Prydatko V., Kolomytsev G., Burda R., Chumachenko S. **Landscape ecology: textbook on application of pressure based biodiversity modelling for national and regional educational purposes. Part 1 and Part 2.– Kyiv: NAU, 2008. — 100 pp.**

In a convenient format for self-study and self-testing for the first time for Ukrainian higher educational institutions the bilingual textbook (English-Ukrainian) provides the history of the issue, approaches and examples of thematic mapping-oriented modelling of the expected biodiversity taking into account the impacts on it within the context of GLOBIO Ukraine Region. It is based on rich groundwork of both national and foreign schools of modern landscape ecology, in their comparison. GLOBIO approaches are revealed for Ukrainian ecologists for the first time. The textbook also provides such approaches to biodiversity modelling as MSA, CLUE, EEBIO, LCCD_Bio, RS-GIS in terms of the region that are still little known to Ukrainian ecologists. After each unit there are questions for progress testing (in total 100). In annexes, there are 30 testing assignments and answer keys as well as examples of topics for independent, bachelor's and master's degree papers. The issue has a list of 169 sources of information, which will ease the use of testing assignments and will be a good resource for further self-study of future ecologists. The textbook is also a contribution to the development of bioticgeoinformation science as a new trend in ecology.

Figure 11. Assigning values of mean species abundance MSA_i in a dialogue window of ArcMap (a – for reclassification procedure, b – for the 'roads' factor, c- for the 'fragmentation' factor, d- for the 'atmospheric N deposit' factor.

Figure 23. A web-page from the CLUE. website [90].

Figure 22. A web-page from the BioModel website [91].

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LANDSCAPE ECOLOGY
Textbook on Application of Pressure Based Biodiversity Modelling for National and Regional Educational Purposes

Vasyl I. Prydatko,
Grygoriy O. Kolomytsev,
Raisa I. Burda and Sergiy M. Chumachenko

Kyiv–2008

landscape ecology   ландшафтна екологія

ЛАНДШАФТНА ЕКОЛОГІЯ
навчально-методичний посібник
з моделювання біорізноманіття

НАЦІОНАЛЬНИЙ АГРАРНИЙ УНІВЕРСИТЕТ,
КАФЕДРА ЕКОЛОГІЇ АГРОСФЕРИ ТА ЕКОЛОГІЧНОГО КОНТРОЛЮ
УКРАЇНСЬКИЙ ЦЕНТР МЕНЕДЖМЕНТУ ЗЕМЛІ ТА РЕСУРСІВ
АГЕНЦІЯ З ПИТАНЬ НАВКОЛИШНЬОГО ПРИРОДНОГО СЕРЕДОВИЩА
КОРОЛІВСТВА НІДЕРЛАНДІВ

В.І.Придатко,
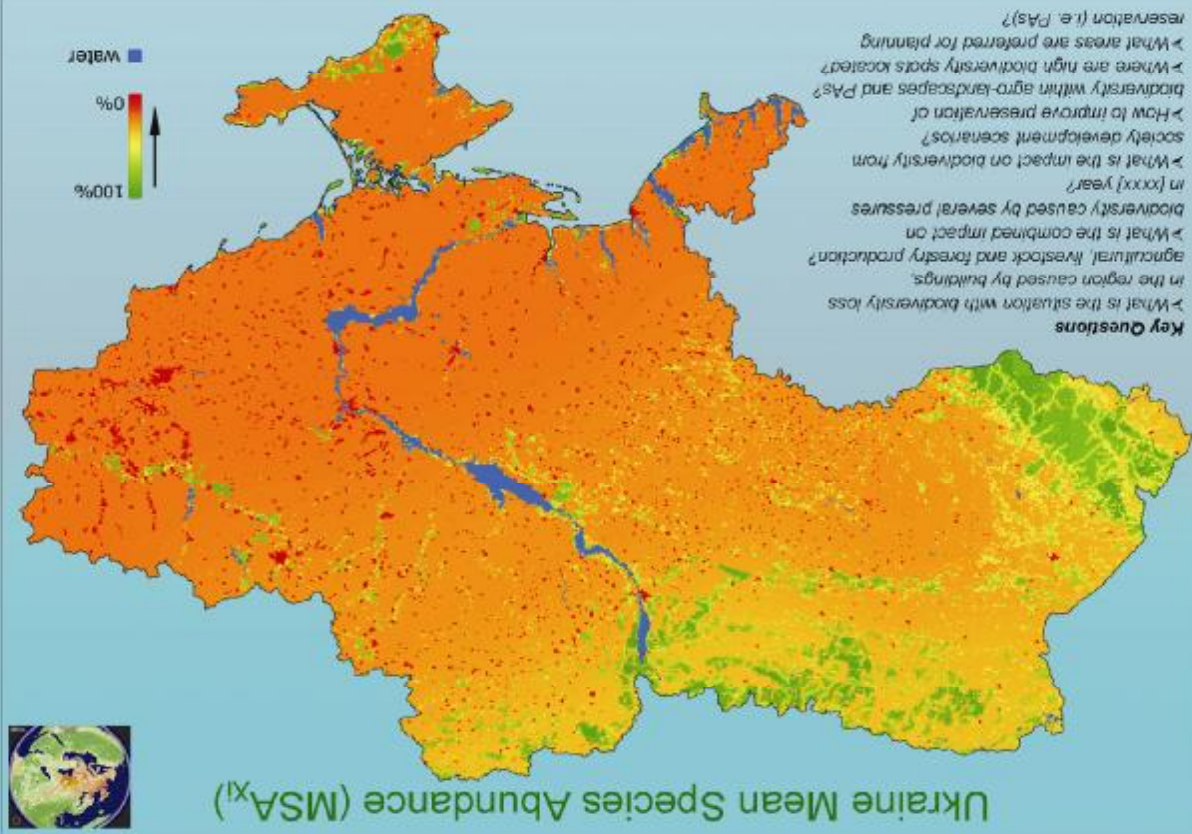Г.О. Коломицев, Р.І.Бурда,
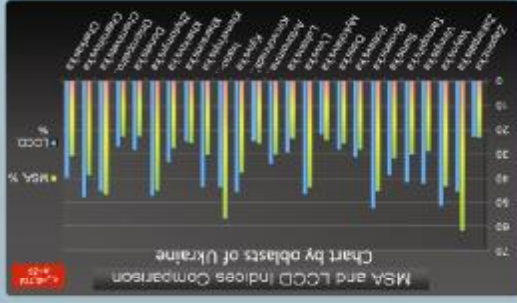С.М.Чумаченко

