

# Biochar:Policy & Competition

Ron Larson  
OLLI - May 15, 2017

# Why Biochar For Me?

## **A. RE Emphasis (20 years)**

1973 - Congress (policy, assessment)

1977 - SERI (now NREL - July 13 Anniversary)

1982 - USAID (Sudan)

[1984 lightning/modeling; RE activities on side]

1990 - Earth Day - climate efforts, GED (NECO)

## **B. Charcoal Stove Emphasis (12 years)**

1993 - retirement - charcoal-making starts

1995 - started new stove list [also CRES/ASES]

2000 - stove conference in India

## **C. Biochar Emphasis (12 years)**

2005 - started biochar list

2007 - first biochar conference (Australia)

2009 - Boulder biochar conference

2012 - Geoengineering & policy emphasis began

## Main Climate Points/Messages

Topic: We need CDR - more than mitigation/adaptation

Competition: SRM is the controversial part of “Geo”  
Wind and solar are non-competing

Progress: US backing out of IPCC **IS** harmful  
California will be key (especially with biochar)  
International efforts won't stop

To help: Keep climate messages alive.

# **Main Biochar Points/Messages**

- Topic: Simple basic idea.  
Complex in details, won't work everywhere.

Competition: BECCS: fails on soils/costs/size  
DAC: fails on costs  
Afforestation: fails on soils

Progress: Only fair; no real \$ support yet.  
New areas take time.

To help: Gardeners can experiment  
Keep climate & CDR message alive

# Biochar “Expert” Activities

For most:

selling, using, research  
understanding different soils, chars, species, foods

For me:

climate, energy  
competing CDR approaches: BECCS, burial, DAC.....  
looking for supporters: Al Gore, Bill McKibben, James Lovelock, Ji  
and especially detractors: Biofuel Watch, ETC....

# Different Aspects of Biochar

Production: “Large” scale - probably < 25 MW

several truck loads chips per day

“Medium” - (100 kW) a truckload per week

“Small” - 1 (stoves) to 100 kg per batch

Cogen? Thermal loads, Liquids (Cool Planet)?

Into Soil: 10 tonnes/hectare (1 kg/sqm); or much less?

prep needed first - a bottleneck ?

Terra Preta; how much after?

Policy: Quantifying benefits (not infinite life); models

Land grabbing (palm oil precedent); ethics

Albedo, food, biodiversity, limited area?

Stored energy (backup to wind/solar)

Ocean (“blue” biochar)

## Numbers for models

1 ppm CO<sub>2</sub> = 2.12 Gt C

Fossil, atmosphere, biomass, soils, oceans

Stocks (X1, 800, 600, 2000, X2) Gt C

Net flows now (-9, +5, -1, 2, 3) Gt C/yr

Future Flows (0, -4, 1, 5, -2) Gt C/yr

photosynthesis (CO<sub>2</sub>+H<sub>2</sub>O + solar >> C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>+ O<sub>2</sub>)

Trees .. Shrubs (eucalyptus, miscanthus, sugar cane,...)

pastures, enteric methane release (albedo)

Rainfall causation (Amazon concern)

Ocean acidification (heating, coral bleaching)

