

## NATUREGATE ONLINE SERVICE AS A RESOURCE SOURCE FOR CMAPTOOLS

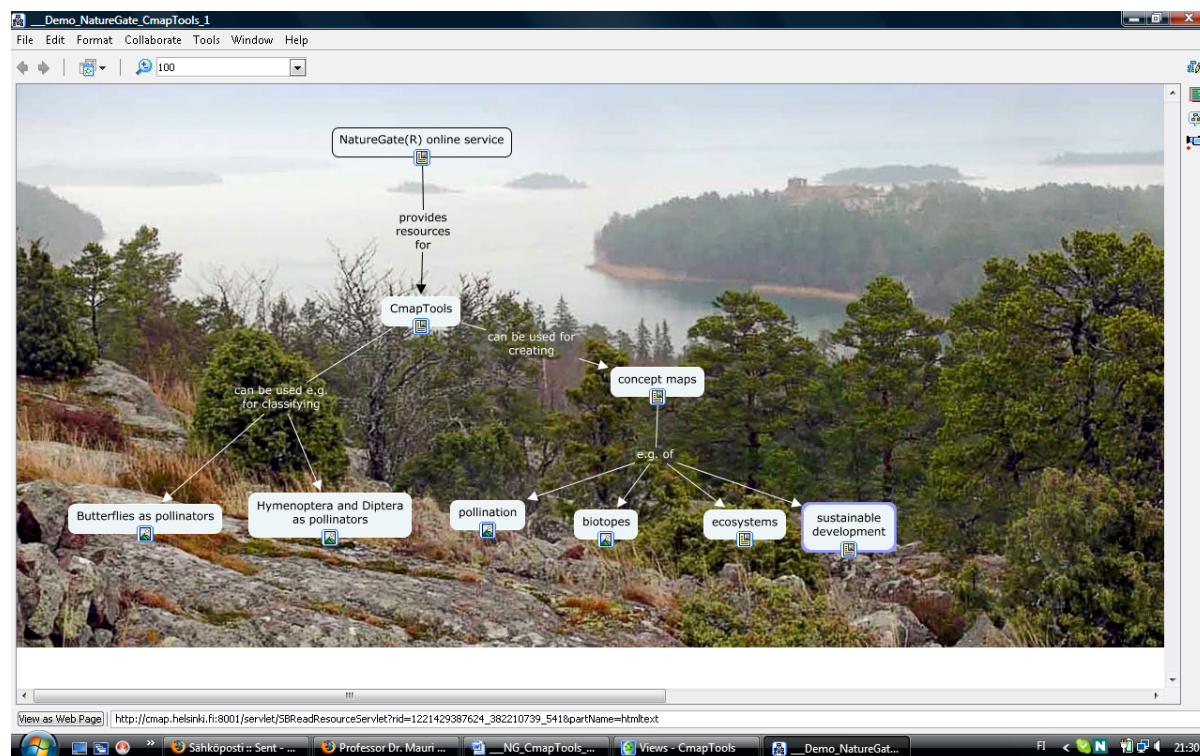
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**Abstract.** CmapTools software is good at integrating digital resources. NatureGate® online service contains increasing number of excellent digital nature photos which can be used as resource source for CmapTools. In this poster we demonstrate ways of using images from NatureGate® online service to create advanced concept maps by CmapTools. We suggest also global cooperation to integrate use of NatureGate® and CmapTools for promoting Biodiversity Education, Environmental Education and Education for Sustainable Development.

### 1 Introduction

The Research Group for Biology and Sustainability Education learnt first how to use CmapTools in 2005 (Åhlberg 2006b). Then at the end of February of 2006, Professor Mauri Åhlberg, producer Eija Lehmuskallio and photographer Jouko Lehmuskallio founded NatureGate® R&D and business program at University of Helsinki (Åhlberg 2006; Åhlberg, Lehmuskallio & Lehmuskallio 2006a - 2007). NatureGate® online service is a product of this group. It is based on 20 years of nature photographing by Eija and Jouko Lehmuskallio and over 20 years of research on education by professor Mauri Åhlberg. Doctoral student Arja Kaasinen joined the group in 2008. We presented integrating use of NatureGate® and CmapTools also in two posters in the international ENSI conference at Hanasaari, Espoo, Finland (Åhlberg, Lehmuskallio & Kaasinen 2008; Kaasinen & Åhlberg 2008)). University of Helsinki has sponsored the project from 2006 and became a partner of NatureGate® Ltd in 2008.

Biology and Sustainability Education involves use of images from nature. Best images create strong nature experiences. They invite you to go to nature, study it, take own digital photos and share them with other nature lovers. Images of professional nature photographer are often unsurpassable. Wise educator uses professional images when available, and perhaps own photos only for special purposes. Figures 1. and 2. are examples of using digital resources from NatureGate® online service to create impressive concept maps for biology and sustainability education.

