

UNIVERSITY OF CALIFORNIA SANTA BARBARA

SEDGWICK RESERVE



ANNUAL REPORT

FY 2009-10

JULY 1 2009 – JUNE 31 2010

PART 1: RESERVE USE DATA

	Home Institution		UC Campus		CSU Campus		Community College		Other CA Campus		Out of State		International		Public Services		TOTALS	
	Users	UDays	Users	UDays	Users	UDays	Users	UDays	Users	UDays	Users	UDays	Users	UDays	Users	UDays	Users	UDays
Research Faculty	8	21	16	48	1	8	2	4			5	21			0	0	32	102
Research Scientist	7	68	11	21	1	3	0	0			2	12			4	11	25	115
Research Assistant	23	60	9	49	0	0	0	0			3	118			0	0	35	227
Research Graduate	29	105	11	27	10	31	0	0			5	9			0	0	55	172
Research Undergraduate	5	10	1	1	1	3	0	0			0	0			0	0	7	14
Subtotal	72	264	48	146	13	45	2	4			15	160			4	11	154	630
University Instructor	14	26	2	4	0	0	0	0			0	0			1	1	17	31
University Student	108	190	13	26	0	0	0	0			0	0			14	14	135	230
Subtotal	122	216	15	30	0	0	0	0			0	0			15	15	152	261
K12 Instructor	17	23	0	0	0	0	0	0			0	0			61	63	78	86
K12 Student	387	393	0	0	0	0	0	0			0	0			562	597	949	990
Government	0	0	0	0	0	0	0	0			0	0			0	0	0	0
Non Profit Organization	7	7	0	0	0	0	0	0			0	0			180	203	187	210
For Profit Business	0	0	0	0	0	0	0	0			0	0			16	28	16	28
Volunteer	1121	1153	2	2	0	0	1	1			0	0			354	354	1478	1510
Other	775	775	31	93	1	3	0	0			1	3			917	1625	1725	2499
Subtotal	2307	2351	33	95	1	3	1	1			1	3			2090	2870	4433	5323
TOTALS	2501	2831	96	271	14	48	3	5			16	163			2109	2896	4739	6214

PART 2: RESERVE USERS' AFFILIATIONS

1. University of California Santa Barbara

University of California Santa Barbara

2. University of California Campus

Cornell University
 UC Berkeley
 UC Davis
 UC Davis
 UC Irvine
 UC Los Angeles
 UC Riverside
 UC Santa Cruz

3. California State University Campus

CSU Long Beach
 CSU Long Beach
 CSU Fullerton

4. California Community College

Butte College

5. Out of State College or University

Oregon State University
 University of Nevada Reno
 University of Washington
 Washington University

6. K-12 Instructor

K-12 Schools Buellton
 K-12 Schools Los Olivos
 K-12 Schools Orcutt
 K-12 Schools Santa Ynez
 K-12 Schools Solvang
 Oak Valley Elementary
 The Santa Ynez Valley Family School

7. K-12 Student

K-12 Schools Ballard
 K-12 Schools Santa Barbara

8. Others

Dunn Middle School
 Sedgwick Reserve

PART 3: USE BY INSTRUCTIONAL GROUPS

Landscape Painting with an Artist and a Naturalist: ART CS 101. UC Santa Barbara, College of Creative Studies. Hank Pitcher

Landscape Painting with an Artist and a Naturalist: ART CS 101. UC Santa Barbara, College of Creative Studies. Hank Pitcher

Conducting Experiments in Ecology: BIO CS 101. UC Santa Barbara, Institute for Computational Earth System Science.
Claudia Tyler

Landscape Ecology: ESM 215. UC Santa Barbara, Bren School of Environmental Science and Management. Frank W Davis

Watershed Analysis: ESM 235. UC Santa Barbara, Bren School of Environmental Science and Management. Tom Dunne

Physiological Plant Ecology: EEMB 141/241. UC Santa Barbara, Ecology, Evolution and Marine Biology. Nicole Molinari

Intro to Astrophysical Measurement: Physics 134. UC Santa Barbara, Physics. Timothy M Brown

Soil Science: SSC 105/205. UC Davis, Land, Air and Water Resources. Randy A Dahlgren

Psyche in Nature: DPP 732. Pacifica Graduate Institute. Elizabeth A Perluss

PART 4: CURRENT RESEARCH

University of California Santa Barbara (19)

Index #: 20869 Sedgwick Observatory

PI: John J Martinez Las Cumbres Observatory (Management/Engineering)

Full Project Title: Commissioning, operation, and maintenance of the Sedgwick Observatory and telescope.

