

Restore the Delta
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March 8, 2024

Jennifer Pett-Ridge, Lawrence Livermore National Lab

Subject: Recommendations for Roads to Removal Report education campaign

Dear Dr. Pett-Ridge:

Restore the Delta is a 501c3 research and policy nonprofit committed to restoring the Sacramento-San Joaquin Delta so that communities and ecosystems can thrive together with clean water and air. We are coalition builders, climate and water policy experts, farmers, researchers, and San Joaquin Delta residents tackling deep systemic challenges in our community. For the past 18 years, we've partnered with Delta tribes, farmers, and environmental justice communities to chart a sustainable economic future for the Delta. We envision a Delta region with fishable, swimmable, farmable, and drinkable waters; clean distributed energy resources; regenerative agriculture practices rooted in traditional ecological knowledge; and abundant community wealth building opportunities. Our work finds us in government planning spaces advocating for water quality, flood, and drought protections; out on Delta waterways monitoring water quality and hazardous algal blooms; developing strategies with farmers and landowners to reverse island subsidence; and assessing new climate innovations being proposed in the region for environmental protections and community benefit.

We have traditionally been a resource for Delta communities and policymakers contemplating new research and economic development opportunities relevant to the region (a [recent survey](#) found we are the most trusted organization in the Delta). We are also contracted consultants for state agencies on land use and water planning for just climate transitions. Over the past two years, we've spent hundreds of hours collaborating with Stockton community-based organizations to provide education on critical water quality and quantity concerns. Our curriculum is now expanding to cover carbon dioxide removal and emerging energy industries at the Port of Stockton. Our goal is to support community groups to advocate for themselves for protective standards, transparency and inclusion in economic development projects, and lay the foundation for meaningful community benefits negotiations with industries seeking to do business in the San Joaquin Delta region.

We are writing to extend our congratulations to Lawrence Livermore National Lab on the release of the Roads to Removal report, and to share our takeaways and recommendations to guide follow-on research and continued public education efforts. We were excited to attend the Community and Labor Roundtable and Public Lecture and Symposium at UC Merced on

February 29 and March 1, and we thank you for starting your education campaign in the Central Valley.

Takeaways and recommendations:

- **We agree with the R2R report’s emphasis on prioritizing “well-understood, ecological CDR methods with high environmental co-benefits” for environmentally burdened communities.** The California Central Valley is “one of the most socially vulnerable regions of the United States and thus it is questionable how residents can be engaged in geologic-storage-based CO₂-removal projects from a place of power. This may necessitate locally grown capacity building and, in the near-term, a focus on its outsized co-benefit potential from implementing soil-management practices for carbon storage, which could be a suitable avenue for impactful engagement that rectifies some of the current pollution issues currently” (Ch. 9-45). We wholeheartedly agree, and add that environmental justice communities in the Central Valley should not be the testing ground for carbon removal practices that could increase or maintain air pollution, regardless of whether such practices result in *lifecycle CO₂ reductions*.
- **We recommend conference organizers contract with local translation and interpretation service providers at future events to facilitate a more meaningful two-way exchange.** In California, and the Central Valley especially, Spanish translation and interpretation services are critical for both monolingual and multilingual speakers whose first language is not English. When feasible, prioritize local service providers who can help community members actively engage in discussion, as opposed to just receiving information.
- **Conference organizers and speakers should prioritize listening to community advocates and resist the urge to immediately refute claims (we witnessed this response on a few occasions) that likely necessitate more in-depth follow up discussion.** We respect immensely expertise in science leadership, and believe the science community should respect community expertise equally. Advocates are experts in identifying, assessing, and communicating the needs of communities in multiple arenas, including requirements for a just climate transition. We invite speakers and researchers to consider their tone and body language when responding to local advocates, regardless of the accuracy of the content being conveyed. We urge you to remember that environmental justice advocates are not paid actors, armchair warriors in social media comment sections, or lobbyists trying to sink your cause. We are people whose friends and families are dying early from respiratory conditions, whose children are going to school next to freeways, and whose communities have been made promises repeatedly by government agencies, elected officials, and industry leaders for improved living conditions that never

seem to materialize. It is incumbent on researchers and technical experts to meet community advocates where they are, recognize their power and privilege, and exercise patience and grace for diverse perspectives that may not always be aligned. Trust that this upfront emotional labor will pay off.

