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only one or two levels of the system are considered; at least three levels of the system and their cross-scale interaction must be investigated. This spatio-temporal heterogeneity of forest ecosystem processes should be characterized at different scales. For that purpose, geostatistical and fractal methods for analyzing spatial structures, and spectral and wavelet analyses for the temporal patterns of the system were used to explore their cross-scaled dynamic interactions. The data sets for these analyses include water and minerals/chemical fluxes in soil. These data were collected from a beech forest, situated in the research site of the Bornhoeved Lake Area in Northern Germany, during the project "Ecosystem Research in the Bornhoeved Lakes Region," which is supported by the German Federal Ministry for Science and Technology. The results build a direct connection with a theoretical background based on hierarchy theory, and could be useful for ecosystem modeling and management.

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FEEDING BEHAVIOR, PREY PREFERENCE AND CONSUMPTION ABILITIES OF *DERAEOCORIS RUBER* L. (MIRIDAE: HETEROPTERA)

The ecological approach in the pest control requires the application of predatory and parasitoid species. The predatory bug *D. ruber* L. is regularly found in the fruit orchards of Southern Bulgaria. With the reduction of the pesticide treatments, this species gains greater importance for the biological regulation of some dangerous pests in the agroecosystems. The study was carried out in 1996-1997 under laboratory conditions in the insectarium of the Higher Institute of Agriculture, Plovdiv. The consumption abilities of the larvae of each instar and the daily consumption of the adults were studied. Data is given on the overall consumption for the entire larval development and adult's life. Several aphid species (*Aphis pomi* De Geer, *Hyalopterus pruni* Geoffr., *Myzus cerasi*, *Brachycaudus helichrysi*, *Myzus persicae*, and geometridae species *Erannis bajaria* Schiff. and *E. defoliaria* Cl.) have been offered. Their preferences for the different prey-species are discussed. The feeding behavior of the adults was monitored and described. The results could be used for the evaluation of the regulating abilities of the whole complex of beneficial in an orchard with IPM, or under the conditions of organic farming.

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ESTABLISHING A LONG-TERM, BROAD-SCALE ECOSYSTEM EXPERIMENT ON CLIMATIC VERSUS LITTER CONTROLS OF LITTER DECOMPOSITION

For the last eight years, the Long-term Intersite Decomposition Experiment Team (LIDET) has been examining the degree to which litter quality and climate influence the long-term decomposition and nutrient dynamics of decaying leaves and fine roots. We tested the control of these two factors by establishing a ten-year study at 28 sites throughout North and Central America. A total of 32 litter types were sent to these sites and samples have been examined periodically to determine the mass remaining as well as the change in nutrient content and carbon constituents. Preliminary analysis of the data (4-5 years of data have yet to be collected) indicate that both litter quality and climate influence decomposition, but only under optimum climatic conditions are the full controls of litter quality expressed. There is also strong evidence that the fraction of stable material formed by decomposition is highly correlated to the initial lignin content. This indicates that the previous assumption that a constant fraction of stable material is formed is not correct. The data generated by this project cover a much wider range of litter chemistries and climate than previously available. It will therefore be extremely useful in generating continental to global scale decomposition predictions.

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PERVASIVE SEED-DISPERSAL LIMITATION AND NEGATIVE DENSITY-DEPENDENT SEED-TO-SEEDLING TRANSITIONS IN A NEOTROPICAL TREE COMMUNITY

I compared the abundance and spatial distribution of seeds produced by trees in the species-rich, 50-ha Forest Dynamics Project plot of Barro Colorado Island, Panama to the abundance and spatial distribution of seedlings. Data for dispersed seeds come from a 10-yr seed-trapping project and seedling data come from four annual seedling censuses of 1m x 1m plots surrounding the 200 seed-traps. By comparing the species-specific seed-to-seedling transition-probabilities among sites receiving varying numbers of dispersed seeds, I simultaneously tested for dispersal-limitation and for negative density-dependence in this community of trees. Dispersal-limitation is evident in the fact that the probability that a given seed-trap had a seedling of a given species nearby was generally higher if the trap had received seeds of that species during the previous 10-year period than if it had not. Strong negative density-dependence is also evident in the much lower per capita recruitment probabilities for seeds landing in sites shared by many conspecific seeds than in sites with few conspecific seeds. In sum, for any given species, recruitment probabilities are low far from conspecific adults due to dispersal-limitation and are low near to conspecific adults due to negative density-dependence.