Ten Random/Current/Recent Topics



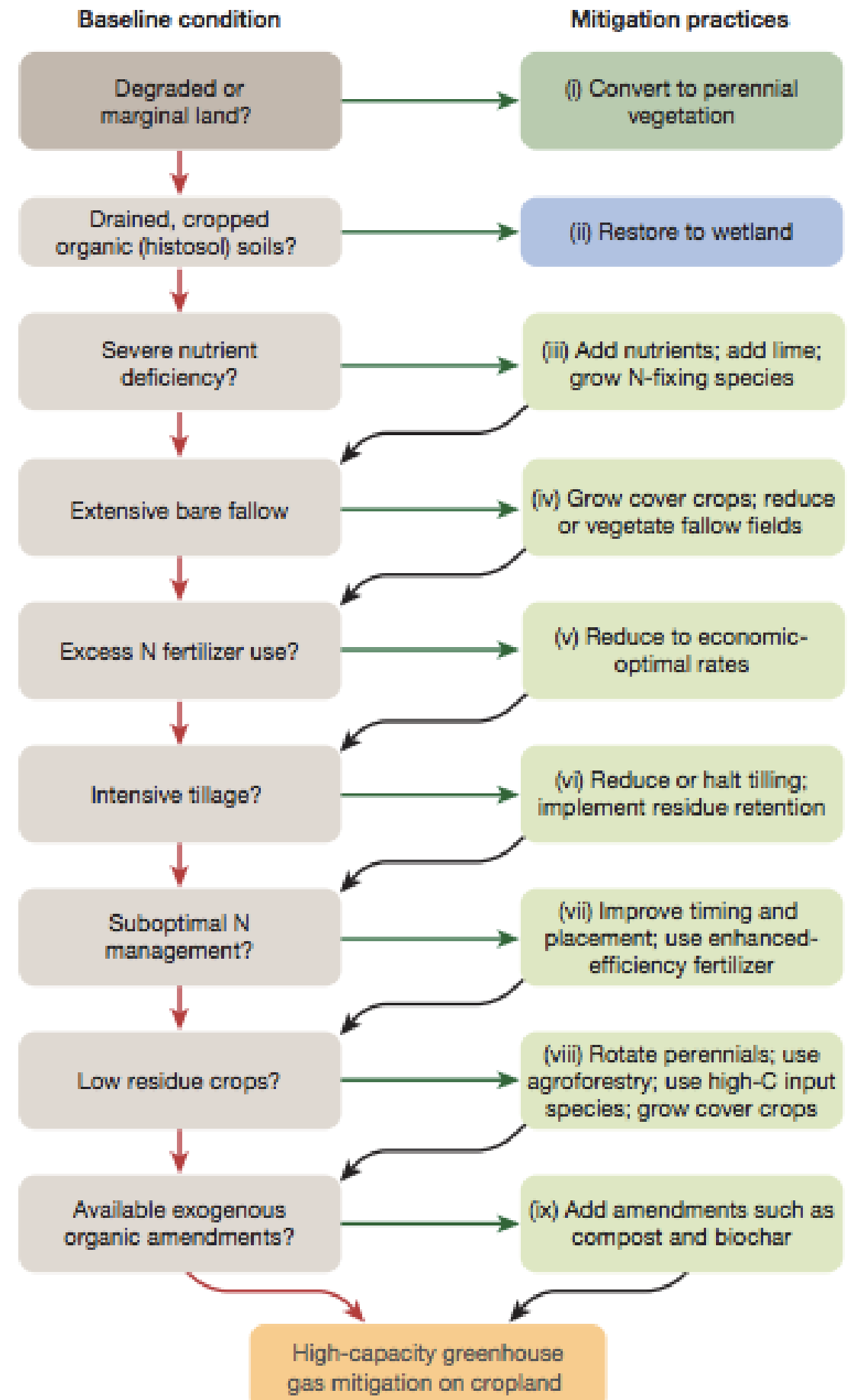
# PERSPECTIVE

## Climate-smart soils

Keith Paustian<sup>1,2</sup>, Johannes Lehmann<sup>3</sup>, Stephen Ogle<sup>2,4</sup>, David I

Reay<sup>5</sup>, G. Philip Robertson<sup>6</sup> & Pete Smith<sup>7</sup>

### RESEARCH PERSPECTIVE



Next slide from

**PERSPECTIVE** | CLIMATE CHANGE

## The trouble with negative emissions

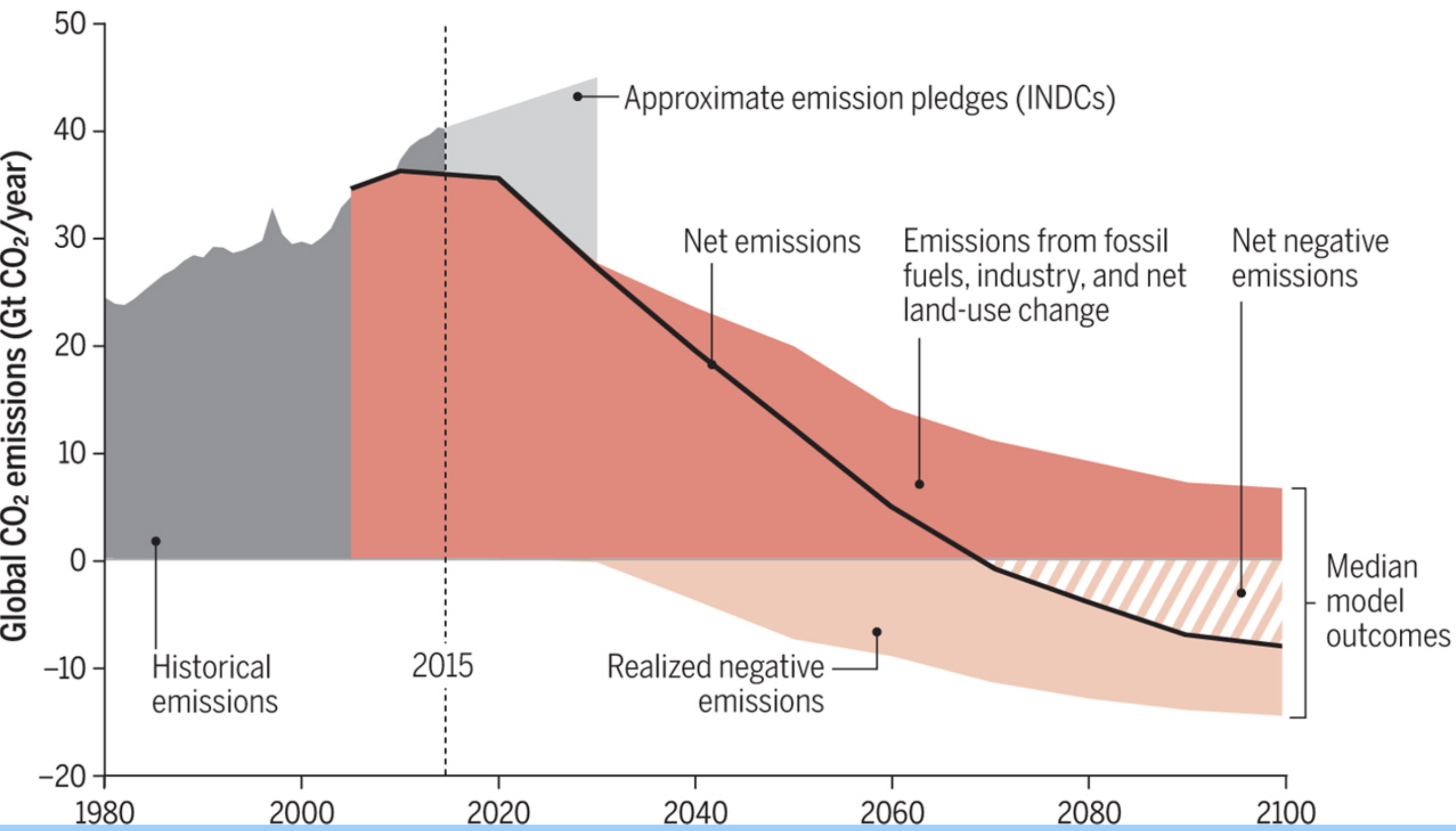
Kevin Anderson<sup>1,2</sup>, Glen Peters<sup>3</sup>