Київ–2008

Today you have choice with your modelling !

Biodiversity Modelling in GLOBIO-Ukraine Region: GLOBIO, EEBIO, MSA, RS-GIS, LCCD, NCI, LPI, GE etc. (2003-2008)

Today, you have a choice in modelling !

The MSA is an indicator of the remaining mean species abundance of original species, relative to their abundance in primary vegetation. It can be interpreted as a measure of "naturalness" or "intactness". MSA is calculated based on the following pressures: land use change, infrastructure impact, fragmentation, nitrogen deposition and climate change. In the GLOBIO3 model the MSA is calculated according to following formula: $MSA_i = MSA_{LU} \cdot MSA_N \cdot MSA_I \cdot MSA_F \cdot MSA_{CC}$, where i is the index of the grid-cell, MSA_{Xi} is the relative mean species abundance corresponding to the following drivers and indices: LU (land-cover/use), I (infrastructure), N (atmospheric N deposition), F (fragmentation) and CC (climate change).

Ukraine Mean Species Abundance (MSA_Xi)

- MSA Atmospheric N Deposition
- MSA Climate Change
- MSA Fragmentation impact
- MSA Infrastructure impact
- MSA Land Use Change

100%
0%
■ water

Key Questions

➤ What is the situation with biodiversity loss in the region caused by buildings, agricultural, livestock and forestry production?
➤ What is the combined impact on biodiversity caused by several pressures in [xxxx] year?
➤ What is the impact on biodiversity from society development scenarios?
➤ How to improve preservation of biodiversity within agro-landscapes and PAs?
➤ Where are high biodiversity spots located?
➤ What areas are preferred for planning reservation (i.e. PAs)?

Other Popular Regional Examples on Modelling:

biodiversity, population state and/or fauna and flora habitats (from the top to the bottom): 1) trends of population state by indicator-species groups in cross section of natural and agricultural zones in 1950-2005, by experts assessment [14]; 2) RS-GIS-index: amplitude of indicator-species habitat changes for a decade [9,10]; 3) occurrence of 'point' RDB-species habitats in the mega agroecosystem of Ukraine [15]; 4) LCCD and its comparison with phyto-biodiversity [16,17]; 5) biodiversity evaluation using multi-spectral satellite images of average spatial resolution [84,157]; 6) remnants based on Landsat [83]. See the book.

MSA and LCCD Indices Comparison
Chart by oblasts of Ukraine

Top panels (captions):

Application of EEBIO Experience in Polar Regions

Application of EEBIO Experience in Carpathian Region: U. arctos habitats reconstruction

G.suaritus habitats reconstruction
Application of EEBIO Experience in Caspian Region:

Ukraine: Expected Landscape Ecosystem Diversity and Species Diversity Based on LCCD Approaches (ULRMC, 2005)

First GIS Agriculture Map Development Based on MODIS 2008