

Schoolyard LTER Supplement 9900 - Palmer Long-Term Ecological Research Education Plan Development in Support of Schoolyard LTERs Raymond C. Smith, PI and Karen S. Baker, Co-PI 1.0 Introduction This proposal is a supplement to the original LTER Palmer proposal (Smith et al., 1996) and, as with our 1998-99 and 1999-2000 LTER Schoolyard Supplements, incorporates Antarctic marine science and emphasizes the concept of long term research. This supplement proposal requests funds to continue developing a Palmer LTER schoolyard education plan through support for outreach projects initiated by teachers involved with the Palmer LTER over the last two years. The Palmer LTER education web page contains an overview of outreach efforts (<http://www.ices.ucsb.edu/lter/education>) to date including projects, working groups, publications, milestones and teacher-on-board programs.

2.0 Approach The ultimate goal is to establish self-sustaining schoolyard LTERs that include classroom materials, field measurements, data handling and inquiry-based analyses incorporating long-term data sets from other schools and/or other LTER sites. Sustainable schoolyard LTERs require a high level of understanding, cooperation and organization among LTER PIs, local administrations and local teachers. We plan to continue use of the very practical "sustainability through compatibility" strategy by focusing on partnerships where we can augment existing classroom curricula and education programs. A FOCUS ON COMMUNICATIONS and OUTREACH PRODUCTS will enhance our long-distance collaborations. The Palmer LTER Associates is a group formed in response to interest shown at a recent Palmer LTER education workshop. A mailing list has been created to facilitate communications within this group and Palmer LTER materials will continue to be distributed to group members. Web pages, used for specific project communications, will be used for general outreach as well. TO DRAW UPON TEACHER EXPERTISE we will again identify teachers in schools where Palmer LTER PIs are already involved as parents or mentors. Several unique resources are available to the Palmer LTER because of its collaboration with the NSF Teachers Experiencing Antarctica program. Karen Baker, the Palmer LTER Information Manager and a recent addition to the TEA Advisory Board, will continue to interface with the TEA Project. Topics of common interest include development of optimum forms of outreach, communications among LTER sites and TEA, as well as program evaluation instruments. Besse Dawson, a Texas High School Science teacher, participated in the Palmer LTER 1998 research cruise. Under last year's funding, Dawson and LTER PI's have summarized her Palmer LTER TEA experience for the Antarctic Journal. Dawson plans to return to the field next year with TEA support if possible which will enrich her interface with our Antarctic project. Our current TEA Mimi Wallace has initiated a suite of exciting projects which will require further support to develop into ongoing outreach rather than one-time outreach activities. We are fortunate that Mimi Wallace's Synergy Team colleague with expertise in technology has applied to the TEA program for the 2000-2001 season. The intention is to both continue their high school team's development of Antarctic inquiry based activities and to coordinate activities with another nearby LTER. TEA PROJECTS REQUIRING SUSTAINED SUPPORT The TEA program provides support for teachers to visit the field but this requested LTER supplement will provide the support needed to continue communications with teachers who have interned with our research group and to develop the full range of field activities inspired by teachers who have been in the Antarctic. The following is an example of some of the activities initiated this year which appear promising for sustained support: -An Antarctic electronic virtual tour including 360 degree panoramas of the Palmer LTER research vessel, the Palmer Station, and the Palmer area penguin rookeries has begun. It is a modular product so additions from subsequent teachers are possible. -Palmer LTER Outreach Trunks filled with pertinent materials such as books, posters, videos, CD's and journal publications will be created. This resource treasure chest will be shipped to Palmer Associates on a request basis. The idea will be promoted as a potential cross-site activity with the goals of having LTER site education associates able to request Outreach Trunks from other sites. -Antarctic artifacts collected this season will be added to the Palmer LTER Outreach Trunk. -A bibliographic catalog for the Outreach trunk will be created and an online version design considered. -Presentation materials such as an outreach poster for the LTER All Scientist Meeting and a Palmer LTER Education Outreach prototype CD, will be made. -Palmer LTER Outreach Survey of Scientists will be evaluated after analysis of surveys returned from the 2000 season. -Penguin colony lottery project summary analysis will be done and this season's individual penguin adoptions by classroom students summarized. -This season's mentorships between classroom students and teachers with informal educators and scientists will be considered in order to optimize next season's program. -Palmer LTER database use by students this year will be summarized and further database use facilitated. Curriculum developments will be modular and online so that scientists and teachers can participate as science themes or funding opportunities develop (i.e., ice, GIS, modeling). Several data sets and modeling approaches will be reviewed by classroom teachers and discussed in a workshop setting. TO PARTNER AND COORDINATE WITH ESTABLISHED PROGRAMS which are currently administration-approved and classroom-functional, we will continue ongoing collaborations and seek partnerships with technology and education centers. We will continue to

explore with on-going programs among Santa Barbara schools, the Santa Barbara Natural History Museum and the National Center for Ecological Analysis and Synthesis (NCEAS) as well as among San Diego schools, the San Diego County Technology center, the Birch Aquarium at Scripps Institution of Oceanography, the University of California at San Diego and the San Diego Supercomputer Center. Partnerships with other sites will focus on common themes such as field measurement comparisons or weather and ice data sets. Projects developed through this years TEA field experience will be considered for interface with the existing NCEAS online 'Kids Do Ecology' program supporting fifth grade student classrooms. 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. Attendance at the second LTER Education Workshop at Kellogg Biological Station for two Palmer LTER participants (K.Baker and D.Rawls) provided insight into broadening future education coordination and collaboration. A WORKING GROUP FORUM of participants will review existing programs and update ongoing outreach plans. Selected working meetings between Palmer LTER participants, teachers and educators will provide the much needed time to focus on project planning and synthesis. Past activities lists will be updated and prototype activities evaluated. We will have a teacher 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 funds will be used to support an effective interface in terms of personnel time 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. An important fraction of the budget will pay for communications in the form of travel as well as stipends for teachers, scientific editors 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 supported. A portion of the budget will be used to provide materials and supplies for education products and for support of local measurements and interfaces.