**+** See all authors and affiliations

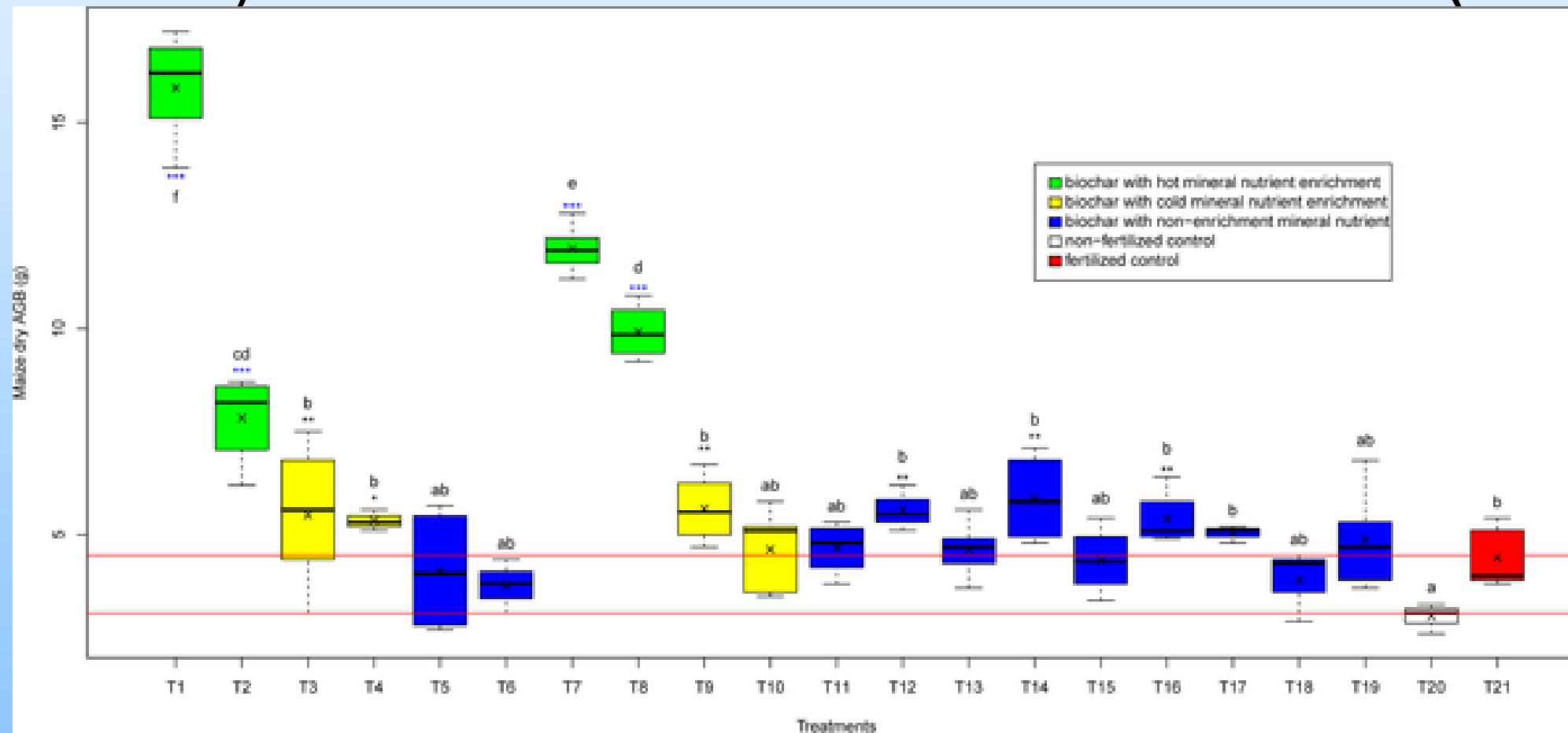
*Science* 14 Oct 2016:  
Vol. 354, Issue 6309, pp. 182-183  
DOI: 10.1126/science.aah4567

