COST ACTION FP1202 MaP-FGR

PROGRESS REPORT OF WORKING GROUP 1

GENERAL AIMS OF WG 1

- Gathering of already available data and compilation of ecological, genetic and global change information, and particularly climate effects, on FGR and distribution of MaP populations (e.g. climatic scenarios and models, forest decline maps, lists of endangered materials). WG1 will be mainly focused on **Task 1** (scientific and technical information on ecological conditions: climatic maps, climate change scenarios, soil types and morphology, identification of pedo-climatic parameters characterizing species ranges) *and* **Task 2** *(Genetic information including adaptive traits of MaP populations at the limits of species distributions)*. Deliverables:

    - Maps, atlas, databases (D1)
    - *A web-based directory of human resources and infrastructure /organizations working or skilled on FGR of MaP populations (D2)*
    - *A directory of genetic resource conservation methods applied in COST and neighboring countries, with special reference to global change (D3)*
    - *Database of forest genetic resources for conservation and for use (genetic conservation units, basic material, genetic trials)(D4)*

SPECIFIC AIMS OF WG 1 FOR 2013

- Survey on the existing information on ecological conditions: climatic maps, climate change scenarios, soil types and morphology.

- Elaboration of a first version of a high spatial resolution (1 km) Climate Database at European scale, that it is considered necessary (along with its future projections as climate change scenarios) for analyzing the ecological range (and dynamics) of marginal populations.

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In bold type; participants at First Plenary Meeting of the COST Action FP1202 in Rome (January 22-25th,2013). In normal type: members' information extracted from the National Reports available by September 6th,2013.

ORGANIZATION OF ACTIVITY AND PROBLEMS MET

- As a first step, during Rome meeting, it was agreed to draw up a template to request the ecological information (climate, climate scenarios, soil, vegetation surveys, vegetation maps), to complete the technical information requested in national reports. In the weeks following the meeting it was finished the first template that would be completed with the information contained in National Reports and subsequently clarified or supplemented by a survey. It included the following variables (figure1):

Figure 1. Survey template for ecological information

![MaP-FGR logo]

- After reviewing the information in the available National Reports until September 6th , It was prepared a summary of the requested information about Task 1 (figure2) highlighting the gaps to be filled through the survey:

Country	Expert/Contact	Climatic data
Greece	Ioannis Gitas (igitas@for.auth.gr) - A.U.Th. - School of Forestry and Nat.l Environment **Papageorgiou Aristotelis** (apapage@fmenr.duth.gr) D.U. School of Forestry and Mgt of N Environment	1.Digital weather data of Greece at weather stations [on-line, real time point **weather data** and climatic statistics for **temperature, precipitation, wind, cloud cover, humidity**), source: Hellenic National Meteorological Service/104 georeferenced stations]

Soil data

1. **European Soil Data Base** (ESDB) [polygon vector data of soil attributes, source: JRC_ESDAC, scale 1:1000000, also in raster and Google maps].
2. **Soil Threat Maps** (Erosion risk/PESERA, Topsoil Organic Carbon Content, Natural susceptibility of soils to compaction, Saline and sodic soils) [raster data, source: JRC_ESDAC, scale 1:1,000,000]
3. **Soil Map of Greece** (Edafologikos Xartis Ellados) [image, source: Institute of Geology and Miner...
4. Soil Map [Aristotle ...
scale: 1:2...

Topographic data

1. **Slope and aspect derivatives from ASTER* satellite Digital Elevation Model** (DEM) [grid raster, cell-size: 30 m, source: NASA/Jet Propulsion Laboratory, anced Spaceborne Thermal Emission and sterweb.jpl.nasa.gov/gdem.asp graphic map of Greece ('Nakos' map) [image, te in Athens/Soil Science Laboratory, scale 4. akos' map) [image, source: Forest Research Laboratory, scale 1:50,000, year: 1982] ://gdex.cr.usgs.gov/gdex/) n also be viewed and downloaded from the ps/ ge?_pageid=33,80043&_dad=portal&_schem onetwork/srv/en/main.home ma/

Land Cover & Land Use	Species distribution data
1. The **Corine Land Cover** provided by Environmental European Agency (EEA) 2. The **Forest/NonForest Maps** (for two dates-2000 and 2006-) and Forest Type Maps (for two dates-2000 and 2006-) provided by JRC 3. The **Forest Maps** provided by FAO upon request 4. The **Land Cover Maps** (for two dates-1987 and 2007-) provided by WWF Hellas 5. **Forest Service Products** produced in the framework of the research project Geoland 2 6) (http://www.gmes-geoland.info/service-portfolio/land-cover-and-land-use-monitoring-products.html) 6. **Land Cover and Land Use Monitoring Products:** European Land Monitoring (EUROLAND)(http://www.gmes-geoland.info/service-portfolio/land-cover-and-land-use-monitoring-products.html) 7. The **Land Parcel Information System**-LPIS provided by OKXE (Hellening Mapping and CadastralOrganisation)	
1.Details of UK Land cover map availability: http://www.ceh.ac.uk/LandCoverMap2007.html	1.**10x10km grid square distribution** maps of all UK species http://data.nbn.org.uk/

Figure 2. Ecological information summary (National reports)

- The main problems identified so far are the lack of National Reports, the lack of detailed information on the task 1 (national experts' contact included) in each country, the high heterogeneity of national databases available and the inadequacy of these databases to the objectives of the project (low spatial resolution, not updated, ...).

