**Course Syllabus**

**Earth’s Climate: Past, Present and Future**

**Fall Term - OLLI West**

**September 16– November 4, 2014**

**Tuesday 9:30-11:30 am**

**Facilitator: Paul Belanger;** [**pebelanger@glassdesignresources.com**](mailto:pebelanger@glassdesignresources.com)**; cell 303-249-7966**

If you are unable to attend the first session, please notify the facilitator by email.

**Readings**:

All readings will be handouts distributed weekly by e-mail or hard copies handed out in class for those without Internet access; please advise me of the latter. The readings will include excerpts from books, articles, and web site links. There are no required books for this course, although I might suggest some for those wishing to delve more into the topics at hand.

**Weekly Topics:**

Updates to the syllabus below will be updated and expanded with resources, links and suggested reading before, during and after various classes at: [http://www.denverclimatestudygroup.com/OLLI/index.htm.](http://www.denverclimatestudygroup.com/OLLI/index.htm) At a later date, resources, links etc. will also be entered at the OLLI portfolio website.

Class Type: Illustrated Lectures, some video and discussion; in lieu of 3rd class there will be a field trip to National Ice Core Lab located at USGS in Lakewood; <http://icecores.org/> at 9 a.m. Tuesday September 30th. I will have room for a total of 35 persons for the Ice Core Lab field trip and will solicit for other-than-class members on a first come, first served basis. See if your spouse or significant other wishes to come.

1. Tuesday September 16th, 9:30-11:30 a.m.: Introduction

* Key principles of climate change
* The difference between weather and climate
* Climate system: feedbacks, cycles and self-regulation (climate, not government)
* What determines Earth’s climate

1. Tuesday September 23rd, 9:30-11:30 a.m.:

* Earth's deep past before the Cambrian (600 MaBP): hot and cold
* Earth’s past: Cambrian onward: mostly hot-house Earth; 100s parts per million (ppm)
* Climate trend in the Cenozoic – the last 65 million years; proxy data from 3600ppm to <200 ppm.
* More recent past: 180-280 part per million; how do we know – empirical data. Preview of next week’s field trip
* Today: 400 ppm and growing 2-3ppm/year

1. Tuesday September 30th, 9:00-11:30-noon: (important: bring government issued ID), hat, coat, gloves for – 40 degrees F. and adequate time to be checked in at the gate – details to follow in class.

* Antarctic ice cores
* Arctic Ice cores
* What the data tells us
* it will include some lecturing by Ice Core Lab personnel

1. Tuesday October 7th, 9:30-11:30 a.m.:

* Follow up to ice core lab field trip
* Signs of climate change/how has it changed: ocean acidification, Arctic warming
* Global carbon emissions of Carbon dioxide (CO2) and Methane (CH4)

1. Tuesday October 14th, 9:30-11:30 a.m.:

* Future projections and feedbacks:
* Models
* Rates of change: analogs and various comparisons to the past
* IPCC Fifth Assessment report (AR5): <http://www.ipcc.ch/report/ar5/>

1. Tuesday October 21st, 9:30-11:30 a.m.:

* Solutions?
* Geoengineering: Solar Radiation Management (SRM) and Carbon Dioxide Removal (CDR)
* The economics of doing nothing vs. the economics of mitigation
* There is promise, but at what cost? (One might be surprised).
* Biochar vs. BECCS solutions

1. Tuesday, October 28th, 9:30-11:30 a.m.:

* It’s not about climate change as much as sustainability
* Energy
* Urban heat islands
* Food security
* Population growth; potential refugee issue of climate change

1. Tuesday November 4th, 9:30-11:30 a.m.: conclusion

* Welcome to the Anthropocene
* Looking ahead
* Your carbon footprint
* Is the future of our climate still in our hands?
* Wrap-up