Project Duration: 10/2009 to 10/2020

Funding: PROJECT SELF-FUNDED

Status: ON-GOING

Index # 9822 NUTNET

PI: Carla D'Antonio University of California Santa Barbara (EEMB)

Full Project Title: Nutrient Network: A Cross-Site Investigation of Bottom-Up Control Over Herbaceous Plant Community Dynamics And Ecosystem Function.

Project Duration: 4/2007 to 6/2017

Funding: PROJECT SELF-FUNDED

Status: ON-GOING

Index # 1784 Environmental stress in oaks

PI: Claudia Tyler UC Santa Barbara (Institute for Computational Earth System Science)

Full Project Title: The role of water stress (drought) in oak seedling and sapling survival and performance at Sedgwick Reserve

Project Duration: 7/2003 to 6/2009

Funding: PROJECT SELF-FUNDED

Status: COMPLETED IN FY 2009-2010

Index # 5764 Microbial studies

PI: Patricia A Holden UC Santa Barbara (Donald Bren School of Environmental Science & Management)

Full Project Title: Resource and Stress Interactions in Regulating Microbial Communities in a California Grassland Soil

Project Duration: 7/05 to 10/09

Funding: PROJECT SUPPORTED BY NSF GRANT 0444712

Status: COMPLETED IN FY 2009-2010

Index # 7679 plant-fungi symbioses

PI: Sophie S Parker UC Santa Barbara (Environmental Studies Program)

Full Project Title: The role of plant-fungi symbioses in furthering California grassland invasion

Project Duration: 9/15/06 to 9/15/08

Funding: PROJECT SELF-FUNDED

Status: COMPLETED IN FY 2009-2010

Index # 8230 Summer Biogeochemistry of Grassland Soils

PI: Josh Schimel UC Santa Barbara (Department of Ecology, Evolution, and Marine Biology)

Full Project Title: Summer Biogeochemistry of Grassland Soils

Project Duration: April 2007 to Aug 2010

Funding: PROJECT SUPPORTED NSF GRANT

Status: COMPLETED IN FY 2009-2010

Index # 8830 Sedgwick CCLI Micromet Tower

PI: Dar A Roberts UC Santa Barbara (Geography)

Full Project Title: Sedgwick CCLI Micromet Tower

Project Duration: 9/ 2007 to 9/2015

Funding: PROJECT SELF-FUNDED

Status: ON-GOING

Index # 9731 Role of oaks in California grasslands

PI: Karen A Stahlheber UC Santa Barbara (Ecology, Evolution and Marine Biology)

Full Project Title: Natural heterogeneity and the structure of invaded communities: the role of oaks in California grasslands

Project Duration: April 2007 – June 2014

Funding: PROJECT SELF-FUNDED

Status: ON-GOING

Index# 9964 Native plant persistence on serpentine outcrops

PI: Jonathan M Levine UC Santa Barbara (Ecology, Evolution, and Marine Biology)

Full Project Title: Native plant persistence on serpentine outcrops

Project Duration: 04/23/2008 to 11/01/2010

Funding: PROJECT SUPPORTED BY PACKARD FOUNDATION GRANT

Status: REPLACED BY BEN GILBERT (#19642) STARTING FY 2010-2011

Index # 10409 LiDAR

PI: Burch Fisher UC Santa Barbara (Earth Science)

Full Project Title: Channel Initiation Thresholds through Ultra High-Resolution Topography.

Project Duration: 10/2008 to 8/2009

Funding: PROJECT SELF-FUNDED

Status: ON-GOING

Index # 10560 Resistance of native and non-native vegetation

PI: Nicole Molinari UC Santa Barbara Ecology, Evolution and Marine Biology)

Full Project Title: Resistance of native and non-native vegetation under global change scenarios

Project Duration: April 1 2009 to June 30 2009

Funding: PROJECT SUPPORTED BY A MATHIAS GRANT(S)

Status: ON-GOING

Index #19642 University of California Santa Barbara

PI: Benjamin Gilbert UC Santa Barbara (Ecology, Evolution and Marine Biology)

Full Project Title: Exotic plants and extinction debts

Project Duration: April 2008 to June 2009

Funding: UNKNOWN

Status: ON-GOING

Index # 20805 The effect of resource heterogeneity on native forb success
PI: Nicole Molinari UC Santa Barbara (Ecology, Evolution and Marine Biology)
Full Project Title: investigation into the role of resource heterogeneity on native forb success.
Project Duration: 10/2009 to 7/2011
Funding: PROJECT SUPPORTED BY MATHIAS GRANT #3036
Status: ON-GOING