- **Carbon removal start-up companies in the audience were given significant deference to periodically weigh in on panel discussions at the symposium.** This was not a balanced approach for representing local environmental justice and labor perspectives. If the goal is to introduce interested project developers to prospective host communities, we recommend prioritizing methods that avoid disproportionately favoring industry perspectives and inadvertently pressuring community advocates to engage with potential projects on short notice.
- **More air time needed for community and labor advocates and social scientists.** We appreciate that the UC Merced Community and Labor Center hosted a smaller roundtable prior to the larger public lecture and symposium to allow for a more intimate two-way exchange between researchers and community-based organizations about the report findings and place-based implications. We recommend this continue as a common practice, and that agendas are sent further in advance. We also appreciated the symposium’s EEEJ panel, which featured area social science experts, labor personnel, and a community advocate based in Kern County, who highlighted that at least one company planning CCS and CDR projects in the San Joaquin Valley still hasn’t abated its methane emissions from oil and gas wells.
- **At the symposium, the panel that covered forest biomass carbon removal lacked place-based and subject matter expertise from tribal representatives, fire ecologists, and foresters, and assessment of potential transportation impacts in Central Valley communities.**
 - **For forest and foothills communities:** We recommend future education efforts give more weight to R2R’s finding that “forest-management strategies should be place-based, flexible, and locally led and account for the other forest benefits or potential adverse impacts” (Ch 2-1). We also recommend prioritizing tribes, fire ecologists, foresters, and some of the numerous [prescribed burning associations](#) that have emerged in California for forest carbon removal panels. Symposium presenters described Western United States forest management practices as mechanical thinning and prescribed burning, however, the roles, synergies, and history of those practices under different conditions were not detailed. We recommend emphasizing R2R’s finding that “our best method to reduce fuel loads—and thus foster healthier forests that lose less CO₂ to wildfire—is a

combination of thinning and intentional burning” (Ch2-23). Other potentially useful education strategies include making clear commitments to respecting and prioritizing traditional ecological knowledge in forest restoration and wildfire mitigation projects, acknowledging the inherent nature of California landscapes as fire-adapted ecosystems, and clarifying the difference between clear cutting practices and ecologically restorative forest treatments.

We also found it difficult to ascertain whether forest management practices were being described as *carbon removal* (whereby captured biogenic CO₂ is stored underground or as durable soil amendments) and/or *avoided emissions* (from reducing wildfire risk and open-air pile burning, particularly in California forests), which we believe are important distinctions. While there may be enormous quantities of forest residues to be removed to the benefit of communities across the state, we recommend exercising caution to ensure proposed technology solutions remain in step with objectives to reduce wildfire risk, improve ecological and public health outcomes, and generate community wealth in forested communities.

- **For valley communities:** Impacts of transporting 1) captured CO₂ streams from wood gasification facilities to geologic storage sites and 2) woody biomass feedstocks from Sierra forests, are major concerns for communities in the North San Joaquin Valley, which is part of an air basin that has been [out of compliance with federal air quality standards for decades](#). For local context, we are deeply concerned with current plans for the Port of Stockton to become a wood pellet terminal sourcing woody biomass from Sierra forests, which could increase air pollution from diesel trucking and oceangoing vessels. As you continue educating communities about the potential of biomass feedstocks, we recommend providing examples to help distinguish common sense, locally scaled forest carbon removal from traded sector plays to ship wood pellets across the world to be combusted for energy generation. We also urge you to consider the need for air pollution reduction measures in combination with reducing CO₂ emissions.

On BiCRS opportunities more generally, R2R highlighted that traditional biomass management practices – particularly manure storage and reuse at concentrated animal feeding operations (CAFOs) and burning of woody orchard and vineyard wastes – have historically been major pollution sources in communities across the San Joaquin Valley. With the state-mandated [phase-out of agricultural burning and efforts to divert organic waste from landfills](#) to prevent methane emissions, emerging alternative pathways for biomass need to be thoroughly evaluated for

environmental and public health impacts. We do not doubt the relative CO₂ avoidance and removal potential of strategies to collect, transport, and convert various types of biomass to fuels, chemicals, and long-lived products when compared to current practices (eg letting organic waste decompose in landfills, leaving slash in the forest to rot – whether untouched or as chipped mulch – or burning it, etc.). That said, we recommend future public education efforts provide more detail on methods used to compare life cycle CO₂ reductions and tradeoffs of alternative end uses to current practices – in other words, provide transparency around how counterfactuals (eg pile burning) are chosen for life cycle assessments and the conditions under which counterfactuals are likely to change in the future (eg when do we stop counting “avoided emissions” from *not burning* agricultural residues?). For pathways involving hydrogen production, we recommend taking a conservative approach to not overestimate CO₂ avoidance potential without having detailed analysis of potential end uses and leakage implications. Lastly, due to the considerable geographic overlaps with forest biomass removal strategies, we recommend public education and capacity building efforts bring tribal, forest, foothills, and valley communities together to better understand each other’s experiences.