# No quick fixes

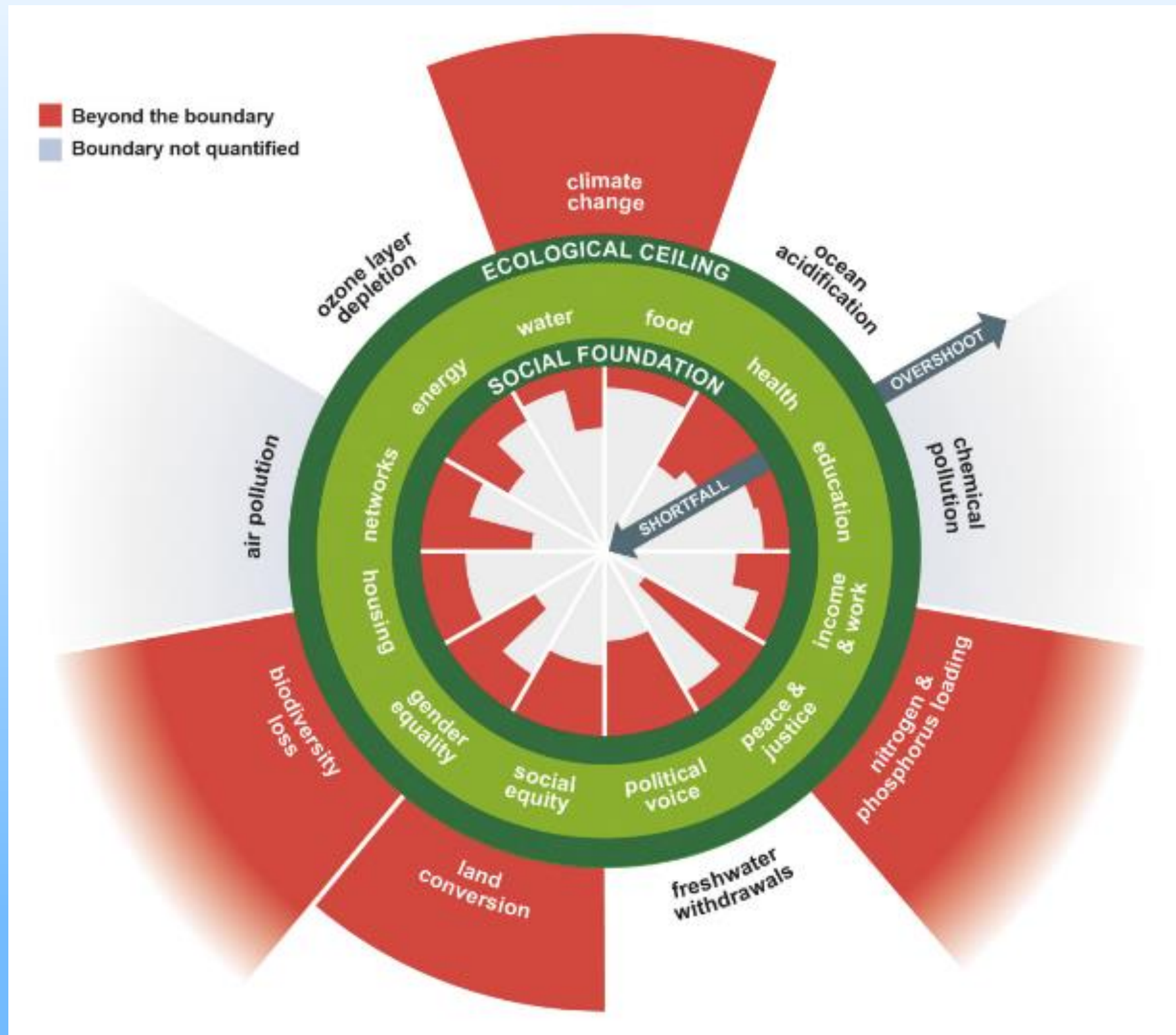
Modelers generally report net carbon emissions, unintentionally hiding the scale of negative emissions. Separating out the positive CO<sub>2</sub> emissions from fossil fuel combustion, industry, and land-use change reveals the scale of negative CO<sub>2</sub> emissions in the model scenarios (16). INDCs, Intended Nationally Determined Contributions.