Index # 20849 University of California Santa Barbara
PI: David Viola UC Santa Barbara (Ecology, Evolution & Marine Biology)
Full Project Title: Local adaptation of serpentine annual plants
Project Duration: Nov 2009 to Nov 2010
Funding: PROJECT SELF-FUNDED
Status: ON-GOING

Index # 21074 Testing environmental tolerances of Avena grasses
PI: Benjamin Gilbert UC Santa Barbara (Ecology, evolution and marine biology)
Full Project Title: Testing environmental tolerances and competitive dynamics of Avena fatua and Avena barbata
Project Duration: Jan 2010 to June 2010
Funding: PROJECT SELF-FUNDED
Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Index # 21080 University of California Santa Barbara
PI: Christian H Balzer UC Santa Barbara (Ecology, Evolution and Marine Biology)
Full Project Title: Does relative nonlinearity in plant growth response to nitrogen and water availability affect community structure in California grasslands?
Project Duration: 01/16/2010 to 9/30/2011
Funding: PROJECT SUPPORTED BY A HENRY LUCE FOUNDATION GRANT
Status: ON-GOING

Index # 21443 AVIRIS
PI: Shishi Liu University of California Santa Barbara (Geography)
Full Project Title: Evaluating Soil-Water-Relations of Different Ecosystems in Southern California Using Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) Data
Project Duration: July 2008 to June 2011
Funding: PROJECT SUPPORTED BY A KEARNEY FOUNDATION OF SOIL SCIENCE GRANT
Status: ON-GOING

Index # 21756 Evolutionary tradeoff between serpentine tolerance and competitive ability
PI: David Viola UC Santa Barbara (Ecology, Evolution & Marine Biology)
Full Project Title: Evolutionary tradeoff between serpentine tolerance and competitive ability
Project Duration: April 2010 to Aug 2011
Funding: UNKNOWN
Status: ON-GOING

Index # 21853 Seed collection
PI: Jonathan M Levine UC Santa Barbara (Ecology, Evolution, and Marine Biology)
Full Project Title: Seed collection for new study taking place within existing plot among the serpentine hummocks.
Project Duration: May 2010 to Aug 2010
Funding: PROJECT SUPPORTED BY FULBRIGHT FELLOWSHIP TO AWARDED TO OSCAR GODOY
Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Other University of California (16)

Index # 1702 Acorn survey
PI: Walter D Koenig UC Berkeley (Museum of Vertebrate Zoology)
Full Project Title: California acorn survey
Project Duration: 9/1980 to 9/2020
Funding: PROJECT SELF-FUNDED Status: ON-GOING

Index # 20036 Microbial Biogeography

PI: Erin E Nuccio UC Berkeley (Plant and Microbial Biology)

Full Project Title: Soil Microbial Biogeography in California Grasslands

Project Duration: May 2009 to June 2010

Funding: PROJECT SUPPORTED BY KEARNEY FOUNDATION OF SOIL SCIENCE GRANT # 2008.041

Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Index # 20558 Grindelia studies

PI: Abigail J Moore UC Berkeley (Integrative Biology)

Full Project Title: Phylogenetic and Population Genetic Studies in the Genus Grindelia (Astereae: Asteraceae)

Project Duration: Sept 2009 to Oct 2009

Funding: PROJECT SUPPORTED BY A LAWRENCE R. HECKARD ENDOWMENT FUND OF THE JEPSON HERBARIUM GRANT

Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Index # 21551 CO2 pulses in Mediterranean annual grasslands

PI: Catherine A Osborne UC Berkeley (Environmental Science, Policy & Management)

Full Project Title: The combined drought strategies of soil microbial communities shape wet-up CO2 pulses in Mediterranean annual grasslands

Project Duration: April 2010 to Sept 2010

Funding: PROJECT SUPPORTED BY KEARNEY FOUNDATION OF SOIL SCIENCE GRANT#2009.017

Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Index # 9919 Oak variation

PI: Brooke S Baythavong UC Davis (Evolution and Ecology)

Full Project Title: Understanding the role of plasticity and genetic variation in parallel invasion fronts: Study of the range expansion of *Erodium cicutarium* in Chile and California.

