

ExpeER

Distributed Infrastructure for EXPERimentation in Ecosystem Research

Grant Agreement Number: 262060

SEVENTH FRAMEWORK PROGRAMME

Capacities

Integrating activities: Networks of Research Infrastructures (RIs)

Theme: Environment and Earth Sciences

MS8: Initial (internal) training programme conducted

Due date of deliverable: M22 (September 2012)

Actual submission date: M21 (August 27-31, 2012)

Start date of the project: December 1st, 2010

Project duration: 48 months

Organisation name of lead contractor: CNR

Contributors: Giorgio Matteucci

Revision N°: V01



1st EXPEER Training week

“TEsting and REfining SAMpling Protocols for Ecosystem Research”

TERESA-PER

August 27-31, 2012

27, 28 and 31/08/2012: CNR Research Area Roma-1, Montelibretti, RM (Central Italy)

29-30/08/2012: Ecosystem Research sites in Abruzzo Region (Central Italy)

The event, main achievement and next steps

The 1st ExpeER training week was organised to test the protocols for ecosystem data collection being developed by WP2 of ExpeER.

Background

ExpeER involves establishing methods to detect changes in ecosystems, using methods that allow data to be integrated from across the ExpeER sites across Europe, to detect ecosystem change at the continental level. To represent the ecosystem, parameters are needed that describe the ecosystem structures, (biodiversity and heterogeneity) and processes (energy, water and matter balances) according to the **ecosystem integrity framework** (Barkmann *et al.* 2001). The list of parameters recommended to be measured across Europe is based on this idea and using criteria including: how common the parameter is, whether it is regarded as important for the monitored ecosystem, if it is indicative of the site and reflects its peculiarity.

The task of WP2 is to develop standardised protocols to measure a set of key parameters that could serve as a pilot for establishing a set of consistent protocols across Europe. If these protocols are then carried out for a few years and a continental pattern emerges, it will encourage site managers to adopt more parameters with standardized protocols and more initiatives like this would be launched.

The parameters were chosen according to the following criteria:

- Important to ecosystem integrity
- Common to many ecosystem research sites
- Protocols are of an intermediate complication level, can be easily executed and not too expensive
- The parameters cover a variety of processes within terrestrial ecosystems.

The search for the parameters started with the launch of ExpeER in January 2011, taking into account information from WP1 on which parameters were already being measured at ExpeER sites. ExpeER members were consulted to develop first a long list of parameters that was subsequently prioritised. This list was brought to the WP2 meeting at Leipzig (February 2012), which considered the list against the above reported criteria and chose a list of 10 parameters. Each parameter was given to the responsibility of a committee member. Between March – June 2012 the person in charge of each parameter developed the first draft protocol, using additional expertise as required.

Selected parameters

The set of parameters is as follows, including which ones were trained at this first training course, held in Italy in August 2012:

Parameter	Responsibility for protocol	Trainers	Trained in August 2012
leaf area index	Giorgio Matteucci and Miklos Kertesz	Giorgio Matteucci and Miklos Kertesz	YES (mostly forest)
plant biomass	Giorgio Matteucci (forest) and Miklos Kertesz (meadows - grasslands)	Giorgio Matteucci and Miklos Kertesz	YES (mostly forest)
soil macrofauna	Elli Groner + Mark Frenzel	Cristina Menta (soil macrofauna)	YES
soil moisture	Carsten Mueller	Carsten Mueller	No
soil nutrients (NPS concentration)	Carsten Mueller	Carsten Mueller	No
soil organic matter	Carsten Mueller	Carsten Mueller	YES
soil respiration	Gemini Delle Vedove, Laura Zavattaro (Giorgio Matteucci)	Gemini Delle Vedove Chiara Bertora Simone Pelissetti (Giorgio Matteucci)	YES
evapotranspiration	UNIUD (Gemini Delle Vedove)	Gemini Delle Vedove Giorgio Matteucci	YES, but without "hands on data"
land use type	Les Firbank	Les Firbank	YES
phenology	Miklos Kertesz	Miklos Kertesz	NO

A total of 25 people, including the trainers, participated to the training week. Participating people were coming from CNR (2), Univ. of Torino (5), Ben Gurion University and Arava (2), Univ. of Udine (1), Univ. of Parma (1), Univ. of Leeds (2), Hungarian Academy of Sciences (1), Technical University of Munich (1), IMK-IFU of Garmish (2), Univ. of Novi-Sad (2), Univ. of Helsinki (1), Univ. of Rome *La Sapienza* (1), Univ of Tuscia – CNR (4). Approximately one third were PhD students. The participants covered the travel costs from/to their place of origin to Rome but all the local logistic costs were covered by CNR on ExpeER budget.

The training was organised with three days at the CNR research area Rome 1, mostly with class-room presentations on protocol but also some practical sessions (soil macrofauna, soil respiration). part, and two days in the field, visiting two experimental sites in beech forests (LTER – EnvEurope site Collelongo - Selva Piana and ManFor C.BD. experimental forest at Chiarano – Sparvera) and practicing Leaf Area Index, Soil organic matter, land use and tree biomass protocols.

All the participants were requested to provide feedbacks to evaluate the training week as a whole and on the single protocols, in order to improve them.

Main achievements and next steps

The training week was judged successful and useful by all the participants.

The protocols of the 7 (out of 10) parameters trained are at different stages of development; all of them need more work, but some only require fine tuning. The training helped a lot in focusing the needs for refinement. Leaf Area Index (LAI) is going to be considered as 2 separate parameters for now – direct and indirect methods. The remaining three parameters, **phenology**, **soil moisture** and **soil nutrients**, will be developed in the coming weeks. All protocols need revisions to justify why the method was chosen, and will include a basic literature review of what is currently been tried across the world. It also needs to include a list of what has to be standardized and what does not.

Due to the expertise and research activities at experimental and LTER sites of the local organiser, the practical part performed in the field was focused on forest ecosystems. Although some of the protocols are not fundamentally different between ecosystems, the next training should balance the practical sessions more equally among (e.g.) grasslands, croplands and forest./

The core group of WP2 plus the trainers formed an efficient working group that should ensure effective fine tuning of the protocols and the successful realisation of the next steps. This work will involve testing some of the parameters trained over the next 9 months. Four parameters were chosen: **soil organic matter (SOM)**, **soil macrofauna**, **plant biomass (BM)** and **land use type (LU)**. There are all ready 7 volunteers to try these parameters, but we hope that once we send out the protocols, others will join the exercise. All the parameters will be recorded at the beginning of April or in other suited periods before May and then reported to Tali Shimony – BGU by the beginning of May.

The remaining 3 parameters: **soil respiration**, **LAI** and **evapotranspiration** are developed but are more complicated and may need more work on fine tuning. Also they may be limited to sites with the appropriate equipment, or are not suitable/meaningful to be collected between October and May.

Time table:

2012:

- October 15 – finalizing protocols for existing 7 parameters.
- November 15 – Tali to send final protocols, first to WP2-training working group and then to the ExpeER coordination. Invitation to all LTER and EXPEER sites to try the protocols in the spring.

2013

- April – finishing field collection of chosen 3 parameters (SOM, soil macrofauna, BM, LU) in the 7 volunteers and hopefully more sites.
- May 2 – sending Tali the data of the recorded parameters + land use type.
- Week 20 or 21 (13-17 or 20-24) – 2nd training session, CNR, Italy
- July – 3rd training session
- August – report submitted