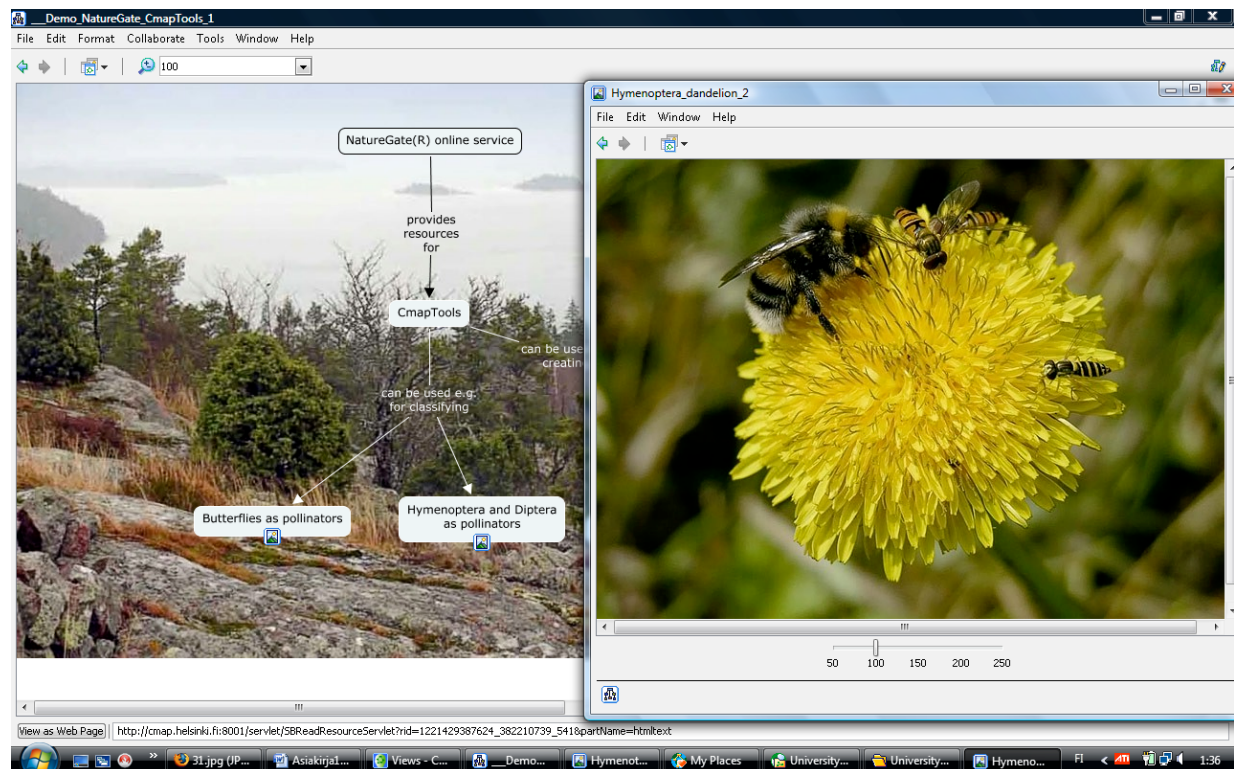


**Figure 1.** Images from NatureGate® online service as digital resources for using CmapTools in Biology and Sustainability Education. One image is used as a background. Six images are used as resource links for concepts. All photos are taken by Jouko Lehmuskallio. They are copyrighted, but allowed to be used for educational non-profit purposes on the net, as long as credit is given to the original source (NatureGate®) and to the photographer.

The idea of integrating knowledge by CmapTools and NatureGate® was first presented in Finnish and later on in English starting from 2006 (Åhlberg 2006 – 2008). The first pilot was created on the island of Hailuoto near Oulu. But because of lack of resources, after all it was not connected to Internet. The second NatureGate® online service pilot was finally opened on the island of Ahvenanmaa in the June of 2008.

CmapTools is a very versatile and powerful tool for building knowledge and integrating different data sources as demonstrated in the Figure. 1. An image can be used easily as a background for a concept map. Concept map can be added on the image. Color of links and texts can be easily changed to be easily readable. E.g. black links and black text were unreadable where the pines are on the image. That is why the color was changed to white, because it was the most prominent option.

The second photo is an example of a detail hidden into the landscape by use of CmapTools. At the bottom of the concept 'Hymenoptera and Diptera as pollinators' there is an icon which leads to the photo. The image is misleadingly named: 'Hymenoptera\_dandelion\_2'. Actually there one Hymenoptera species (a bumble bee) and two Diptera species (three flower flies).



**Figure 2.** An image, a digital resource of CmapTools has been opened. Because it is picked from NatureGate® online service it is of extraordinary quality. It is both beautiful, and contains plenty of information about pollinating insects, Hymenoptera and Diptera. All photos are taken by Jouko Lehmuskallio. They are copyrighted, but allowed to be used for educational non-profit purposes on the net, as long as credit is given to the original source (NatureGate®) and to the photographer.

## 2 Discussion

We are presenting the poster and demonstration the Third International Concept Mapping Conference (CMC2008), because we are looking for R&D and business partners all over the world. Eija and Jouko Lehmuskallio have the world wide patent for their unique, object and species identification software which is one of the core elements of NatureGate® online service. Selecting observable characteristic, interacting with the NatureGate® online service, you'll probably very quickly find the plant you are looking for from hundreds of wild flower images, e.g. using (1) color of flower 'red', (2) shape of corolla 'bell shaped', (3) shape of leaf is 'round' and (4) the height is under 10 cm. The result emerges:



**Figure 3.** Twin Flower (*Linnaea borealis*) was found out of 400 species of Finnish wild flowers using only four interactive easy steps.

In September 2008, NatureGate® online service is in four languages: English, German, Finnish and Swedish. During the academic year 2008 – 2009, French and Spanish versions will be added.

NatureGate® is patented like CmapTools. Both are however free to use for research and educational, non-commercial purposes. NatureGate® looks actively possible partners world wide for creating sister R&D and business groups in all regions and countries. Biosphere is locally diversified. Biodiversity is in danger. NatureGate® used wisely, by integrating way with CmapTools, will promote Biodiversity Education, Environmental Education and Education for Sustainable Development.



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