- In parallel to this collection of ecological information has been carried out the elaboration of a first version of a high spatial resolution (1 km) Climate Database at European scale, that it is considered necessary (along with its future projections as climate change scenarios) for analyzing the ecological range (and dynamics) of marginal populations. It was discussed in Rome about the problems of the various general existing climatic databases (WORLDCLIM, EOBS-7,etc.): several grid-based climate models are currently available to characterize bioclimatic parameters, from continental and global scale models to regional scale models, but in Europe the use of these models in accurate population analyses implies three common difficulties:

  i)   insufficient spatial resolution
  ii)   insufficient coverage
  iii)   methodological obstacles: scarce network of meteorological stations, blind algorithms for the interpolation of model residuals in order to force exact variables estimators.

  There is an initiative to develop a new 1-km gridded climate model at the European scale (for the climatic variables: mean, minimum and maximum monthly temperatures, and monthly precipitation) in the framework of the research project 'ADAPCON: Adaptive variations, environmental gradients and demography in Mediterranean conifers: from genes to phenotypes and niches' (Spanish National R+D+i Plan) with a deadline in September 2013.

- Other activities where members of WG1 were involved :
  - 2013 TRAINING SCHOOL: Genetic, ecological properties of marginal populations and their importance for conservation and use under climate change. 15 July - 19 July 2013, Chania, Greece:
    - Climate constraints in species distribution models. **Menzel, Annette**
    - Applications of Ecological Niche Modeling for forest trees species delimitation and MaP populations dynamics. **Gonzalo, Julian**
  - First & Second call for Short Term Scientific Mission. Selection process.

RESULTS

- It was developed a database on available ecological information at the national level to be completed with the delivery of missing national reports and the survey whose template has been designed (there are available information from only 15 countries)
- It was developed a first version of a new 1-km gridded climate model at the European scale (for the climatic variables: mean, minimum and maximum monthly temperatures, and monthly precipitation) with these broad features:

NETWORK

- ECA&D (European Climate Assessment & Dataset): 58 participants for 62 countries and the ECA dataset contains 26110 series of observations for 12 elements at 4824 meteorological stations throughout Europe and the Mediterranean (see Daily data > Data dictionary).

- GHCND (GSOD) (National Oceanic and Atmospheric Administration - National Climatic Data Center - Global Historical Climatology Network – Daily – Monthly – Global Summary Of the Day) GHCN-Daily contains over 75000 stations, approximately 20000 of which are regularly updated with observations from within the last month. While most of the sites report precipitation, daily maximum and minimum temperatures are also available from more than 25,000 sites.

- MET OFFICE - MIDAS (The British Atmospheric Data Centre, BADC, is the Natural Environment Research Council's, NERC, Designated Data Centre for the Atmospheric Sciences, Met Office - MIDAS Land Surface Stations data 1853-current)

- NATIONAL METEONETS: Spain: AEMET / Great Britain: MET OFFICE - MIDAS / France and Italy: ?? / Central Europe and Scandinavia: ?? / North Africa: ACMAD is the Weather and Climate Centre with African continental competence. It was created in 1987 by the Conference of Ministers of the United Nations Economic Commission for Africa (UNECA) and the World Meteorological Organisation (WMO). ACMAD has been operational in Niamey since 1992. ACMAD is composed of 53 Member States, the 53 countries of "Africa" continent.

DATA

- Meteo Data Spanning 1961-1990
- Spatial and Temporal consistency. Outliers analysis
- Representativeness: month and period
  - Record series selection criteria: at least 75% of monthly data (period) / at least 90% of daily data (each month individually)

  - Meteo station selection criteria: at least 20 years with 75% of recorded data
- Record series homogeneity: 95% SNHT (Standard normal homogenity test).
- Starting number of meteo stations   2750 p   836 tmax   753 tmin

METHODS

- Our methodological approach: co-regionalization of target climatic variables along with previously selected auxiliary variables, calculating the primary ones by Collocated-CoKriging (previous multiscale analysis: MultiFactorial Kriging – Climatic Faults).
- Prospective secondary variables: height and distance to the coast, distance to the faults, potential radiation, computed using the r.sun radiative transference model (©JRC Institute for Environment and Sustainability, 2003) and accounting for the orographic effect by means of hemispheric viewshed analysis, and cloudiness, which will be derived from multitemporal satellite imagery (e.g. AVHRR-NOAA cloud masks).

NEXT STEPS

- To share all the generated information (databases) through the website.
- To complete the survey on ecological information.
- To improve the version of a new 1-km gridded climate model at the European scale through the collaboration of all the WG1 experts: by densifying the meteo-station network, validating the model, improving the model.

- Working Group 1 will discuss the proposal of workshop for the next year :

  Title: **"Ecological conditions and climate change impacts affecting MaP populations: compilation and standardization methods for geodatabases"** (WG1)

  Location: To be fixed (proposal: Madrid/Santander/Barcelona – Spain, …)

  Date : To be fixed (April – May 2014) 1-2 days (to be decided) (or combined with MC meetings??)

  Number of participants to be reimbursed: 3 (max) external (non COST) invited speakers + steering board (9).

  Participants not reimbursed: 40

  Travel costs: 9600

  Organisational support: 2080

- Working Group 1 will discuss the possibility of organizing a workshop before November 2013 (remaining budget of 2013)