



CAPITAL REGION CLIMATE READINESS COLLABORATIVE

Quarterly Adaptation Exchange Notes: Panel Discussion & Participant Discussion

Wednesday, December 13, 2017 | 2:00 – 5:00 PM

UC Davis International Center, Conference Room 3119 | 463 California Avenue, Davis, CA 95616

Panel Discussion: Carbon Farming and Bio-Sequestration

Benjamin Houlton | Professor of Global Environmental Studies, UC Davis

William Horwath | Professor of Soil Biogeochemistry, UC Davis

Campbell Ingram | Executive Officer, Sacramento-San Joaquin Delta Conservancy

Tim Kidman | Project Director, Sustainability and Energy, WSP

Panelist Introductions:

- William Horwath (WH):
 - Study indicated that .6 tons a year go into agricultural lands - we can pull 4 gigatons from carbon in the atmosphere (roughly 9-10 gigatons each year) but it is unlikely we can achieve this globally– based on technical potentials, but practical potential is likely not achievable
 - Researchers see increases of 1-2 tonnes of carbon in the midwest each year
 - Still worth sequestering carbon in soil – significant benefits to agricultural production
- Benjamin Houlton (BH)
 - It is important to work with regional partners, as well as globally, to curb emissions and tackle climate change
 - The biggest challenge is cooperation, not global climate change
 - Fires are eating up mostly all the carbon that has been stored
- Campbell Ingram (CI)
 - Proposition 1 for ecosystem restoration (can fund carbon farming projects)
 - Looking at where restoration fits in the landscape, especially in relation to agriculture – and flood protection, water supply system
 - Carbon managed wetlands are critical
 - Delta has very rich, organic soil, so it already has a lot of organic carbon, but land subsidence is problematic
 - Started working with a large partnership to pull resources together to develop wetland methodology for California (and other coastal wetlands) – to verify quantifications and verify reductions (looking at rice fields and coastal wetlands)
 - Working with public and private landowners along the Delta to implement pilot projects and to incentivize private landowners
 - Working with ARB – considering adopting a protocol for a compliance program if efficacy is demonstrated

- Can now quantify emissions for rice cultivation and coastal wetlands
 - Mosaics – how do we look at rice, managed wetlands, upland habitat, habitat for hunting, agriculture – bring all of these together to consider landscape changes that are climate beneficial
 - They work to bring processes together so that farmers on subsided land would consider the land use changes

Panel Discussion (facilitated and participant Q&A)

- Does ag sector view carbon farming as a credible option?
 - CI: Biggest challenge has been accessing funds to conduct pilot projects
 - Farmers need to see something tangible – often seeing a neighboring farmer benefiting from a new practice before adopting
 - Substantial portion of Delta are publicly owned – real incentive to stop subsidence – hoping to leverage this to demonstrate feasibility and beneficial outcomes to private sector landowners in the region
 - BH: economics don't pan out – even though rice seems to be a good solution, there are economic implications
 - Not many rice varieties that can do well in the Delta (wild rice would have shorter yields, higher value)
 - CI: Looking at maybe \$40 an acre for carbon management in the Delta (voluntary market) – can go up to \$80 per acre if compliance mechanism is adopted
 - Could monetize hunting grounds and water supply
 - Need to get pilot projects up and running
 - Transaction costs can be very high (verification, bundling, etc.) and makes it difficult to find funding for pilot projects
 - ARB wants to see voluntary protocols first, before funding is provided
- The Nature Conservancy worked a lot with farmers on timing and location of flood areas – have there been any investigation on if this approach supports carbon sequestration?
 - CI: No conflict; looking at range of public lands to analyze trade offs from a big picture - create a near term action plan
 - Benefit of working on publicly-owned lands: don't need to convince individual land owners
- Regenerative agriculture program (CSU Chico)- we don't have as much topsoil as we should (partly due to fertilizers and pesticides) – how does regenerative agriculture play into carbon sequestration if soil is not healthy?
 - WH: if you have inputs, soil will become productive – but inputs can lead to environmental degradation
 - To make a “healthy soil”, need to
 - Increase its organic matter
 - Manage carbon
 - No till hasn't been looked at, but consensus is that there are no advantages between till and no till for carbon sequestration
 - Key is increasing soil carbon, not a mitigated approach
- Private property rights, local governments developing open spaces – land-based sequestration as a pillar for the State, but not a lot of guidance of the implications for local governments – how can these tensions be better managed?
 - WH: Need to preserve farmland - one of the best strategies is not converting agricultural lands to developing lands

