



**Eric S. Nagy, Ph.D.**  
*Associate Director*

Dr. Janet Poley, President  
American Distance Education Consortium  
C218 Animal Science Building  
Lincoln, NE 68583-0952

June 26, 2007

Dear Dr. Poley,

Thank you very much for your invitation to participate in, and contribute to, your ongoing project and efforts to research, develop, and apply exciting new wireless networks, sensor systems, and educational products in collaboration with the Organization of Biological Field Stations (OBFS). As an active member in the field station community, and a Past President of OBFS, I am convinced the partnership you are forging will be extremely productive and mutually beneficial. The goal of developing real time data channels originating in the field, and feeding into accessible and standardized research, education, public policy, and other applied product tools is one of the very highest priorities for field stations in the US, North America, and across the globe. Perhaps the most prominent embodiment of this priority is the ongoing NSF effort to establish NEON (the National Ecological Observatory Network). Your project could not be more timely in its capacity to dovetail with NEON efforts and the huge advances in wireless sensor networks currently underway at field stations across the country. Your own track record in communications technology and the expansive collaborative network you already have among academic institutions of all types, and especially your strong and unique relationships with Tribal Colleges, EPSCoR institutions, and other underserved groups makes this collaboration all the more exciting. It is especially thrilling to see the collection of OBFS member field stations you have on line here as formal collaborators. These stations are the acknowledged leaders in field station wireless technology development, and are all eager for collaborative expertise that can help them both expand their capabilities and develop valuable products with the data they collect.

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As the OBFS liaison with your project I can also confirm the endorsement of this cooperation by the OBFS Executive Board and promise our active effort to identify additional field stations interested in participating in the project.

The Mountain Lake Biological Station (MLBS) is of course honored to be one of the cooperating stations in this ADEC initiative. Compared to other stations, MLBS is still at the very beginning of its efforts to develop real-time wireless sensor systems. That said, we are currently in a rapid growth phase and look forward to education, outreach, and research oriented data streams in the very near future. The southern Appalachians are rich in land use history and environmental research. Unfortunately very little spatially and temporally intensive monitoring is on line in this region that could help educate the public or inform research models about the extremely dynamic processes involved in global climate change, acid precipitation, insect and plant invasions, and rapid shifts in biodiversity we all know are occurring in this region. Programs like NEON will help in this area, and MLBS is a cooperating station in the NEON Domain 7 planning effort. Cooperating in the ADEC project would also be invaluable in helping generate the kind infrastructure and data so desperately needed.

What can the ADEC partnership do for MLBS? As is the case for many biological field stations, MLBS is constrained by equipment dollars and expertise hours. We are a well established full service residential field station, rich in basic infrastructure, environmental resources, and matching support from our parent institution (University of Virginia). As MLBS came under new directorship in the fall of 2006, the mission of the station expanded broadly in both the outreach and public service arenas. We also became committed to the development of on-line data systems presently lacking. Commitment to both goals is reflected in University and NSF investment in a recently funded NSF FSML (DBI) grant for facilities improvement (2 year \$500K project). The ADEC partnership offers us the opportunity to cooperate in development and deployment of network systems we'd be unable to pursue on our own.

Current Capacity. MLBS is currently served by a single frame relay T1 circuit to the Internet. The circuit is carried by a fiber optic cable to the top of the mountain (8 mile, 2,000ft elevation climb from local telco). The last 2 miles to the station is covered by antiquated copper cable prone to damage by frequent and intense electrical storms. The single T1 circuit is also near capacity. The main campus of the field station is composed of 29 buildings and is served by a single class C subnet (255 addresses) and a Windows 2000 domain. High speed (100mbps) Ethernet switches and CAT5 cabling cover all lab buildings; 10 wireless access points chained together provide coverage to residences and the immediate field environment. The LAN is well shielded with filters, regulators, and backup power supplies from the very dirty single phase "end of the line" grid power supply. Local infrastructure is relatively new, strong, and designed for expansion.

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Highest Priority Needs. 1) Additional and more robust T1 circuits, or an alternative solution for broadband connectivity (eg. wireless bridge to Virginia Tech?, satellite, fiber optic cable for the last 2 miles to station). 2) Creative solutions to expanding wireless converge into the heavily forested field research areas. Hybrid cabled/wireless (900MHz) infrastructure may be most effective. 3) Network engineering support and expertise. 4) Programming and database expertise. 5) Program development and outreach support. We are eager and well positioned to expand out network into the field and deploy a wide array of experimental and environmental monitoring sensors. ADEC cooperation would give us the access to the expertise within ADEC and at other field stations we sourly need to expand both our network capacity and product development.

Mountain Lake Biological Station is extremely eager to engage with ADEC and other field stations in data sharing, IT expertise, and product development. We have the desire and on-site infrastructure to support significant expansion and R&D efforts. We are especially eager to participate in educational and public outreach efforts. MLBS is located in a rural Appalachian county that could benefit hugely from educational and public service efforts. We are also ideally situated 30 minutes from the major land-grant institution Virginia Tech. and Blacksburg Virginia, home of the cutting edge networking and outreach initiative "Electronic Village." Our position "on the edge" makes us well suited to bridging research and education gaps locally and nationally. We look forward, wholeheartedly, to working with you on this project.

Sincerely,

Eric S. Nagy  
Associate Director, MLBS  
Past President, OBFS

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