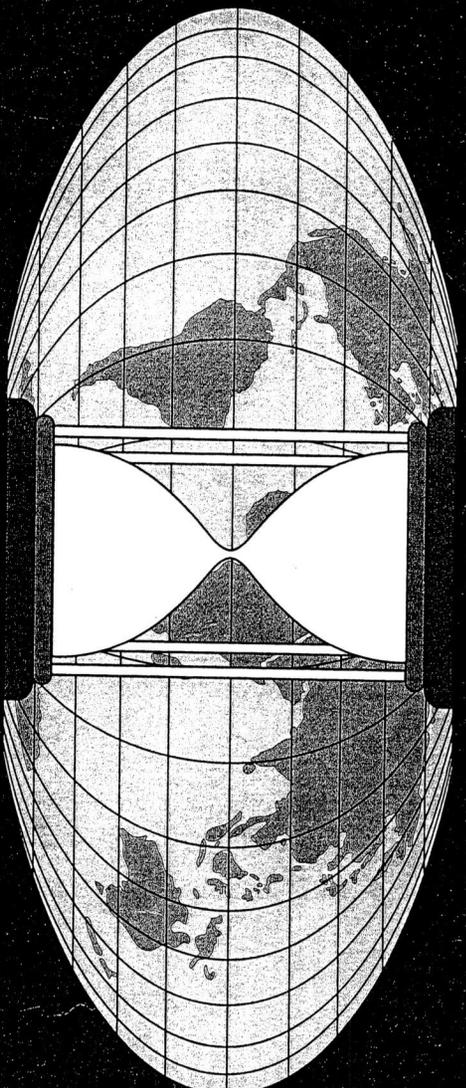
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PREDICTING FUTURE LANDSCAPES OF THE NETHERLANDS: A MODEL APPROACH

In the western part of the Netherlands, there is a strong pressure to extend the urban activities due to several economic factors. This means that a large open peatland area of special ecological interest, the so called Green Hart, will be increasingly threatened by urbanization. In this area, dairy farming predominates and the ecological value (meadow birds) is largely dependant on this land use. Scenarios for future landscapes have been developed for this area, taking into account different spatial patterns of urbanization. The consequences for nature were evaluated with a decision support system. The so-called LEDESS (Landscape Ecological DEcision Support System) links available landscape ecological knowledge to a geographical information system (GIS) to evaluate the scenarios. Both the data on the present situation (vegetation, soil, land use) and the data on planned and expected development of site condition, vegetation and fauna are handled in a grid with cells of 1 Km². The system provides a systematic way to use available ecological knowledge in evaluating the expected consequences of scenarios. LEDESS is based on a deterministic concept of the ecotope dependent on the physiotope, vegetation dynamics, target vegetation and management, and of faunal habitat requirements that are also dependent on vegetation structure. It also takes into account the accessibility of the landscape for migrating fauna species. It turns out that urbanization will deteriorate the existing fragmented landscape, which will cause further isolation and even local extinction of fauna species. As an answer to the scenarios of urbanization, different options for nature restoration have been proposed as compensation for the ecological loss and elaborated in additional scenarios. The consequences were evaluated again with the same computer model. The study concluded that fragmentation can be compensated to some extent by enlargement of habitats, but the effectiveness depends highly upon the spatial allocation of the new habitats.

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