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Media Relations

UNH Science Program Spawned By Challenger Disaster Celebrates 20 Years

January 27, 2011

DURHAM, N.H. -- Had the Space Shuttle Challenger tragedy not taken the life of the first "teacher in space," Christa McAuliffe of Concord High School, it is likely that NASA scientist Barry Rock would never have landed at the University of New Hampshire or helped create Forest Watch, the innovative science program that, 20 years later, is a living tribute to McAuliffe's legacy as a dedicated teacher.

Started five years after the January 28, 1986, Challenger disaster, UNH's Forest Watch program engages K-12 students in the process of doing real science through the collection and processing of data relating to air pollution damage in forest stands in New England. Under Rock's direction for two decades, Forest Watch has demonstrated that students can collect valuable data for ongoing scientific research and learn science and mathematics by doing research in their local area. Student data have clearly shown how responsive white pines are to year-to-year variations in ground-level ozone (smog).

"Christa's dream was to have students learn about their home planet by studying it from space," Rock says, "and Forest Watch has allowed students across New England to do just that – learn about the health of their own trees by measuring them both from space and from hands-on measurements."

Rock, a botanist by training and an expert in using remote sensing techniques to study biophysical properties of trees, has used the student-generated Forest Watch data in his own research at UNH, where he arrived in 1987 from NASA's Jet Propulsion Laboratory (JPL). He had been doing shuttle-based remote sensing work at JPL but after the Challenger explosion all shuttle missions were grounded for a period of years, and Rock's JPL research came to a screeching halt.

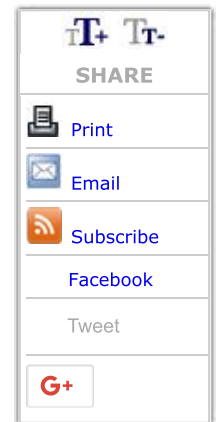
On his first day at UNH he found a stack of mail forwarded from JPL and on top was a letter from Concord High teacher Phil Browne, a colleague of McAuliffe's. In the wake of the Challenger explosion Browne had fired off letters to hundreds of NASA scientists in an effort to get the agency to do something to restore the faith of science students devastated by the loss of their teacher and discouraged over what they saw as a failure of NASA. Rock, the only scientist to respond, gave Browne a call and the rest is history.

To date, students and teachers from 258 schools in all six New England states have collected white pine needle samples annually at school-based study plots from 1,767 trees totaling 6,994 samples. White pine is known to be a bio-indicator species for exposure to smog. Sampling includes three different spectral measures of tree health taken with a spectrometer at UNH and 25 different biometric measures made by students, who in many cases compare the spectral and biometric data to NASA satellite images of their own school plots and surrounding areas. NASA's New Hampshire Space Grant Consortium has sponsored Forest Watch since 1991.

The resulting 196,132 data points have provided UNH researchers, teachers and their students with a unique 20-year record of white pine growth and inter-annual responses to ground-level ozone. The program provides teachers and students with a school-based statistical data set for use in calculus, statistics, and other math courses, as well as biology, chemistry, and other science applications.

Says Browne, who has been an integral part of the program throughout its history, "This is a chance for kids to do real science, it's not just cookbook, follow-the-lab manual stuff. Every year, their data is published, and they realize they can be part of developing awareness of environmental problems and how those problems can be solved through their help."

Rock also notes that the Forest Watch model was used to create the Global Learning and Observations to Benefit the Environment or GLOBE program, started by former vice president Al Gore, and for which Rock



served as the first senior scientist. Through GLOBE, well over one million students globally have also shared in McAuliffe's "dream" by using NASA Landsat data to study their own piece of the world.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.

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