

Schoolyard LTER Supplement - Palmer Long-Term Ecological Research Education Plan Development in Support of Schoolyard LTERs Raymond C. Smith, PI and Karen S. Baker, Co-PI - 12 March 99 1.0 Introduction This proposal is a supplement to the original LTER Palmer proposal (Smith et al., 1996) and, as with our 1998-99 LTER Schoolyard Supplement, incorporates Antarctic marine science and emphasizes the value of long term research. This supplement proposal requests funds to continue developing a Palmer LTER schoolyard education plan by developing existing relationships and programs, holding mini-workshops or meetings, and planning prototype programs. Each prototype project will interface with local schools and teachers to develop schoolyard LTERs and to identify "kid-engaging" observations that are relevant to local communities and sustainable within the school's existing programs and policies. Potential student links to our Southern Hemisphere research include on-line LTER climate data, a schoolyard weather station and Southern Ocean drifter tracking. Coordination with the LTER information management and Palmer data manager will emphasize the importance of long term data and information synthesis. Student interactions with scientists through inquiry-based use of long-term data will bring the excitement of real-world science to the classroom.

2.0 Approach The ultimate goal is to establish self-sustaining schoolyard LTERs that include classroom presentations, field measurements, data handling and inquiry-based analyses incorporating long-term data sets from other schools and/or several LTER sites. Sustainable schoolyard LTERs require a high level of understanding and cooperation among LTER PIs, local school authorities and, especially, local teachers. Given ongoing standards implementation, lack of curriculum integration across grades and schools, the classroom constraints with respect to time and curriculum materials, the range of teacher interest and professional development, we plan to develop, with teachers and educators, approaches that can augment existing classroom curricula. This permits a practical "sustainability through compatibility" philosophy. TO DRAW UPON ESTABLISHED CURRICULAR PROGRAMS which are currently administration-approved and classroom-functional, we will explore collaborative on-going programs that already exist among Santa Barbara schools, the Santa Barbara Natural History Museum and the National Center for Ecological Analysis and Synthesis (NCEAS) as well as with San Diego schools, the Birch Aquarium at Scripps Institution of Oceanography, the University of California at San Diego and the San Diego Supercomputer Center. A FOCUS ON WEB COMMUNICATIONS will enhance long-distance collaborations and introduction of existing Antarctic online materials that compliment presentation of Palmer LTER materials. Such web resources include the Palmer LTER website, ongoing NSF (GLACIER, TEA) and NASA (Passport to Knowledge, GLOBE) and ONR/DOE (National Oceanographic Partnership Program Year of the Ocean) national programs, the existing NCEAS online 'Kids Do Ecology' program supporting fifth grade student classrooms and the Birch Aquarium's Teacher On Board with INDOEX. Curriculum developments will be modular and online so that scientists and teachers can participate as science themes or funding opportunities develop (ie ice, GIS, modeling). TO DRAW UPON TEACHER EXPERTISE we will identify teachers in schools where Palmer LTER PIs are already involved as parents or mentors. A unique resource for us is Besse Dawson, a Texas High School Science Department chair and past participant in Palmer field work through NSF's Teachers Experience Antarctica Program. Dawson will help develop a meeting forum to forge a working partnership and define an education plan. Additional PI/teacher teams will be added to our partnership as important elements of future cross-site projects. Partnerships with other sites will capitalize upon ongoing scientific collaborations by focusing on common themes such as weather and ice. Working with PIs and Data Managers at various sites, we will identify methods so that personnel from a long-term research site can present and facilitate schoolyard programs centered upon hands-on field experience as well as hands-on data handling. Further we will continue to work with both the LTER Network Office and with the LTER network of sites to co-ordinate methods and approaches. A WORKING GROUP FORUM of participants will review existing programs and discuss a comprehensive plan, an activities list, potential pilot programs and available datasets. This working group will help in recruiting teachers and program affiliates interested in classroom/teacher/scientist team development. We will focus on the value of the mentor relationships between classroom students and teachers with informal educators and scientists, and explore having teachers intern with local scientists in order to develop units relevant to needs of both teacher and scientist.

3.0 Budget and Budget Justification The time required to interface between an academic research arena and a K-12 educational site is significant. As a result a major portion of these initial funds will be used to support an effective interface in terms of both personnel and communications. Appropriate part-time personnel and an informal science educator with scientific writing/editing expertise will coordinate with the Palmer LTER program and interface with institutions and K-12 schools interested in including a unit on long-term research within their curriculum. University students can work with PIs and teachers to make data base management and computer linkage a reality. An active, ongoing REU program may be tapped for some outreach to schools. An important fraction of the budget will pay for communications in the form of travel as well as stipends for teachers, instructors and students. Travel to

meetings such as the annual American Association for the Advancement of Science or the upcoming LTER all-science meeting 2000 will be arranged. University students will work with our information manager (Karen Baker) and with other education partners. A portion of the budget will be used to provide materials and supplies required in support of local measurements and interfaces.