**Fig 2. Effect of biochar amended soils produced from different kiln and enriched and non-enriched in various ways with 1 and 4% biochar dosages (19 levels; T1, T2...T19) vs fertilized and non-fertilized control treatments (2 levels; T20 and T21)**

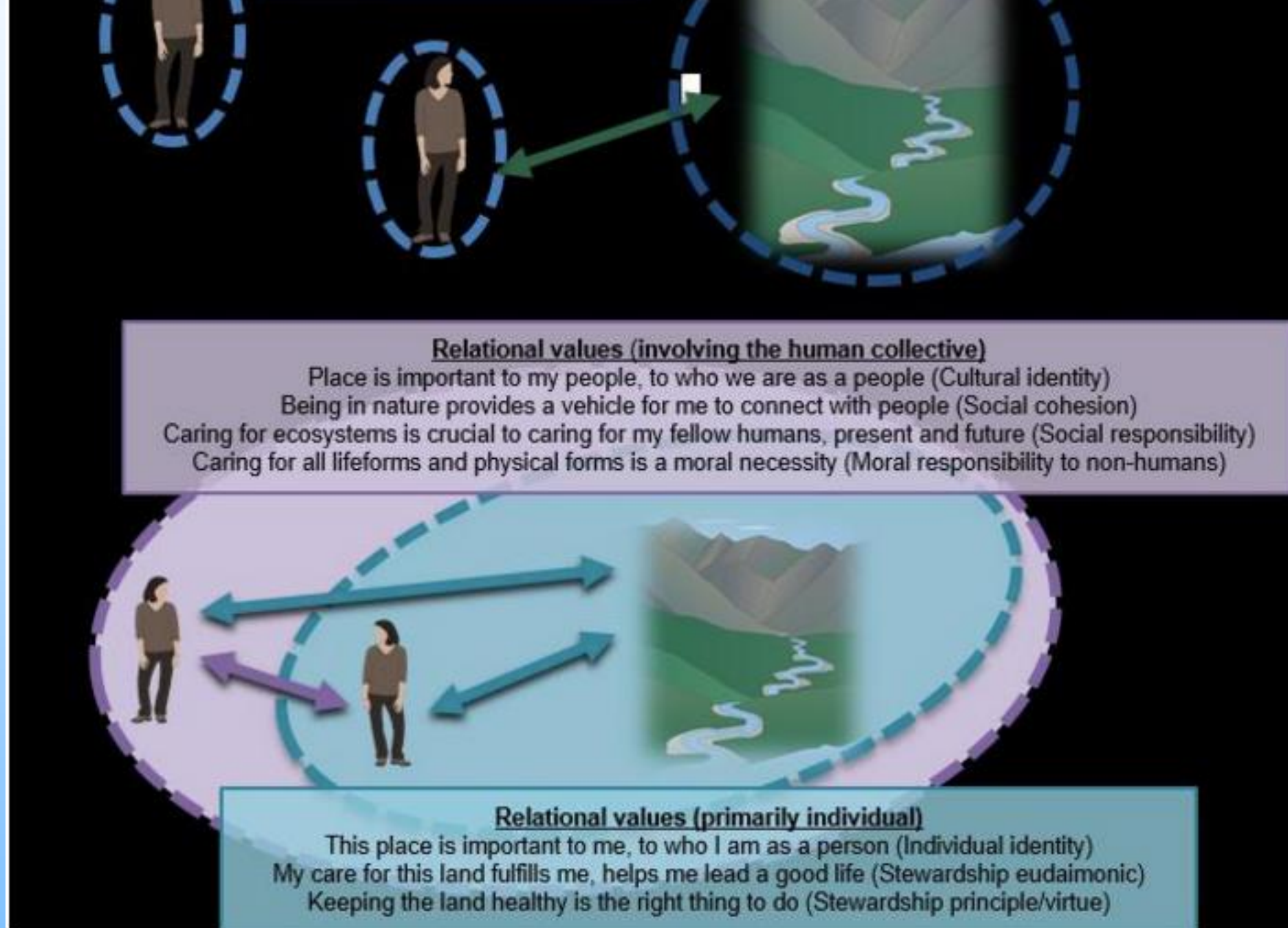


Pandit NR, Mulder J, Hale SE, Schmidt HP, Cornelissen G (2017) Biochar from "Kon Tiki" flame curtain and other kilns: Effects of nutrient enrichment and kiln type on crop yield and soil chemistry. PLOS ONE 12(4): e0176378.  
<https://doi.org/10.1371/journal.pone.0176378>  
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0176378>



