aterial processing, little
luent streams of arid
:ion of Sycamore Creek,
en subsystems during
We injected bromide
: surface water,
; differed both within
low from surface water
sharply with those
were influenced by

FROM RIPARIAN
partment of Fisheries

r objectives were: (1)
in two riparian
o adjacent streams.
r, northeast Oregon.
and towards the
its through three plant
)w ground water from
d seasonal changes in
nitrogen were lowest
and 4 mg/l,
than in the stream,

'IC STREAMS.
Jevada - Las Vegas,
:s, AK 99775

:entral Alaska.
ıg an end-member
rface discharge was
19% underlain by
:rate concentration
; dissolved organic
ıtion in subsurface
veraging 566 and 633
; µgN/L. DOC
d 7.1 mgC/L than in
nputs into sub-arctic
onments.

H.M. Valett[2].
artment of Biology,
villeta.unm.edu

Surface-subsurface
as benthic retention.
; representing a
). To assess the
de) and nitrate
hloride data. Nitrate
e of uptake
f A_s/A also had the
Three of the 4 sites
Even for streams
: intervals likely

(302) HYDROLOGIC VARIABILITY, ORGANIC MATTER SUPPLY, AND DENITRIFICATION IN THE GARONNE RIVER ECOSYSTEM. M. Baker[1], P. Vervier[2], and L. Roques[2]. [1]Department of Biology, Utah State University, Logan, UT, USA 84322, [2]CESAC, CNRS/UPS, 29 rue Jeanne Marvig, Toulouse, France 31055 mbaker@biology.usu.edu

Groundwater nitrate contamination has become a worldwide problem as increasing amounts of nitrogen fertilizers are used in agriculture. Alluvial groundwater is uniquely juxtaposed between soils and streams. Hydrologic connections among these subsystems organize nutrient cycling. We hypothesized that spring floods would flush soil-derived dissolved organic carbon (DOC) into groundwater, and this would in turn fuel denitrification in a nitrate contaminated portion of the Garonne watershed. In situ acetylene block assays and measures of system biogeochemistry and hydrology were used to test this hypothesis. During high flow (mid-April to early June) the water table rose an average of 30 cm in monitoring wells. This was associated with a slight increase in DOC concentration. Denitrification rates nearly doubled during the high flow period, averaging 2.91 &mu N_2O/L/min during baseflow compared to 5.05 &mu N_2O/L/min during spring flood. Higher denitrification rates during spring appeared to be related to a change in DOC quality. While there was no seasonal difference in specific UV index, low molecular weight organic acids made up a greater proportion of DOC during high flow. These molecules are likely derived from decomposition of soil organic matter and are an important energy source for anaerobic respiratory processes like denitrification.

(303) CONTROL OF DIN EXPORT FROM SMALL WATERSHEDS BY HEADWATER STREAM NITROGEN PROCESSING. B.J. Peterson[1], W.M. Wollheim[2], P.J. Mulholland[3], J.R. Webster[4], J.L. Tank[5], J.L. Meyer[6], N.B. Grimm[7], E. Marti[7], W.B. Bowden[8], J. Merriam[9], H.M. Valett[4], A.E. Hershey[10], W.H. McDowell[9], W.K. Dodds[11], S.K. Hamilton[12], S.L. Johnson[13], L.R. Ashkenas[13], and D.J. D'Angelo[14]. [1]The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA 02543, [2]Complex Systems Research Center, University of New Hampshire, Durham, NH 03824, [3]Environmental Science Division, Oak Ridge National Laboratory, PO Box 2008, Oak Ridge, TN 37831-6036, [4]Department of Biology, Virginia Tech University, Blacksburg, VA 24061, [5]Department of Natural Resources and Environmental Sciences, N-411 Turner Hall, University of Illinois, 1102 S. Goodwin Ave., Urbana, IL 61801, [6]Institute of Ecology, University of Georgia, Athens, GA 30602-2602, [7]Department of Biology, Arizona State University, Tempe, AZ 85287-1501, [8]Landcare Research, PO Box 69, Lincoln 8152, New Zealand, [9]Department of Natural Resources, James Hall, Durham, NH 03824, [10]Department of Biology, University of North Carolina - Greensboro, Greensboro, NC 27402, [11]Ackert Hall, Division of Biology, Kansas State University, Manhattan, KS 66506, [12]Kellogg Biological Station, 3700 E. Gull Creek Dr., Hickory Corners, MI 49060, [13]Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331, [14]The Proctor and Gamble Co., Experimental Stream Facility, 1003 Route 50, Milford, OH 45150-0356 "bruce peterson<PETERSON@MBL.EDU

