The UNIVERSITY of OKLAHOMA
Environmental Concerns Committee

Minutes

ENVIRONMENTAL CONCERNS COMMITTEE MEETING

Call To Order

A Zoom virtual meeting of the Environmental Concerns Committee was held on January 24th, 2023. It began at 11:03 AM and was presided by Heather McCarthy, the Environmental Concerns Committee chair.

Attendees

Voting Members in Attendance: Heather McCarthy, Cian Brown, Jared Mathis, Melodi Franklin
Ex-Officio Members in Attendance: Zheng Shi, Sarah Ballew, Dorothy Flowers, Randy Peppler, Ame Aziere, Chris Snider, Zhina Rashidzadeh, Robert Knox

Agenda Items

I. General Business

a. Presidential Dream Course: Engineering the Nature of Change – Distinguished Speakers Series
   i. 5 speakers are scheduled for the semester. Events will take place at the David L. Boren Auditorium of the National Weather Center at 6:30 PM.
   ii. Schedule:
   February 7 – Todd Bridges
   February 28 – Heather Tallis
   March 21 – Bob Hedin
   March 30 – Stephanie Lansing
   April 25 – Bill Mitsch
   iii. Flyers for each speaker event are attached to this email.

b. Environmental Stewardship Award
   i. Three categories: individual, department and student group
   ii. Distribution plan:
      1) ECC Email List
      2) Staff Senate
      3) Faculty Senate
      4) Provost Bulletin
      5) Student Environmental Coalition
   iii. Timeline:
      1) Distribute Call for Nominations document in early February.
      2) Nominations open until the day before the March ECC meeting (March 13th).
      3) Voting members then have approximately a week to review submissions and submit votes.
      4) Winners are invited to the ECC April meeting for acknowledgement.

c. Future Meetings
    i. Look for potential change in time to accommodate elected officials needs this semester.
    ii. Meetings tentatively scheduled for February 14th, March 14th, April 11th and May 9th.

I. Program Presentation

Ecosystem Response to Climate Change – Zheng Shi from the Institute for Environmental Genomics (IEG)

- Site: Kessler Farms
- Over the previous 150 years, the global surface temperature has increased by more than 1 degree Celsius, with a stark increase in the most recent 60 years.
- Increase in surface temperature data corresponds to anthropogenic release of greenhouse gas emissions.
- Atmospheric carbon dioxide (CO2) concentrations have risen 100 ppm as observed at the Mauna Loa Observatory.
- Additionally, both measured concentrations of nitrous oxide (NO2) and methane (CH4) have increased.
- The greenhouse gas effect has both increased global temperatures and impacted hydrological processes. The IEG is interested in how ecosystems respond to these changes.
- Ecosystem carbon cycling – observing photosynthesis, respiration and decomposition processes.
- A huge amount of carbon exists in soil and respires as part of the ecosystem carbon cycle.
- Kessler Farms: OK Warming Site: long-term experimental climate change.
    i. Grassland Field Experiment: experiment manipulates temperature, precipitation, and landscape clippings
        1) Established in 2009
        2) Infrared radiator is used to heat the air and soil to mimic climate warming.
        3) A plastic barrier was utilized to decrease rainfall in certain areas.
        4) In other areas, an increase in rainfall was simulated.
        5) In some areas, plants were cropped to mimic hay harvest
    ii. Data
        1) Warming – air modified by increase of 1 degree Celsius compared to control air; soil temperature modified to increase by 3 degrees compared to control soil.
    iii. Measured Variables
        1) Plant and Soil
            a. Plant productivity
            b. Photosynthesis
            c. Respiration
            d. Soil respiration
            e. Soil carbon
        2) Microbe
            a. Richness and diversity
            b. Functional genes

iii. Findings: As the experiment ages, more and more novel insights have been gained.
    1) Warning reduced richness of microbial communities and phytogenic diversity, with warming being the largest impact of the three measured variables.
    2) Divergent succession under warming. Experimental warming was shown to lead to increasingly divergent succession of the soil microbial communities, with possibly higher impacts on fungi than bacteria.
    3) Warming significantly increased network complexity, including network size, connectivity, average clustering coefficient, relative modularity, and number of keystone species.
    4) Warming stimulated many functional genes for carbon degradation as well as nitrogen cycling.

iv. Microbial-Enzyme Decomposition (MEND) Model
    1) Utilized model to predict, under control condition, microbial respiration increased. Under warming, microbial respiration also increased but with microbial degradation.

v. Conclusions
    1) Warming reduced richness of microbial community, alters its composition, enhanced the complexity and stability;
    2) Warming enriched many functional gene abundance related to carbon and nutrient cycling;
    3) Gene-informed model revealed microbial adaptation of microbial respiration.

Adjournment

Meeting adjourned 11:48 AM