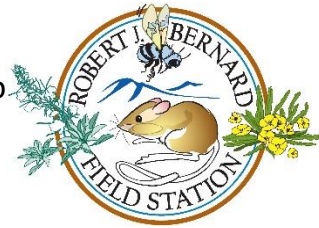


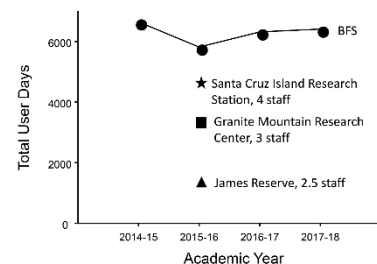
# Robert J. Bernard Field Station's 2018 Report: Regional Leadership in Environmental Research and Education

**Summary:** This brief report summarizes the Robert J. Bernard Field Station's (BFS) use and accomplishments over multiple years to highlight the critical role the BFS plays at the Claremont Colleges, and throughout the region. The BFS's mission is to increase understanding and awareness of southern California's terrestrial ecosystems through research, education, and outreach. We seek to continue to provide opportunities for a diverse community of scholars and build the College's legacy as a regional leader in environmental education and research.



**BFS Use:** The BFS is one of the most heavily used field stations in southern California. Two metrics are used to calculate BFS use:

**1. User Days.** On average the BFS documents ~ 6,000 user days each year (Figures 1, 2). This conservative estimate does not include use associated with our active volunteer program, the director's use, or other community outreach events. User day statistics also underestimate actual use: people must sign in to be counted and omissions are common.

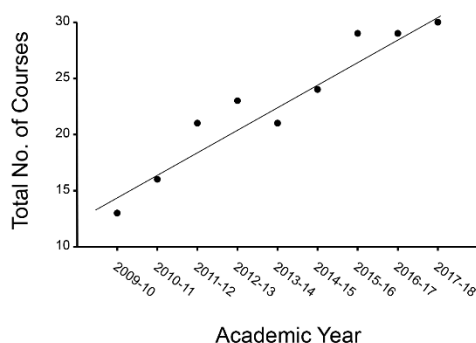


**Figure 1.** Documented user days at the BFS and from 3 well known field stations in southern California. Data from other field stations comes from the Santa Rosa Island 2016-17 Annual Report.

User days is a metric used by most field stations allowing us to compare our use to use at peer southern California field stations. The BFS records more user days, and has less staff than other well-known field stations in the region (Figure 1).



**Figure 2. Example activities at Bernard Field Station.** Far left: Maddi Cowen holding a western scrub jay. Middle Left: Vian Zada measuring base of burned shrub that failed to resprout and Jeffrey Allen taking GPS data. Middle: Ecology for Non-Majors students Sara Acevedo, Laila Ruffin, Coleman Solis, and Abdullhah Shahid doing a plant survey at the BFS for their community ecology independent project. Middle Right: Local Elementary student surveying arthropods (e.g., insect, millipede, spider) diversity at the BFS. Far Right: Nicolle Iacobacci and Lillian Horin are putting colored foam petals around artificial flowers to test what cues hummingbirds use to remember the location of a food reward.



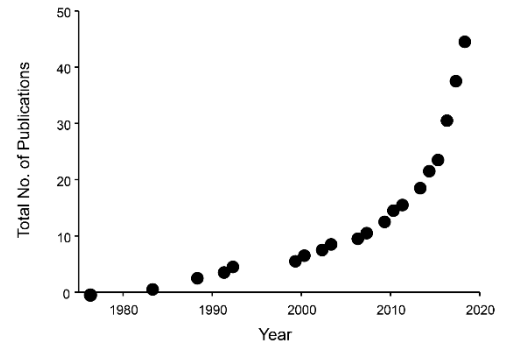
**Figure 3.** Total number of courses from the Claremont Colleges that used the BFS each academic year.