We used the Lotic Intersite Nitrogen eXperiment (LINX) project data base on ammonium uptake, nitrate uptake, nitrification, and net inorganic nitrogen regeneration from stream bottoms to calculate how in-stream processes can alter NH_4 and NO_3 concentrations in headwater streams. A spreadsheet model was used to predict how seepage water nutrient concentrations would be changed by these in-stream processes. The data on rates of each process were used to explore how sensitive export concentrations were to variations in the intensity of each process. In the average case (mean LINX kinetics) seepage waters entering the small stream channel were assigned concentrations of 20 µg/l and 50 µg/l for NH_4 and NO_3 respectively. The predicted stream water concentrations at 1 km from the stream origin were 3 µg/l NH_4 and 21 µg/l NO_3. In this case about 67% of the DIN input would be retained or transformed by the headwater stream. Exploration of the ranges of kinetics across all LINX streams produced DIN retention estimates ranging from 0 to 88% of inputs.

(304) AMMONIUM UPTAKE BY HETEROTROPHIC MICROBES, NITRIFIERS, AND ALGAE IN A MIDWESTERN U.S. STREAM. S.K. Hamilton[1], J.L. Tank[2], D.F. Raikow[1], and W.M. Wollheim[3]. [1]Kellogg Biological Station, Michigan State University, Hickory Corners, MI 49060, [2]Dept. Natural Resources and Envir. Sciences, University of Illinois, Urbana, IL 61801, [3]Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA, 02543 hamilton@kbs.msu.edu

Rates of assimilative and dissimilative uptake of ammonium in a second-order forested stream in southern Michigan were quantified during a whole-stream 15N enrichment, as part of the Lotic Intersite Nitrogen Experiment (LINX). The 6-week addition occurred in June and July 1998. N isotope enrichment was measured in ammonium, nitrate, and all organic compartments. Algae were separated from bulk epilithon by density-gradient centrifugation and microbial N was extracted from bulk detritus by chloroform fumigation to measure the isotope ratios of these fractions. Ammonium uptake lengths ranged from 766-1349 m. Uptake during the first week was partitioned into nitrification (57%) and assimilative uptake by heterotrophic bacteria and fungi associated with detritus (29%) and by algae in epilithon (14%). Microbial N in detritus and algal N in epilithon appeared to reach isotopic steady state with water-column ammonium, but the isotopic enrichment of the bulk detritus and epilithon did not approach that of ammonium due to a large fraction of organic N that was not involved in uptake. Nitrate uptake could not be detected. These results provide insights into the heterotrophic nature of temperate woodland streams during the summer and reveal that ammonium transformation by nitrification is important relative to assimilative uptake.

48th ANNUAL MEETING - Keystone Resort, Colorado

NABS 2000

May 28–June 1, 2000

Members of the North American Benthological Society and other interested persons are invited to the 48th Annual Society Meeting to held in Keystone Resort, Colorado, USA.

The NABS' annual meeting has established a reputation, not only for its camaraderie, but also for the high quality of its program and presentations.

In keeping with this tradition, the NABS 2000 Program Committee has assembled a record number of presentations for your science pleasure! So, get ready to pack your bags and head out to the high country!

♦ **Taxonomy Faire**

Given the success of the **Taxonomy Fair** in Duluth, led by **Dave Penrose**, the Technical Information Committee is sponsoring another Faire at Keystone during the poster session on Wednesday afternoon, May 31st. The "Faire" format consists of taxonomy stations, each manned by a recognized expert of a taxonomic group. Participants are free to bring their own specimens to these expert stations and are able to gain personal access to the gurus of aquatic invertebrate taxonomy. Bring your vials and slides!

♦ **SPECIAL WORKSHOP ON NATIVE AMERICAN ISSUES**

The NABS Human Resources Committee will be hosting a workshop Sunday, May 28th, at the 2000 Keystone meeting will feature issues related to water quality and monitoring on tribal lands. Please visit the NABS website or contact Judy Li for more information.