

## **Subject: Call to participate in Bayreuth Phytometer Initiative**

Dear ClimMani members,

We would like to formally invite all ClimMani members to participate in our 2017 phytometer initiative that many of you were introduced to at the Novi Sad meeting last October. We have partially revised our protocol thanks to helpful feedback in Finse, Norway last month, and we gained seven additional partners for the project in seven different countries. The strength of the initiative depends on participation from as many sites as possible, and we are hoping that many of you are willing to join us. Below we highlight the research aims of the initiative, the requirements for participation, and what you will gain from participating.

**Project Goals:** Our phytometer experiment creates a living reference unit for community ecology that indicates the relative influence of cross-site climate and soil conditions of emergent community properties. By using a standardized plant community and substrate alongside the same plant community planted in local soil, sites spanning environmental gradients gain a valuable common metric for disentangling vegetation drivers. This common metric is a biological indicator that naturally incorporates the many physical variables that influence vegetation. We do not view the phytometer approach as a replacement for measuring environmental variables or for conducting studies on the natural vegetation of a site, but rather as an add-on that connects sites via a common biological metric.

The second goal is to develop a dataset of phytometer properties across a broad geographic extent and gain fundamental insights on the relative influences of climatic drivers on community properties. This builds on previous efforts to do so by having a system that is independent of local soils and the evolutionary history of vegetation with a site. The strength of this goal rests on high replication of the phytometers across a variety of sites. This is where we are hoping the ClimMani community can help through participation. We envision a minimum of two sampling dates per site of phytometer growth: one after a 50-day growth period matched to the peak growing season of each site, and a second harvest one year after the first.

**Participation:** For this phase of the phytometer project, we are interested in collecting environmental variables beyond what might be required in the future. This is to gain a deeper understanding of the ecological characteristics of the phytometers. Nonetheless, the effort and cost to you remains low. Minimum requirements for participation are installing a single phytometer set (10 pots total) at your research site, though we encourage you to install additional sets in any ongoing experiments or gradient studies you may be conducting if possible.

Currently, we estimate the phytometer to cost approximately €50 for the first phytometer set, and €350 for each additional set you install. This cost covers PRS probes to assess nutrient content and TidbiT dataloggers to measure soil temperature. We will send detailed ordering information to make this as easy as possible for you. This cost is reduced to €150 if you are able

to allocate your own soil temperature data loggers to the phytometers for the duration of our one-year trial. We will ship everything else you need to produce the phytometers.

Time commitment to the phytometer is low. We anticipate four periods during this summer that require 1 to 5 hours of work: transferring germinants to quickpots, transferring seedlings to the phytometer pots and digging them into the site, harvesting the phytometers at the end of the 50-day growth period, and processing root in-growth cores. There are also minimal watering requirements for growing the phytometer species prior to the 50-day trial period. After the initial 50-day growth period, the only requirement is one weeding period in the following spring, and an additional harvest one year after the first harvest. We have attached the updated protocol should you want to gauge effort for yourself.

What you gain: First, we hope that you find value in the phytometer project by gaining understanding of the characteristics of your research site(s) relative to others in the ClimMani network. Second, we envision two papers emerging from this initiative. The first is a conceptual paper on the expanded use of phytometers in ecology. This would introduce our method to the broader ecological community, and advocate for its use by demonstrating its value. This paper is opt-in for those who are interested in developing the concept and method further. The second paper is the data-driven paper where we aim to examine the primary drivers of phytometer growth. For this paper, we offer automatic authorship to two members of each site that participates with a phytometer set.

With the growing season fast approaching, we would like to send out packages to as many collaborators as possible so they can begin the process of growing the plants for the phytometers. For this summer, we calculate a 116 period from beginning to germinate seeds to harvesting phytometer pots, which should coincide with peak growing season of your site where possible. If you are interested in participating, please fill in the attached sign-up sheet and send it to Peter Wilfahrt ([peter.wilfahrt@uni-bayreuth.de](mailto:peter.wilfahrt@uni-bayreuth.de)). Please also feel free to contact Peter if you have questions about the protocol or to ask for further details before deciding whether to participate. We are excited to have you join!

Best wishes,

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