

NW Biochar Working Group

Recommendations for Short and Long Term Actions

November 19, 2012

- Agriculture
- Biomass/Organics Recycling
- Forestry
- Stormwater
- Ecosystems Services



Agriculture: Short Term Actions

- **Identify environmental problems** in agriculture that specialized/customized chars may be able to address, e.g. Chesapeake Bay poultry runoff management, odor control in manure, reduce soil N₂O emissions
- Develop a **list** of agricultural **feedstocks** where producing biochar on site could solve an environmental problem and also where heat is already needed; e.g. hops, mint oil; the heat utilization could be the critical economic link
- **Identify** places (geographical proximity) where **synergistic opportunities** exist to add biochar production (e.g. link an anaerobic digester, greenhouse, and biochar; pyrolysis heat goes to greenhouse, biochar goes to container mix and nutrient recovery from digester effluent, etc.). Might be an opportunity in the Mt Vernon area – dairies, flower greenhouses
 - NRCS CIG grant opportunity? Would need to be the national level funding to be a large enough grant

Agriculture: Long Term Actions

- Demonstration of **closed-loop system** (energy and nutrients) in dairy or poultry industry (Ohio has project underway)
 - Idaho, Westpoint Seattle digester, Farm power
- Develop greater understanding of **biochar characteristics** (effects of biochar aging, feedstock, process, particle size and post-production handling). Be able to generally understand what types of biochar elicit what sorts of responses.
- Develop actual **end use specifications** for different biochars similar to what the compost industry has done.

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Markets and Priority Projects: Agriculture

- Displace vermiculite and peat in greenhouses



15% char
+ alfalfa



50% compo-
char + bark



- Correct soil condition or improve produce quality in production agriculture

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Biomass/Organics: Short Term Actions

- **Inventory** biochar industry and markets to identify current efforts and specific needs
- Build **public/private partnerships** to drive R&D efforts: expand field trials to prove long-term efficacy, develop regulatory approval, and adopt BMP requirements to support markets
- Informal **advisory group** to guide business planning (support through Extension?)
- Douglas fir **bark char for stormwater**, including field trials in Puyallup
- **Nutrient** capture (nitrates, phosphates)
- **Activated carbon** for filtration, e.g. Biogenic Reagents in Fife (feedstocks unknown)

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Biomass/Organics: Long Term Actions

- Only other source of predictable feedstock volumes, pricing and characteristics appears to be various forms of **mill waste**
- Need to **identify process technologies** and **off-takes** for char from inconsistent woody feedstocks, e.g. bioenergy facilities primarily producing syngas/biocrude
- **Priority Projects:**
 - Recover wood waste to CHP, fuel and char
 - Use char to treat stormwater

Stormwater: Short Term Actions

- Incorporate biochar (organic matter) in existing **erosion control**, site **restoration** and **remediation** projects.
- Sell biochar to **industrial stormwater** sites,
 - Demonstrate uses
 - Monitor results
- Laboratory studies of removal – **column tests** for Total Cu, Zn
- Fund **collaborative monitoring and research** (e.g. WSU Puyallup, TAPE)
- Identify **collaborators** - companies, City, State, Fed, ports
- Develop **temporary special provision** (WASHDOT), and general specifications to include biochar.

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Stormwater: Long Term Actions

- **Low Impact Development (LID)** facilities or structures which requires approval through demonstration and testing projects (TAPE, BMP).
- Compare compost with biochar in **column studies**. These activities are begun at WSU, Puyallup's Bioretention stormwater testing facility. Multiyear testing is needed. Funding (\$200K-\$250K) is needed to fully build out the testing of biochar in these stormwater applications.
- Identify **remediation** demonstration projects with municipal, county and port district staff. Funding by collaboration with state and federal sources.
- **Networking** with groups like Washington Organics Recycling Council, US Compost Council or other compost organizations, and organics support organizations to build collaboration and field use opportunities.

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Stormwater: Markets and Priority Projects

- Use char for industrial **roof drains** (Port of Vancouver, Tacoma)



- Use char as organics (<35%) of media for bioswales(WA DOT)
- Work with agencies to adopt standard methods
- WSU Puyallup Bioretention Trials (3 year)



- Elwha River Valley Restoration Project

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Forestry: Short Term Actions



- In forest opportunities:
 - **water filtration** on road systems,
 - biochar in **wattles**,
 - **seed coating** to improve post fire re-establishment,
 - **wildlife food** plots for improving soils and food productivity,
 - restoring **skid trails**
 - **re-establishing** forest on road surfaces.
- Biochar with chitosan is already used in Baker tank filters.
- Hydraulically applied for burned area recovery. But re-seeding products need to be certified by USDA which is in testing.
- Review and improve performance of biochar in these settings.

Forestry: Long Term Actions

- Make char for fuel reduction
- Mobile pyrolysis units for in-the-woods processing. Transportable units add complexity, but a scale unit should be built and tested.
- Couple pyrolysis with timber harvest. WA DNR noted that they will provide lead actions in the group.



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Forestry: Markets and Priority Projects

- Integrate char into logging practices
- Apply char to field sites with debris piles for soils reforestation and/or stream side



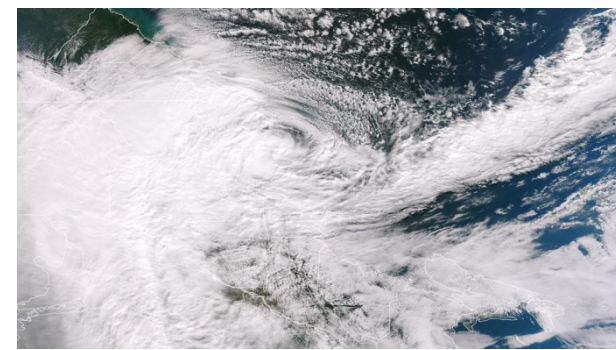
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Ecosystem Services – Opportunities and Challenges for carbon, sustainability, wildlife, climate.

Ecosystem services “benefits that human communities enjoy as a result of natural processes and biological diversity.” Ecological values are defined as “**clean air, clean and abundant water, fish and wildlife habitat and other values that are generally considered public goods.**” (OR)

Ecosystem services market is *“a system in which providers of ecosystem services can access financing to protect, restore and maintain ecological values, including the full spectrum of regulatory, quasi-regulatory, and voluntary markets.”* (OR)

Biochar Products: carbon offsets; monetized carbon benefits, carbon sequestration, sustainability, impact investing, potential brokers, buyers, policy support.



Hurricane Sandy Approach - NOAA



Ecosystem Services: Markets and Priority Projects

- Develop a **carbon market** and trading value **mechanism**
- Develop a broadly accepted **LCA** for business case
- Integrate biochar into existing **compost** industry

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