Project Duration: 4/2008 to 1/2012

Funding: PROJECT SUPPORTED BY NATIONAL SCIENCE FOUNDATION GRANT # 0710412

Status: ON-GOING

Index # 19441 Serpentine Botany Survey

PI: Jane Van Susteren UC Davis (Environmental Science and Policy)

Full Project Title: Statewide Serpentine Botany Survey

Project Duration: 3/2009 to 9/2009

Funding: PROJECT SUPPORTED BY AN UNSPECIFIED GRANT SOURCE

Status: COMPLETED IN FY 2009-2010

Index # 21366 Grazing study

PI: Hugh D Safford UC Davis (Department of Environmental Science & Policy)

Full Project Title: A study of the interacting effects of grazing and productivity on California annual grassland composition and biodiversity

Project Duration: 3/2010 to 8/2010

Funding: PROJECT SUPPORTED BY USDA Forest Service GRANT 10-CR-11052007-XXX

Status: ANTICIPATE COMPLETION IN FY2010 – 2011

Index # 21600 NRS Photography

PI: Christopher R Woodcock UC Davis (Studio Art)

Full Project Title: A Visual Survey; photographic study of the University of California Natural Reserve System

Project Duration: Jan 2010 to June 2010

Funding: PROJECT SUPPORTED BY A MILDRED MATHIAS GRANT

Status: COMPLETED IN FY 2009-2010

Index # 21188 Fungal Biogeography in Southern California

PI: Stephanie N Kivlin UC Irvine (Ecology and Evolutionary Biology)

Full Project Title: How well can fungi migrate under a changing climate?

Project Duration: Jan 2010 to Jan 2012

Funding: PROJECT SUPPORTED BY A MILDRED MATHIAS GRANT Status: ON-GOING

Index # 7859 Lichen studies

PI: Silke Werth UC Los Angeles (Ecology and Evolutionary Biology)

Full Project Title: Comparative phylogeography of *Ramalina menziesii* and its host plants (*Quercus* spp.) in western North America

Project Duration: 01/2007 to 01/2008

Funding: PROJECT SUPPORTED BY A NATIONAL GEOGRAPHIC SOCIETY GRANT
COMPLETED IN FY 2009-2010

Index # 8796 Seed dispersal of oaks

PI: Victoria Sork UC Los Angeles (Ecology and Evolutionary Biology)

Full Project Title: Seed dispersal of oaks

Project Duration: July 2006 to June 2010

Funding: PROJECT SUPPORTED BY NATIONAL SCIENCE FOUNDATION GRANT
Status: ON-GOING

Index # 19460 Oak phenology

PI: Andy Lentz UC Los Angeles (Ecology and Evolutionary Biology)

Full Project Title: Phenology of *Quercus lobata* on the Sedgwick Reserve Figueroa Watershed.

Project Duration: Jan 2009 to June 2015

Funding: PROJECT SELF-FUNDED
Status: ON-GOING

Index # 20398 Population genetics of the Pacific tree frog

PI: Katherine M Pease UC Los Angeles (Ecology and Evolutionary Biology)

Full Project Title: Evolution of Anti-predator Defenses in Larvae of a Native Frog in Response to an Invasive Predator

Project Duration: Aug 2009 to Aug 2010

Funding: PROJECT IS FUNDED BY AN UNSPECIFIED GRANT SOURCE
Status: COMPLETED IN FY 2009-2010

Index # 21940 ecosystem stability and change

PI: Christopher Wills UC San Diego (Division of Biological Sciences)

Full Project Title: Investigation and photography of ecosystem stability and change

Project Duration: June 2010 to June 2010

Funding: PROJECT IS SELF-FUNDED
Status: COMPLETED IN FY 2009-2010

Index # 1910 plant/insect interactions

PI: John N Thompson UC Santa Cruz (Department of Ecology and Evolutionary Biology)

Full Project Title: Geographic mosaics in diversifying plant/insect interactions

Project Duration: 3/04 to 3/07

Funding: PROJECT SUPPORTED BY NATIONAL SCIENCE FOUNDATION GRANT
Status: ON-GOING

Index # 21528 California goldfield survey

PI: Jenn M Yost University of California Santa Cruz (Ecology and Evolutionary Biology)

Full Project Title: Ecological adaptations and the evolution of reproductive barriers in the *Lasthenia californica* complex

Project Duration: March 2010 to June 2010

Funding: PROJECT SUPPORTED BY MILDRED E MATHIAS GRADUATE GRANT 7-443658-54357
Status: COMPLETED IN FY 2009-2010

California State University (2)

Index # 4100 Vegetation comparison of Mediterranean California

PI: Youssef C. Atallah CSU Fullerton (Biology)

Full Project Title: A vegetation comparison of Mediterranean California and Lebanon

Project Duration: September 2002 to April 2005

Funding: PROJECT SELF-FUNDED
Status: ON-GOING

Index # 20106 Little Pine Fault mapping

PI: Nate Onderdonk Long Beach State University (Department of Geological Sciences)

Full Project Title: An investigation of kinematic indicators along the Little Pine Fault and the depositional history of the Paso Robles Formation to determine the tectonic history of the Little Pine Fault system.