[https://www.weforum.org/agenda/2017/04/the-new-economic-model-that-could-end-inequality-doughnut?utm\\_content=bufferd339b&utm\\_medium=social&utm\\_source=facebook.com&utm\\_campaign=buffer](https://www.weforum.org/agenda/2017/04/the-new-economic-model-that-could-end-inequality-doughnut?utm_content=bufferd339b&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer)



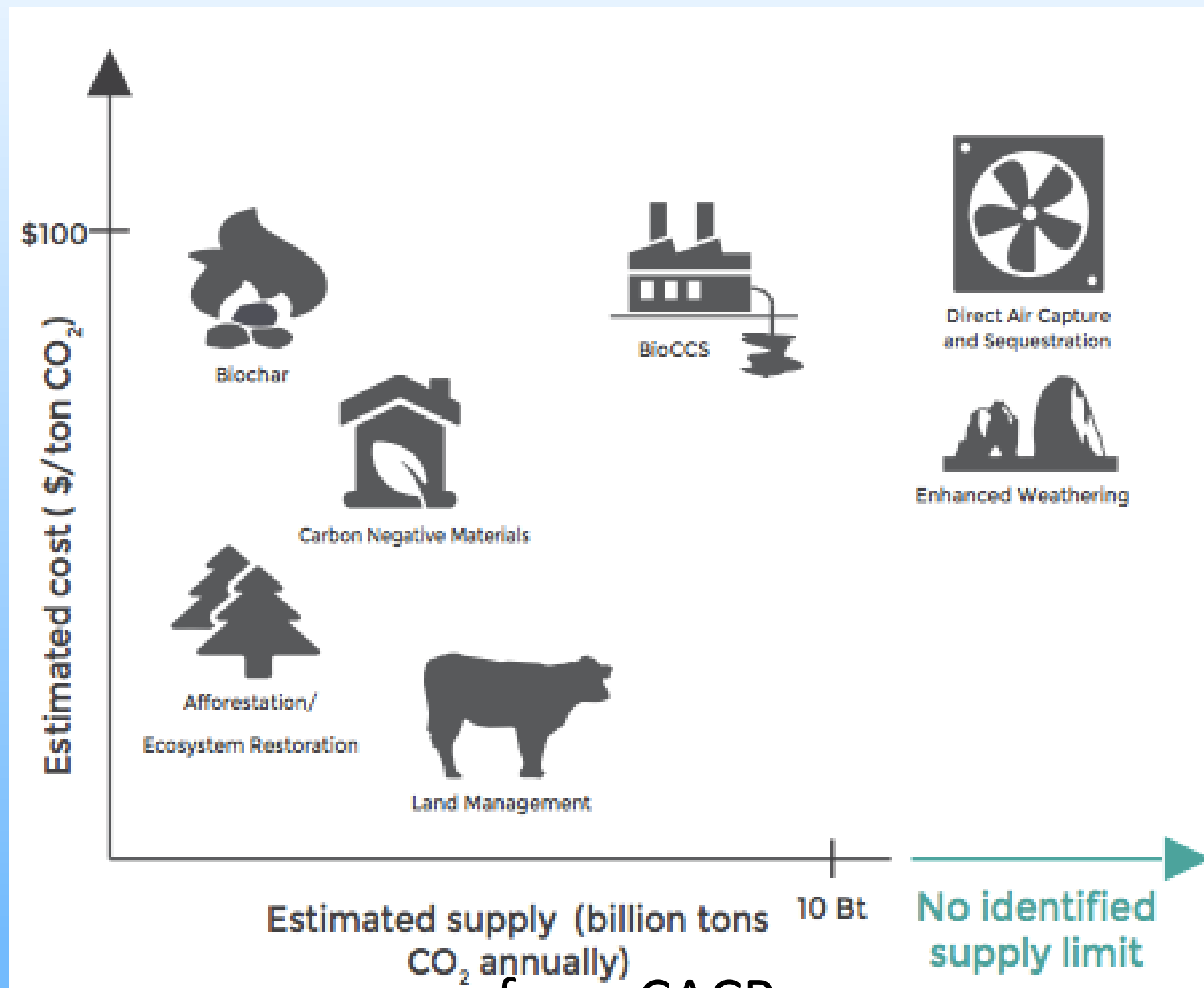


### **Relational values involving the human collective**

- Place is important to my people, to who we are as a people (Cultural identity)
- Being in nature provides a vehicle for me to connect with people (Social cohesion)
- Caring for ecosystems is crucial to caring for my fellow humans, present and future (Social responsibility)
- Caring for all lifeforms and physical forms is a moral necessity (Moral responsibility to non-humans)