- Agriculture looks to be able to sequester 5 tons per hectare – if you diligently manage this, you can accomplish this in 5 years
 - 40 million tons CO₂E – technical potential; what farmers could actually achieve is likely less than 10%
 - BH: There are management techniques that we can use – need to develop climate-smart market policies
 - Fire: Because climate in California is changing in favor of grasses rather than trees – need to move towards conserving grasslands (to store carbon underground, can respond to fire quickly, rather than above ground biomass like trees)
 - A lot of benefits to conservation and healthy soils – but can't rely on them too heavily (asking a lot of our natural systems) – if we can cut our global emissions, much more manageable for natural systems to store carbon
 - California is less than 1% of global emissions – we can be a model for the world, but need global action
 - Need to work with landowners to help store carbon in grasslands
 - CI: Delta is a very different environment
 - 9 metric tons of carbon per acre per year coming off of agricultural lands
 - Subsidence fundamentally threatens water system (huge economic driver)
 - Trying to dial incentives – don't want to regulate entire Delta as carbon sink
 - Climate benefits provided by agricultural systems and look at how we can utilize GGRF to move funding to agricultural land conservation (we don't have mechanisms in place to avoid this farmland conversion)
 - WH: Adoption of subsurface drip systems, micro-irrigation systems – almost 100% adoption with tomato growers – eliminate NO_x emissions
 - Industry is becoming climate friendly by adopting new technology and becoming more efficient
 - Regional San – 2,650 acres of natural bufferland
 - Agricultural leases for cattle grazing
 - Green employee education program
 - WH: Key of sequestering carbon is input, which is why the technical potential is so high compared to the practical potential
 - Ongoing management needed to keep carbon in soil once it is sequestered
 - Waste can provide an alternative source of nutrients and keep soil carbon in a steady state
- How can we get elected officials on board?
 - BH: Strategic Growth Council administering \$11 million climate research program
 - We need to start coordinating much better between research, planners, policymakers, etc.
 - CI: strategizing how to work with the legislature to value natural and working lands (these lands don't have large urban centers/populations = less advocates)
- How can we make progress amid competing interests (e.g. affordable housing) and our constant focus on growth and revenue?
 - CI: gets to the big issue of how we control population and create economies that don't need to be sustained by constant growth
 - BH: big opportunity is to look at your own diet – diets with heavy meat intake requires a lot of resources – need to build awareness of where your food comes from
- How are we reaching youth and millennials to encourage behavior change?

- BH: recently created a [video on Vox](#) about this topic - want to educate youth to solve sustainability problems

Participant Table Discussions: Regional Adaptation Priorities

Awareness, Education, Outreach

- Act of educating students on sustainability and climate change, how, activities, what kind of language
- Sacramento region to commit to carbon zero, trying to get a hard target trying to get decision makers to take action. Campaigns to lots of diff decision makers
- UC goal zero waste by 2020, my last trash campaign, online pledge
- CRC create fact sheet to educate stakeholders on climate resiliency
- Invite/ collaborate with elected officials (ACTION)
- Importance of modeling sustainable behavior, share best practices and commit than ask others
- Add youth voice to climate readiness collaborative (ACTIONS)
- Make sure outreach is community specific
- Outreach to diverse groups

Financing and funding

- Financing and funding are different – need funding (which is money) in order to do financing (which is vehicles and structures).
- *Land-use* – monetize ag land use through the offset program.
 - Is there something at the state level under way to do this? To make it worth the while of the local government to preserve agricultural land.
 - Quantify the carbon value of not developing the land, which enables that value to be monetized. Would this generate sufficient funds to be meaningful?
- Davis residents looking at establishing a goal of *ZNE for new construction* – if developers cannot achieve certain ZNE actions, they pay a “penalty fee” or “in lieu fee”, the proceeds of which go into a fund to be used for ZNE or GH reduction in the community generally. Possible to use this not as a tax but as an incentive?
- Other items:
 - Revolving funds within cities (this is financing)
 - Measure A – Bay Area tax (this is funding)
- Michael Papanian prepared a guide to funding to be included in *Resilient by Design*, from grants to taxing on Mello-Roos, geological abatement districts, and other sources and options. Willing to pass along to CRCRC.
- Complex, technical, essential to getting things done, and also fairly foreign to many people – CRCRC do *an in depth tutorial* on this
- Look at every financing decision through a climate lens – apply this at the local level in government decision-making. Green Building policies, Title 24.

Planning and regional coordination

- Actions
 - Regional CAAP template/framework
 - Regional heat island mitigation strategy

- LA County urban heat island plan
 - Regional flooding vulnerability assessment
 - Evacuation plan updates
 - Information clearinghouse of all climate action/adaptation actions in the region
- Strategies
 - Collaborative to provide support through TA for local CAPing
 - Templates etc
 - Broadening focus beyond one sector (water, etc)
 - Co-managing agencies collaborating for groundwater sustainability
 - Yolo county heat-resiliency workshop
 - LARCs AP framework climate
- Issues
 - Heat at regional scale vs, heat islands
 - 30-40% of agencies have CAPs - large gap
 - Collaborating across agencies and projects

Implementation and pilot projects

- Energy storage to meet 100% renewables
 - mercedes , tesla, help w cost
- Low complexity, community projects in DACs
 - composting , local food production, food waste→ soil
 - Transition from fossil with biodiversity
 - Buffers vulnerable communities and depleted resources
 - No good quality local compost
 - Scale up existing neighborhood programs
- SMUD Tree program evolution → carbon focus = more trees and shrubs
- Stormwater capture to increase groundwater recharge and decrease irrigation and energy
- Carbon farming demo