Project Duration: June 2009 to Aug 2010

Funding: PROJECT SUPPORTED BY A AMERICAN CHEMICAL SOCIETY GRANT

Status: ON-GOING

California Community College (1)

Index # 8515 facultative cleistogamy in *Camissonia* spp.

PI: Michael P Williams Butte College

Full Project Title: The ecological role of facultative cleistogamy in a serpentine annual plant

Project Duration: 3/2007 to 12/2009

Funding: PROJECT SELF-FUNDED

Status: COMPLETED IN FY 2009-2010

Out of State University (5)

Index # 7195 Grassland composition

PI: Angela J Brandt Oregon State University (Zoology)

Full Project Title: Change in California grassland community composition over temporal and spatial scales and under different nutrient conditions

Project Duration: 9/2006 to 6/2009

Funding: PROJECT IS SELF-FUNDED

Status: COMPLETED IN FY 2009-2010

Index # 19705 Pollen collection

PI: Kyle Funk Cornell University

Full Project Title: reproductive ecology of *Quercus lobata*

Project Duration: 2/2009 to 6/2014

Funding: PROJECT IS FUNDED BY AN UNSPECIFIED GRANT SOURCE

Status: ON-GOING

Index # 20829 wood rat genetics

PI: Marjorie Matocq University of Nevada Reno (Natural Resources and Environmental Science)

Full Project Title: Hybridization between *Neotoma macrotis* and *Neotoma fuscipes*.

Project Duration: Nov 2009 to Jan 2010

Funding: PROJECT SUPPORTED BY NATIONAL SCIENCE FOUNDATION GRANT # DEB-0952946

Status: COMPLETED IN FY 2009-2010

Index # 5611 Serpentine studies

PI: Janneke Hillerislambers University of Washington Seattle (Biology)

Full Project Title: The role of stabilizing and equalizing processes in maintaining the diversity of California annual serpentine communities

Project Duration: 2005 to 2015

Funding: PROJECT SUPPORTED BY NSF AND PACKARD FOUNDATION GRANTS

Status: ON-GOING

Index # 4123 native consumers

PI: John Orrock Washington University (Biology)

Full Project Title: The role of native consumers in the interactions between native and exotic plant species

Project Duration: 6/ 2004 to 6/2012

Funding: PROJECT SUPPORTED BY AN UNSPECIFIED GRANT SOURCE

Status: ON-GOING

Government (1)

Index # 10211 Lepidoptera survey

PI: Chris Grinter California Academy of Sciences (Entomology)

Full Project Title: Survey of California Lepidoptera with special attention to the microlepidoptera.

Project Duration: 8/2008 to 12/2012

Funding: PROJECT IS SELF-FUNDED

Status: ON-GOING

		UCSB	OTHER UC	CAL STATE	OUT OF STATE	COMMUNITY COLLEGE	GOV'T	TOTALS
STATUS	New	1	6	0	0	0	0	7
	On-going	14	5	2	3	0	1	25
	Completed	4	5	0	2	1	0	12
	Total	19	16	2	5	1	1	44
FUNDS	Grant funded	8	11	1	2	0	0	22
	Self funded	9	3	1	1	1	1	16
	Unspecified	2	2	0	2	0	0	6
USER DAYS		264	146	45	160	4	11	630
REVENUE FROM FACILITY USE		(7) \$244	(7) \$337	(5) \$174	(5) \$662	0	(1) \$6	(25) \$1423

PART 5: PUBLICATIONS

Bakker, E.G., B. Montgomery, T. Nguyen, K. Eide, J. Chang, T.C. Mockler, A. Liston, E.W. Seabloom and E.T. Borer. 2009. Strong population structure characterizes weediness gene evolution in the invasive grass species *Brachypodium distachyon*. *Molecular Ecology* 18:2588-2601.