- **The R2R report lacked analysis on soil carbon sequestration opportunities that are relevant to California, the Central Valley, and the San Joaquin Delta, specifically.** R2R emphasized switchgrass as a perennial carbon crop to replace corn ethanol feedstocks, which may be a promising solution for communities in the Midwest, but does little to solve water, climate, and food security challenges in California. Additionally, limiting cover crop benefits analysis to the top 6 row crops in the United States left out the vast majority of crops *currently grown* in the Central Valley, as well as *potential future crops* that may be planted to adapt to regional climate impacts. For the Delta region, we should be prioritizing cover crops that have good salinity, flood, and drought tolerance; reverse subsidence; and are timing-aligned with cash crops that can reverse subsidence (e.g. rice). More generally, we caution researchers to not overemphasize carbon sequestration as the main objective for agricultural and land management practices, particularly given the challenges with measuring and valuing soil carbon benefits. Establishing CO₂ flux baselines in the Delta, specifically, is challenging, due to significant variability associated in part with seasonal variation in land saturation, which will increase over time as sea levels rise.

We were also concerned to hear panel researchers and industry representatives generally endorse perennial orchard crops as an effective carbon removal solution, despite major water availability challenges and groundwater regulations that will reduce the baseline

carbon storage potential of water-intensive nut crops grown in the Central Valley today. We appreciated the emphasis from one panel presenter on regenerative agriculture practices to support microbial communities in soils; we recommend that future education efforts establish soil health principles earlier in the conversation.

- **More historic context needed to inform local CDR strategies.** R2R offered an exciting framework to continue building on for studying carbon removal opportunities on a county-by-county basis (the EEEJ section, in particular, was phenomenal). We appreciate that farmland ownership inequities were briefly referenced at the symposium, and we implore future outreach to give more attention to the demographic makeup of large landowners and the historical exploitation of farmworkers, environmental pollution, and other negative externalities (eg contaminated and dried wells, inequitable water rate structures, etc.) associated with industrial agriculture practices in the Central Valley. Without confronting these issues, research and communications efforts risk overemphasizing inequitable solutions for problems rooted in historical inequity, rather than helping communities take ownership over local carbon removal solutions.
- **Community advocates at the symposium raised concerns about the report's emphasis on Direct Air Capture as a primary carbon removal approach, despite its intensive energy requirements and early stage of technology development.** We are not categorically opposed to DAC, if powered by renewable energy. Additionally, we recognize that CO₂ removal at a DAC facility is much easier to measure than other CDR approaches R2R alluded to but did not analyze in depth (e.g. enhanced weathering, peatland and coastal wetland restoration, blue carbon management, ocean alkalinity enhancement, and ocean iron fertilization). That said, we recommend future education efforts offer guiding principles for advancing area decarbonization in tandem with DAC, since its utility as a residual emissions backstop is predicated on deep emissions cuts we've yet to achieve.

For local context, we believe it would be counterintuitive to build an energy-intensive DAC industry next to communities living with energy insecurity, pollution, extreme climate threats, and poor housing conditions without addressing these challenges together. Consider the example of South Stockton – a formerly redlined environmental justice community adjacent to several early stage carbon removal projects. To enable electrification of homes and businesses, much of the distribution grid in South Stockton would need to be upgraded to accommodate both new energy demand (e.g. transport and buildings running on electricity) and new clean energy resources (e.g. solar and battery storage), based on PG&E's Integration Capacity Analysis Map. Collectively, project developers, public institutions, and utilities share a responsibility to rectify unacceptable

environmental and socioeconomic conditions in disinvested communities that have been caused by centuries of systemic racism, fossil fuel pollution, and negligence to develop and maintain vital water and energy infrastructure. We recommend local carbon removal and decarbonization efforts work in lockstep to achieve shared climate, equity, and pollution reduction goals.

We did learn a great deal at this event and from the report, and we appreciate all the work such high level reports and conferences entail. We offer our comments in the spirit of collegiality, as government entities have a steep learning curve to work with communities, just as environmental justice communities have a steep learning curve to evaluate carbon removal strategies.

Sincerely,

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