

# Learning diary for function on plants in a changing environment(2021)

Liang Chen

29 3 2021

## 1 Motivation

I am a PhD student from Joensuu campus and my research direction is more focus on how forest productivities (e.g NEP,<sup>1</sup> NPP<sup>2</sup> and GPP)<sup>3</sup> and forest stability response to changing climate in the Northern Hemisphere. I have collected massive data, including **carbon flux data**, **remote-sensing data** and **N deposition data**. All those data are, however, at ecosystem level, I was not aware of the importance of the micro and physiological knowledge until recently I was trying to find out the hidden principles underlying macro phenomena. For example, tree canopy conductance is a up-scaling term which from reversed Penman-Monteith function, however, It could be perceived as a cumulative effect of all single stomatal conductance at leaf scale. Thus, enhancement of my poor plant physiology knowledge is essential for me. This course - *function on plants in a changing environment* provided us (at least for me) with such a good opportunity to fill the gap of lack of relative knowledge(Randerson et al., 2002).

This course focused on some important environmental variables (e.g air temperature, N deposition, water stress), and provided integrative explanations as well as different view of points. Personally, I was very interested in contents about photosynthesis metabolism and water stress. Due to the two parts were really close to further study. For example, I was plan to quantify drought with drought index, and then analyzing the relationship between forest productivities and drought events.

In addition, thanks to this course, I have further improved the skills for the creation of a scientific poster. I used to produce a poster by PPT, however, one issues always bothered me is that PPT can not support vector image, thus, visibility of a poster is limited. During the course, I learned how to use the **Adobe InDesign** for the creation of a poster. What's more, it was also a good opportunity for students to practice the presentation skill and team-work skill. For example, a simple but important thing - organizing online meetings.

## 2 Feedback

### 2.1 overlapping issues

At this moment, for me, this course provided very unique contents about how plants against changing environment. Reasons might be that, rest of courses i applied are more about modeling and programming.

---

<sup>1</sup>Net ecosystem productivity, defined as the difference between gross primary production and total ecosystem respiration, represents the total amount of organic carbon in an ecosystem available for storage, export as organic carbon, or nonbiological oxidation to carbon dioxide through fire or ultraviolet oxidation (Woodwell and Whittaker, 1968)

<sup>2</sup>Net primary productivity, defined as the difference between GPP and autotrophic respiration (Woodwell and Whittaker, 1968)

<sup>3</sup>Gross primary productivity, defined as carbon uptake by plants during photosynthesis (Randerson et al., 2002)

## **2.2 Which parts and tasks in the course worked and helped you in your learning? Why?**

Photosynthesis metabolism, water stress and poster design, there were all help me a lot. There either close related with my study or helped me to improve new skill (e.g poster design).

## **2.3 Were there parts and tasks that you found difficult or not well planned?**

For me, every thing were well planed. Although some contents for me were really new, such as BVOCs. New things always encourage people to keep learning.

## **2.4 Which things you would change for the following course and which parts would you keep?**

I think all things are fine, the only challenge for both teachers and students is the way of course going - online. Teachers may suffer unusual quiet, for students, they can not concentrate. So I would like to say, online teaching more or less may reduce the student enthusiasm and involvement. (At current situation, online teaching is of course understandable)

## **3 Acknowledgement**

First, I would like to appreciate all teachers from this course. Then I would like to thank all members from group VII (Xudan Zhu; Alena Kurilina; Suvi Jalokoski). Last but not the least, Our poster used FLUXNET data acquired and shared by the [global FLUXNET community](#) (Pastorello et al., 2020).

## **References**

- Pastorello, G., Trotta, C., Canfora, E., 2020. The FLUXNET2015 dataset and the ONEFlux processing pipeline for eddy covariance. *Scientific data*, 7 (1).
- Randerson, J., Chapin Iii, F., Harden, J., Neff, J., Harmon, M., 2002. Net ecosystem production: A comprehensive measure of net carbon accumulation by ecosystems. *Ecological applications* 12, 937–947.
- Woodwell, G.M., Whittaker, R.H., 1968. Primary production in terrestrial ecosystems. *American Zoologist* 8, 19–30.