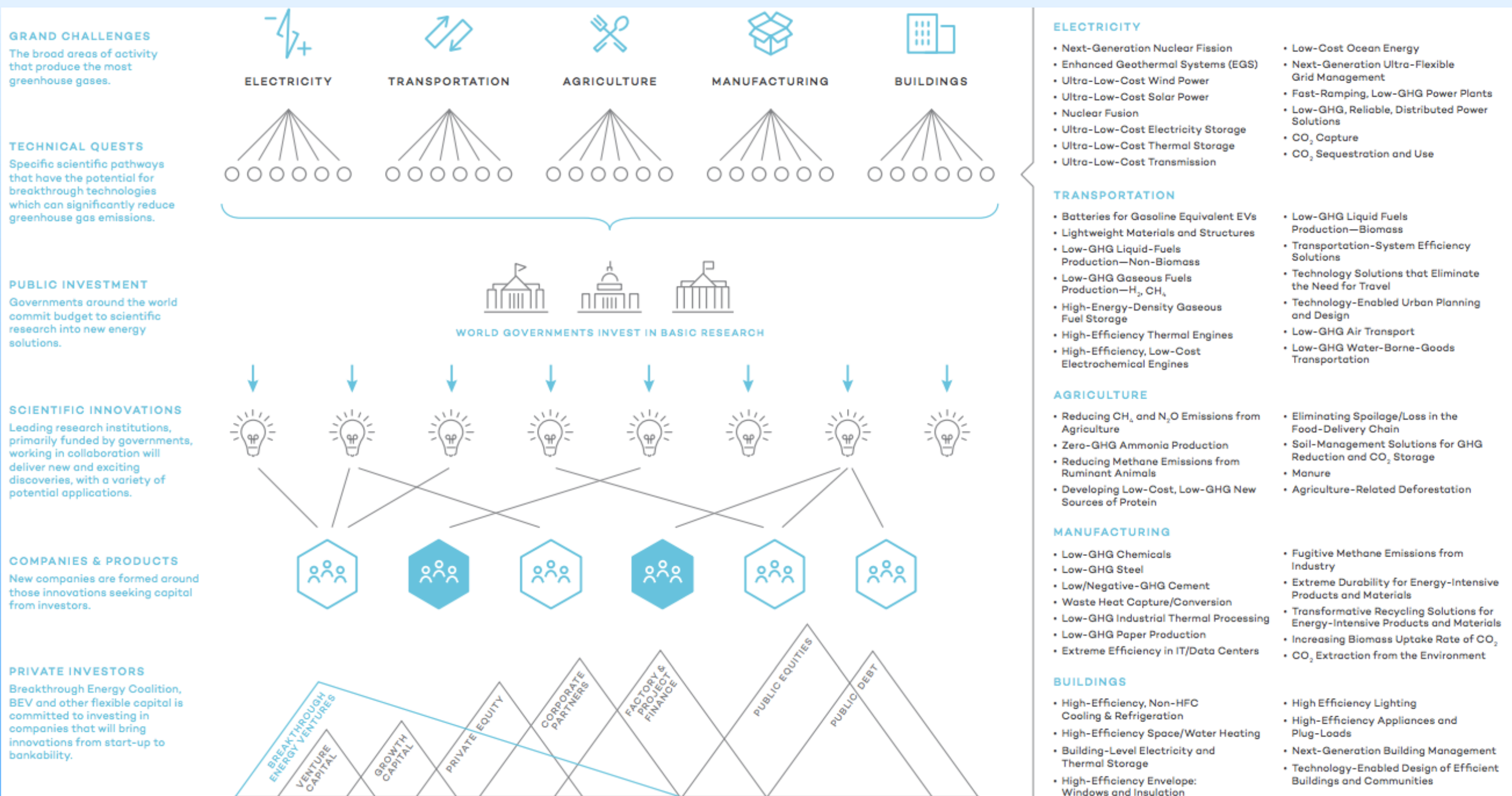
### **Relational values primarily individual**

- This place is important to me, to whom I am as a person (Individual identity)
- My care for this land fulfills me, helps me lead a good life (Stewardship eudaemonic)
- Keeping the land healthy is the right thing to do (Stewardship principal/virtue)



from CACR:

<https://static1.squarespace.com/static/54a2e4c1e4b043bf83114773/t/55bbe7cce4b07309dc53aa8c/1440188534251/Carbon+Removal+Fact+Sheet%28online%29.pdf>



[http://www.b-t.energy/wp-content/uploads/2016/10/BreakthroughEnergyCoalition\\_Landscape.pdf](http://www.b-t.energy/wp-content/uploads/2016/10/BreakthroughEnergyCoalition_Landscape.pdf)



