. By considering desirable co-benefits and tradeoffs, stakeholders can decide on their preferred level of services, e.g., buyer(s) may settle for less storage if there is a gain in desirable biodiversity. The DSS can identify trade-offs among services, helping stakeholders negotiate. Multidisciplinary collaboration was required to design, implement, monitor, and assess the NEPES program for trade-offs and co-benefits.

PRESENTER BIO: Dr. Betsey Boughton is the Director of Agroecology at Archbold's Buck Island Ranch. Her research focuses on the sustainability of grazing lands. She has been a collaborator in developing and monitoring the Dispersed Water Management program in the South Florida Water Management District covering over 20,000 acres for 11 years.