Schulze, E.-D. (ed.): **Carbon and Nitrogen Cycling in European Forest Ecosystems.** (Ecological Studies 142.) - Springer, Berlin - Heidelberg - New York - Barcelona - Hong Kong - London - Milan - Paris - Singapore - Tokyo 2000. 500 pp., 183 figs., 106 tables, CD-ROM. Softcover DEM 98.00, CHF 86.50, GBP 34.00, USD 49.95. ISBN 3-540-67239-7.

The storage of carbon in forest ecosystems has received special attention in the Kyoto protocol of the Climate Convention, which attempts to equilibrate fossil fuel emissions with biological sinks. The reviewed book contains the results of the European Community projects NIPHYS (Nitrogen physiology of forest plants and soils) and CANIF (Carbon and nitrogen cycling in forest ecosystems) that were performed during the years 1993-1996 (NIPHYS) and 1996-1999 (CANIF). These projects aimed at studying key processes of the carbon and nitrogen cycles in coniferous (*Picea abies*) and deciduous (*Fagus sylvatica*) ecosystems along a north-south transect through Europe from North Sweden to South France and Central Italy.

The volume contains 20 chapters written by 63 contributors from the Czech Republic, Denmark, France, Germany, Italy, The Netherlands, Sweden, UK, and USA. The chapters are divided into 5 parts: Part A "Introduction to the European Transect" (2 papers) informs the readers, after short survey of recent knowledge of carbon and nitrogen cycles, on the two above-mentioned projects. Twelve main study sites, and nine complementary sites were chosen to represent a latitudinal, climatic and deposition transect in Sweden (Åheden, Norrliden, Stråsan, Andersby), Denmark (Skogaby, Klosterhede, Gribskov, Sorø), the Czech Republic (Načetín, Veveří, Salačova Lhota), Germany (Waldstein, Schacht, Wülfersreuth, Ebrach), France (Aubure, Thezan, La Clappe), and Italy (Collelongo, Monte di Mezzo, Renon). Every site was characterised by stand characteristics and site history, soil profile, field sampling, laboratory treatment, bulk density and soil pools, acid/base conditions, soil and ecosystem carbon and nitrogen pools, *etc.*

Part B "Plant Related Processes" presents 7 chapters dealing with tree biomass, growth and nutrient pools, linking plant nutrition and ecosystem processes (net primary production, foliar analysis, dry mass under various mineral element content, nitrate and amino acid partitioning, ecosystem carbon and nitrogen pools), root growth and response to nitrogen (root growth, methods using root windows and soil coring, *etc.*), nitrogen uptake processes in roots and mycorrhizae (nitrogen uptake process, studies with excised roots and mycorrhizae), the fate of ^{15}N-labelled nitrogen inputs to coniferous and broadleaf forests (ecosystem partitioning of ^{15}N-labelled ammonium and nitrate), canopy uptake and utilisation of atmospheric pollutant nitrogen (pathways, approaches to determination, ecophysiological consequences), and biotic and abiotic controls over ecosystem cycling of stable natural nitrogen, carbon, and sulphur isotopes (approaches to study, ammonium and nitrate in wet deposition, and stable isotope signatures).

Part C "Heterotrophic Processes" (6 chapters) deals with soil respiration (controlling factors, annual budgets, carbon balance, annual carbon and nitrogen fluxes in soils using ^{14}C bomb, carbon mineralisation in soils, litter decomposition, soil nitrogen turnover, nitrification and denitrification, and nitrogen and carbon interactions of forest soil water).

Part D "Diversity-Related Processes" (3 chapters) is devoted to the role of microorganisms (endomycorrhizae, ectomycorrhizae, bacteria, fungi, microfauna, mesofauna, *etc.*) in decomposition processes.

Part E "Integration" (2 chapters) deals with spatial variability and long-term trends in mass balance of nitrogen and sulphur, model analysis of carbon and nitrogen cycling (model calibration and verification, carbon allocation, reserve pools, and mortality, actual plant assimilation, net ecosystem productivity, *etc.*), and interactions between the carbon and nitrogen cycles and the role of biodiversity (limits of carbon and nitrogen fluxes in forest ecosystems, net biome productivity, *etc.*).

The attached CD-ROM provides a complete database of all flux, storage, and species observations for modellers, organised in three parts: *1*) Figures (*pdf* files), and figure data and tables of the chapters (*ASCII* files) are presented in separate files for each chapter. *2*) The field data that are basis for the assessment are presented in separate files for each study site (tree species, field-layer vegetation, soil and soil chemistry data, and hydrology, climatic conditions and deposition data). *3*) Data on abundance and diversity of soil fauna, soil microfungi, and mycorrhizae, ordered by groups of organisms. Each file contains data for several sites. Additionally, slides illustrating the sites or techniques are including on *jpg* files.

Generally, the book is an excellent source of recent information on the field studied. Each chapter contains methodological part, and is accompanied by a list of references (together almost 900 citations). The book is well edited and produced, and is provided by subject and species indexes. It can be recommended to ecologists, plant scientists, soil scientists, microbiologists, as well as to everybody interested in present and future impacts of global climate change on biosphere.

J. ČATSKÝ (*Praha*)