

## ***Interactive comment on “Young People’s Burden: Requirement of Negative CO<sub>2</sub> Emissions” by James Hansen et al.***

**E. J. Knight**

erichjknight@gmail.com

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Soil Biology is our only way to rapidly and massively draw down CO<sub>2</sub> from the air to offset our ongoing and past carbon emissions, It Can safely and naturally restore the hydrological cycles by increasing biogenic aerosols and cloud albedo that can readily cool the planet by the 3 watts/m<sup>2</sup> needed to offset the now locked in greenhouse warming effects and avoid the Storms of Our Grandchildren.

The French have lead the way recognizing Soil Carbons’ value and committing to build Soil Carbon by 0.40% annually. Putting them on the road to Carbon Negativity before any industrialized country. 25 nations have signed on to 4p1000. 100 of the 196 countries in Paris submitted plans to reduce CO<sub>2</sub> via agriculture, forestry and replacing soil carbon into their programmes. <http://4p1000.org/understand>

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A combination of Best Management Practices, (BMPs), for Agriculture, Grazing & Forestry with bioenergy systems which build soil carbon can deliver the giga-tons of carbon necessary into the soil sink bank.

Ag BMPs; 1 GtC, New Forest & BMPs; 1 GtC Pyrolytic Bioenergy, Cooking Stoves; nearly 1/2 GtC Industrial Pyrolytic Bioenergy; 2 GtC Holistic Grazing; 2+ GtC

Over 6 GtC, So soils & biota can do more than half the 10 GtC reduction job, feeding carbon to life instead of death. Carbon Sequestration Cascade; Each Black Carbon gram (biochar & humus) can increase Water Retention by 8 grams, and can support 10 grams of Green Carbon, which each can feed up to 10 more grams of fungal mycelium White Carbon growth

Carbon has been fundamental to life since the birth of our planet. It's the source of all wealth and the conduit of all joy. Carbon cycles among and between billions of interconnected earthlings, whose fates teeter on the element's return trip to the soil. Only the generous reciprocity inherent to life macrocycles can restore abundance and harmony to the planet of the living. May we celebrate a happy Intended Anthropocene, anointed in water & Soil rather than Oil and Blood.

For a complete review of the current science & industry applications of Biochar please see my USBI 2016 Presentation; <http://usbi2016.org/schedule/>

(Slides & down load:) <http://biochar-us.org/presentation/civilization-soil-hall-marks-unintended-intended-anthropocene>

How thermal conversion technologies can integrate and optimize the recycling of valuable nutrients while providing energy and building soil carbon, I believe it brings together both sides of climate beliefs. A reconciling of both Gods' and mans' controlling hands. "The Civilization of Soil", Hall Marks of The Unintended & Intended Anthropocene (The full text & citations are on my LinkedIn page; <https://www.linkedin.com/pulse/civilization-soils-hall-marks->

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unintended-intended-erich-j-knight?trk=prof-post I have come to see a new definition of the Anthropocene, divided into two parts, The Unintended and the Intended. The measure which will codify this new age, a manifestation of the Intended Anthropocene, will be increased soil carbon content & with that the restoration of ecosystems and climate stability world wide.

The primary measurement and establishment of the Unintended is the Ag revolution 12K years ago. Measured by many proxies of Land use changes, (LUC), The Intended Anthropocene has a single very hard measurement of radionuclides, so we have a hard date of inception; 1964, the test ban treaty. (rocks & sediments don't lie). Around this time Rachael Carson also clued us in to chemical LUC in "Silent Spring". Since that time the offending measures have declined.

So the Holocene, the age of man, can be measurably divided into Intended & Unintended eras. Now we are at a new Intended age which I call; The Diamond Age.

If I May be so bold,... As I speak for Biologic Carbon... I speak for the very center of life itself. We have been burning it for over one million years, exploiting it out of the soil for 12,000 years and combusting fossil carbon for over 150 years. Now, we can grow nano-structured fossil carbons into an unprecedented variety of materials and even human tissues.

The Stone Age did not end for a lack of stones, as well, the Combustion Age will not end for lack of fossil fuels. Nanotechnology and Terra Preta Soil Technology has thrust The Diamond Age upon us, with it, the rectification of the Carbon and Nitrogen Cycles, Restoring Soil Ecology, In turn rectifying the Hydrologic and Climate Cycles, this train is leaving the station, either get on board or be left in the combusted soot and CO2 pollution of history! Since we have filled the air, filling the seas to full, Soil is the only ubiquitous and economic place to put it.

Thank you for your efforts

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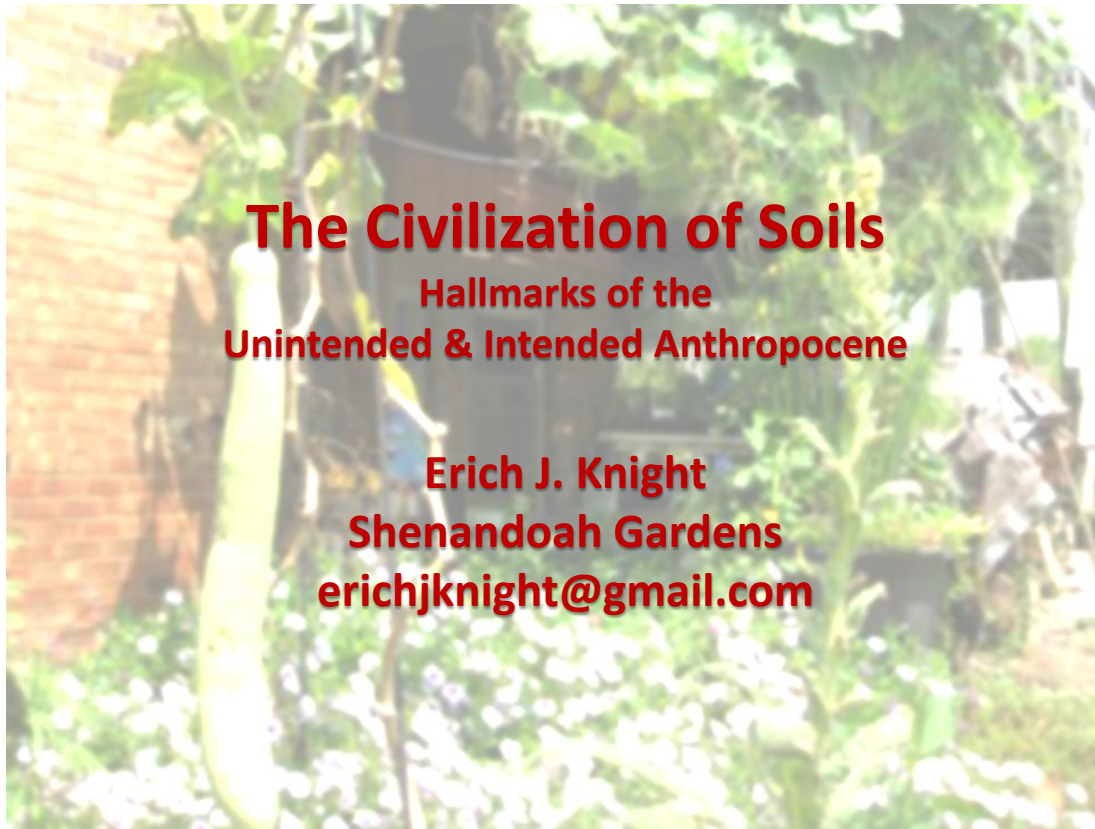
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**Fig. 1.** "The Civilization of Soil"

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