Adapting to our future: Extreme Weather Events, a Worldwide Energy Revolution and Geoengineering options

Facilitators: *Paul Belanger* and *Phil Nelson* - OLLI west campus – 8 weeks

This class starts by examining how Man's burning of fossil fuel sources generates Greenhouse Gases (GHGs) and how that creates a feedback mechanism of increased water vapor and transfer of associated energy into the oceans and atmosphere. This in turn leads to discussion of extreme weather events (heat waves, floods, wildfires) examined in weeks 2 and 3.

Weeks 4 thru 7 will deal with how Climate change has spurred on an energy revolution. We will examine current means of electrical generation and grid distribution. We will also examine: concepts of baseload energy and energy balance; the surge in wind and solar energy; ideas regarding the future delivery of electricity; and storage of excess production for use at times of deficit.

Week 8 will discuss two geoengineering options: Solar Radiation Management and Carbon Dioxide Removal. Emphasis will be on the production and application of BIOCHAR, which can generate biofuels while returning carbon dioxide to the soil, thereby promising to be a carbon negative technology.

Bios:

Paul Belanger, Ph.D., *a retired geologist who has first-hand research background in paleoclimate and paleoceanography using microfossils and stable isotope geochemistry. He has also worked in oil and gas exploration: Amoco, Arco and others.*

He is a graduate in geology, with a minor in oceanography from the University of Washington (BS) and Brown University (MS, Ph.D.); he was a National Research Council postdoctoral fellow with the USGS at Wood Hole, MA. His leading the Denver climate study group (see http://www.denverclimatestudygroup.com/) in talks and discussions on climate change, energy issues, and related socio-economic sustainability issues that have given him a big-picture view of the present and future climate issues expected to occur.

Phil Nelson, Ph.D.,

Phil Nelson is chair of the Golden Chapter of Citizens' Climate Lobby, a non-profit group that seeks national legislation to reduce climate change. He has degrees in geophysics from MIT and has worked for Kennecott Copper, Standard Oil of Ohio, and the US Geological Survey, where his work focused on improving the technologies for finding and extracting minerals and oil and gas, and for disposal of radioactive waste. Since retiring, he devotes much of his time to Citizens' Climate Lobby.