## **Ethics as a final topic**

### **Intrinsic value**

Nature has value  
independent of people

### **Instrumental value**

Being In / seeing nature brings  
people pleasure or satisfaction

# **Four Favorite Websites**



INTERNATIONAL POLICY | 11 May 2017 © 16:00

# Mapped: Climate change laws around the world



Lady Justice on top of Old Bailey Credit: \_ultraforma\_ iStock / Getty Images Plus



**SIMON EVANS**

11.05.2017 | 4:00pm

INTERNATIONAL POLICY

Mapped: Climate change laws around the world



There has been a 20-fold increase in the number of global

climate laws since 1997, according to a new



#### Sign Up For Email Updates

Enter your email address:

Sign Up



Follow IBI

#### Business Members



#### Organization Members



Biochar  
Certification

Help Put the Earth Back in the Black: Become an IBI Member [find out more >>](#)

[About IBI](#) [IBI Programs](#) [Connect](#) [Learn](#) [Resources](#) [News](#) [Contact Us](#) [Donate](#) [Join](#)

Search this site:

Search

## IBI Educational Webinar Series: Biochar Building Materials & Composites



**REGISTER NOW FOR THE IBI WEBINAR:**  
**Biochar Building Materials & Composites**  
May 23, 2017 • 5:00 - 6:30 pm EDT

Learn about carbonized biomass in building materials and other composites

## biochar UPDATES

[2nd China-Asian Workshop on Biochar Production and Application for Green Agriculture-from Technology to Viable Systems \(Jinhua, China\) Nov 18-21, 2017](#)

05/10/2017

By: Tom Miles

[IBI Educational Webinar Series: Biochar Building Materials & Composites](#)

05/03/2017

By: Brian Schorr

[April 2017 IBI Newsletter](#)

04/28/2017

By: Brian Schorr

[IBI Educational Webinar Series: Sewage Sludge & Biochar](#)

04/04/2017

By: Brian Schorr

[March 2017 IBI Newsletter](#)

03/31/2017

By: Brian Schorr





Building the Future from the Ground Up

Search



Home

About us

Biochar Information

News

Contact

2016 Biochar Symposium!

We're all anxious for the **Fifth North American Biochar Symposium!**

# Agricultural Applications

with climate implications

[VIEW MORE](#)

## US Biochar Initiative

### Building the Future from the Ground Up

A not-for-profit organization promoting the sustainable production and use of biochar through research, policy, technology and doing it!

© 2016 USBI. All rights reserved.

## Contact USBI

US Biochar Initiative

Building the Future from the Ground Up  
1470 SW Woodward Way  
Portland, OR 97225 USA

📞 503-780-8185

✉ [ask\\_us@biochar-us.org](mailto:ask_us@biochar-us.org)

## Conference Sessions

- Agriculture & Horticulture
- Forestry & Biomass
- Plenary & Workshops
- Policy & Production
- Stormwater & Remediation





Search for messages



Groups

NEW TOPIC



Mark all as read

Filters ▾



geoengineering Shared publicly

30 of 6490 topics (99+ unread) ☆

Manage · About ▾

Welcome to the Geoengineering Google Group. Please feel free to post your papers, thoughts, opinions and any relevant information you've found online. Discussion should be at least at the level of the letters page of Scientific American or NewScientist magazine - i.e. legible to the general reader, but well-informed, accurate and polite. References are strongly encouraged.

Discussions are lightly moderated, so please ensure that you keep to list standards without relying on any filtering or moderation.

You can set your delivery frequency, so if the emails are getting a bit much don't opt out - just switch to daily or weekly summaries.

You can unsubscribe at any time. If you try and fail to unsubscribe, you're probably trying to use the wrong email address.

Any problems, email me.

Thanks

Andrew Lockley  
Moderator



**Climate Engineering Newsletter for week 20 of 2017** (1)

By in...@climate-engineering.eu - 1 post - 0 views

5:58 AM



**Scientists Consider Brighter Clouds to Preserve the Great Barrier Reef** (17)

By CE News - 17 posts - 48 views

May 13



**Restoring the carbon balance webinar summary** (1)

By Christophe Jospe - 1 post - 3 views

May 12



**Re: [geo] Digest for geoengi...@googlegroups.com - 18 updates in 9 topics** (1)

By Crutzen, Paul - 1 post - 4 views

May 12



**Molecular Diversity of Sea Spray Aerosol Particles: Impact of Ocean Biology on Particle Composition and Hygroscopicity — ScienceDirect** (1)

By Andrew Lockley - 1 post - 3 views

May 11



**"Alaska's thawing soils are unleashing a crapload of CO2"** (1)

By Greg Rau - 1 post - 4 views

May 11



**etc\_hbf\_geobriefing\_may2017.pdf** (9)

By Andrew Lockley - 9 posts - 10 views

May 11