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Part Two:

ABSTRACTS

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"***Ecologists/Biologists** as Problem Solvers"*

PARTICIPATING SOCIETIES

American Society of **Naturalists,** Association for Tropical Biology

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Cover Design: Potential natural (Supplement to ESA **Bull.** 763, Part One) and current (ESA Bull. 763, Part Two) vegetation for Northeastern United States. Potential vegetation map based on **10-km gridded Küchler** (1964) U. S. map from **NOAA/EPA Global** Ecosystems Database Version 1.0, **Disk** B (National Geophysical Data Center, Boulder, CO, *In* press). KOchter vegetation classes were aggregated to those used In the **Vegetation/Ecosystem** Modeling and Analysis Project **(VEMAP;** VEMAP Members, 1995, Global **Biogeochem.** Cycles, **9:407-437; Kittel** et **al.,** J. **Biogeography,** v. 22. In press; World **Wide** Web URL: **http://www.cgd.ucar.edu:80/vemap/).** Current land map Is based on the EROS Data Center land cover **dataset (Loveland** et al. 1990), reclassified to VEMAP vegetation classes **(Kittel** and **Ojima,** pers. **comm.).** Figure prepared by Hank **Fisher,** National Center for Atmospheric Research; thanks also to Brian **Newkirk.** Vegetation types are: Boreal **(Subalpine)** Coniferous Forest (Dark Green); Cool Temperate Mixed Forest (Green); Warm **Temperate/Subtropical** Mixed Forest (Yellow); Temperate Deciduous Forest (Orange); Northern Hardwood Forest & Northern (Light Green Pattern); Temperate Deciduous Forest & Com Belt **(Pink);** Temperate Deciduous Forest & **Southern** Com and Mixed Crop (Maroon); Warm **Temperate/Subtropical** Mixed Forest & **Southern** Com and Mixed Crops (Purple).

NAIMAN, ROBERT J.. JOHN J. **MAGNUSON,** and PENELOPE L. FIRTH. Center for **Streamside** Studies, University of **Washington,** Seattle, WA **98195,** USA; Center for Limnology, University of Wisconsin, **Madison, WI** 53706, USA; and National Science Foundation, Arlington, VA 22230, USA. Integrating cultural, economic, and **environmental** requirements for fresh water.

Fresh water is a **strategic** resource that structures natural and cultural landscapes and determines regional economies and demographic patterns. With the unprecedented increase in human populations, water consumption has doubled since 1940 and is likely to double again within the next 20 years with concomitant Impacts on **groundwaters,** wetlands, streams, lakes, and rivers. Understanding the abilities and limits of freshwater ecosystems to respond to human-generated pressures has become a central issue for societal stability and ecological vitality. **"How** to protect environmental and human **needs"** is an issue that scientists and decision makers must address jointly; it is a critical national, continental, and global priority. The complexity of **tha** issue and its resolution exceeds the capacity of any single institution to encompass. Our Introduction provides an overview of how fresh water will influence human and environmental characteristics over the next two decades. We examine the complexity of the issue from environmental and social perspectives, provide regional-scale examples where integrated approaches are being tested, and address innovative approaches and technologies used in this integration.

NAKAMURA, ROBERT R. and CARLOS ROBLES. California State **University,** Los Angeles, CA **90032-8201,** USA. Using Urban Environmental Issues to Motivate Interdisciplinary Science Studies.

Environmental science progresses through the work of teams from many disciplines. We motivate urban students from under-represented groups to develop multidisciplinary perspectives in research by focusing on local environmental issues that affect their lives. For example, undergraduates studied a disastrous incidence of **DDT** pollution off the coast of Los Angeles. In an environmental biology class they collected fish samples from contaminated and **uncontaminated** sites; any lesions on the fish were recorded. In a chemistry class students measured the concentrations of DOT in the fish tissues. A biometrics class used the data to compare fish from the different sites. Thus, students conducted research in biological oceanography, organic chemistry, statistics and social policy as they proceeded through the curriculum. Subsequently, students expressed greater confidence in their knowledge of ocean pollution and greater interest in environmental science careers. Other **student** exercises examined seasonal changes in ozone levels and clover growth, and links between urbanization and the fate of black walnut populations. A home page disseminates over the Web course modules and the results of student research.

NANTEL, PATRICK and D. GAGNON. **Universite** du Quebec a Montreal, C.P. 8888, **succ. Centre-Ville,** Montreal, Quebec, CANADA, H3C 3P8. Evidence of greater variability in the population dynamics of peripheral plant populations.

Local populations of plant species at the edge of their distribution range are hypothesized to be more susceptible to extinction. Greater variability in demographic parameters should be observed in **peripheral populations,** leading to higher minimum viable population (MVP) sizes and increased extinction probabilities. These hypotheses were tested in a study of 2 northern peripheral and 2 non-peripheral populations (total of 4 **pops.** each sp.) of the woodland sunflower **(Helianthus divaricatus)** and the fragrant sumac (Rhus **aromatica).** Both of these **clonal** species usually occur in openings created by fire. Study areas were in south-western Quebec (Mean Annual T.: **5.2°C)** and in southern Ontario (M.A.T.: 8.0°C). Two transition matrices (3 years of study) were obtained for each population **(200-300 ramets** each). Results for both species show similar population growth rates (LAMBDA) but greater temporal and spatial variability in LAMBDA and demographic parameters, as well as considerably larger MVP sizes in the peripheral populations. All of these factors create higher extinction probabilities for the peripheral populations. As a result, both species studied occur in fewer populations, or become rare, at the periphery of their range.

NARO, EUGENIA F. **S. ,** N. **MROSOVSKY** and M. A. MARCOVALDI. Yale University, New Haven, CT 06520, USA, University of Toronto, Toronto, ON. M5S **1A1,** CANADA, **Projeto** TAMAR, BA, 40.210-970, BRAZIL. Thermal Profiles of Marine Turtle Hatcheries and Nesting Areas at Praia do Forte, Brazil.

Sand temperatures at sea turtle nest depth were taken In both **open-air** hatcheries and natural nesting areas at Praia do Forte, Bahia, Brazil. The aim of this study was to determine if incubating turtle eggs in hatcheries was likely to affect the local population's sex ratio. Incubation temperatures have been found to influence percentages of males and females in marine turtles and in many other reptiles known to have temperature-dependent sex determination **(TSD).** The mean sand temperatures at 30 and 60 cm. depths in the hatcheries were not significantly different from those in natural areas with similar characteristics over the five-month study period. The slightly higher ranges in temperature in one of the hatcheries that was irrigated were unlikely to have had major effects on sex ratio. Nest transferal off the beach into open-air hatcheries at Praia do Forte probably had very minor effects on the sex ratios of the hatchlings.