**2. Number of Courses.** The number of courses annually using the BFS has increased over the past decade (Figure 3). This again is a conservative estimate as courses from other institutions (e.g., Cal Poly Pomona, Cal State Fullerton, Pasadena City College Webb Schools, and Sycamore Elementary) were not included. In addition, the BFS hosts activities for many Claremont College programs (e.g., Scripps College Academy, Pomona's POSSE program, and Keck Summer Science Immersion Program). Hands-on learning at the BFS provides authentic learning experiences that cannot be replicated in a classroom.

**Research at the BFS:** Research from the BFS is increasingly contributing to a better understanding of how to conserve both biodiversity and ecosystem function in our region (Figures 4, 5). The BFS averages ~ six to seven senior thesis each academic year. Excellent mentorship by faculty on senior thesis projects is leading to peer-reviewed scientific publications (Figure 4).



**Figure 4. Student research at Bernard Field Station.** Left: Madison Dipman with Peter Pellittier and Weston Staubus setting out a litter decomposition experiment. The manuscript is currently being reviewed by the journal *Soil Biology and Biochemistry*. Middle: Megan Wheeler conducting research on carbon storage published in *Journal of Arid Ecosystems*. Right: Tessa Adams conducting research on ant responses to fire published in *Southwestern Entomologist*.



**Figure 5.** Total number of peer-reviewed publications since the beginning of the BFS (1976). The number of publications has doubled in the last 6 years.

**BFS Outreach:** BFS outreach efforts are primarily grouped into four main programs: (1) annual BFS Earth Day Events, (2) the BFS volunteer program, (3) The Leadership in Environmental Education Partnership (LEEP), run through Pitzer College, and (4) BFS Director efforts to expand bio-monitoring efforts and undergraduate research opportunities across the region.



**Figure 6. BFS Earth Day Activities:** Left: Professor Cathy McFadden leading a bird tour of the BFS. Right: Cal. State Fullerton Professor, Paul Stapp showing families native vertebrate species found at the BFS.

**1. BFS Earth Day Events.** Each April since 2014, the BFS has hosted its annual BFS Earth Day Events. The goal is to engage the greater Claremont Community in the work conducted at the BFS and introduce them to native ecosystems and species that also call Claremont home. On average, 100 people take part in the various tours and activities hosted by faculty and researchers (Figure 6).

**2. Volunteer Program.** The BFS's extremely successful volunteer program continues to engage students and community members from across the region (Figure 7). Over the past decade, we have attracted 100s of volunteers from the 5Cs, other regional colleges, local K-12 schools, and community members from Fontana to Covina.



**Figure 7. Example of BFS Earth Day Activities:** Left: Students from the Conservation Ecology & Management class helping to remove invasive plants. Middle: Citrus College student Emil Sunaj declares victory over his pile of horehound. Right: Community member Lucy Nagler cuts cattails in pHake Lake.



**Figure 8. K-12 activities at Bernard Field Station.** Left: Brenna Gormally assisting Sycamore Elementary students with a survey of plant diversity and leaf structure. Right: College student instructors, K-12 students, and family members visiting the BFS during the LEEP open house

**3. Leadership in Environmental Education Partnership (LEEP).** LEEP, run through Pitzer College since 1996, has provided the primary link between the BFS and local K-12 students (Figure 8). Each year ~150 fifth and sixth grade students come to the BFS each week during the spring semester to learn about southern California ecology. The BFS has been expanding educational opportunities for K-12 students, but has been limited by the availability of the Director.

**4. Director's Efforts.** The BFS Director has been focused on developing and supporting bio-monitoring efforts and enhancing research experiences for undergraduates at the 5Cs (Figure 9). These two components are critical when seeking research funding.



**Figure 9. BFS Director's Efforts:** Top: UC Riverside, Pomona College, Cal Poly Pomona, Chaffey College, and San Bernardino County researchers and land managers participating in a workshop aimed at monitoring biodiversity in the endangered sage scrub ecosystem. Bottom: Regional professors from primarily undergraduate serving institutions at the BFS working to develop a regional undergraduate research network.