Brandt, A.J., E.W. Seabloom and P.R.Hosseini. 2009. Phylogeny and provenance affect plant-soil feedbacks in invaded California grasslands. *Ecology* 90:1063-1072.

Brandt, A.J. and E.W. Seabloom. In Press. Regional and decadal patterns of native and exotic plant coexistence in California grasslands. *Ecological Applications*.

Chadwick, O.A. and D.A. Roberts. 2010. Modeling Soil Moisture in California at Multiple Scales. *American Naturalist* 175.

Craine, J. M., N. Fierer, and K. K. McLauchlan. in press. Widespread coupling between the rate and temperature sensitivity of organic matter decay. *Nature Geoscience*. 3:854-857.

D'Antonio, C.M. and K.A. Stahlheber. 2009. Islands of invasion: dominance of exotic species beneath oak canopies in CA grasslands. CNPS 2009 conservation conference: strategies and solutions.

Everard, K., Seabloom, E., Harpole, S. & C.D. Mazancourt. 2010. Plant water use affects competition for nitrogen: Why drought favors invasive species in California. *The American Naturalist* 75: 85-97.

HillerisLambers, J. and J.M. Levine. 2009. The importance of niches for the maintenance of diversity. *Nature* 461: 254-257.

HillerisLambers, J., Going, B.M. and J.M. Levine. 2009. Abiotic and biotic resistance to grass invasion in serpentine annual plant communities. *Oecologia* 159(4): 839-847.

Holden, P., Schimel, J.P. and D.D. Roux-Michollet. 2010. Pushing the limits for amplifying BrdU-labeled DNA encoding 16S rRNA: DNA polymerase as the determining factor. *Journal of Microbiological Methods* 83(3): 312-316.

- Holden, P.A., Schimel, J.P., Wetterstedt, J.A. Martin and S.E. Trumbore. 2010. Drying/rewetting cycles mobilize old C from deep soils from a California annual grassland. SLU University Library reprint.
- Koenig, W. D., J. M. H. Knops, J. L. Dickinson, and B. Zuckerberg. 2009. Latitudinal decrease in acorn size in bur oak (*Quercus macrocarpa*) is due to environmental constraints, not avian dispersal. *Botany* 87: 349-356.
- Nuccio, E.E. and M.K. Firestone. 2009. Soil Microbial Biogeography in California Grasslands: Scaling from Millimeters to Kilometers. Kearney Foundation of Soil Science: Understanding and Managing Soil-Ecosystem Functions Across Spatial and Temporal Scales Progress Report: 2008041.
- Orrock, J. L. and J. L. Hoisington-López. 2009. Mortality of exotic and native seeds in invaded and uninvaded habitats. *Acta Oecologica* 35: 758-762
- Parker, S.S. and J.P. Schimel. 2010. Invasive Grasses Increase Nitrogen Availability in California Grassland Soils. *Invasive Plant Science and Management* 3(1):40-47.
- Parker, S.S. and J.P. Schimel. 2010. *Nassella pulchra* and spatial patterns in soil resources in native California grassland. *Grasslands* 10:11–15.
- Sage, R. D., W. D. Koenig, and B. C. McLaughlin. 2011. Fitness consequences of seed size in the valley oak *Quercus lobata* Née (Fagaceae). *Annals of Forest Science*.
- Schimel, J. P., Treseder, K. K., Garcia, M. O. and Whiteside, M. D. 2010. Slow turnover and production of fungal hyphae during a California dry season. *Soil Biology and Biochemistry* 42 (9): 1657-1660.
- Schimel, J. P., Boot, C., Holden, P., Roux-Michollet, D., Parker, S., Schaeffer, S. and Treseder, K. 2010. The Biogeochemistry of Drought.
- Seabloom, E. W. In Press. Spatial and Temporal Variability in Propagule limitation of California Native Grasses. *Oikos*.
- Seabloom, E. W., E. T. Borer, C. E. Mitchell, and A. G. Power. 2010. Viral diversity and prevalence gradients in North American Pacific Coast grasslands. *Ecology* 91:721-732.
- Seabloom, E. W., E. T. Borer, A. Jolles, and C. E. Mitchell. 2009. Direct and indirect effects of viral pathogens and the environment on invasive grass fecundity in Pacific Coast grasslands. *Journal of Ecology* 97:1264-1273.
- Seabloom, E.W., P. R. Hosseini, A. G. Power, and E.T. Borer. 2009. Causes and implications of co-infection by RNA viruses in natural grasslands. *The American Naturalist*. 173:E79-E98.
- Seabloom, E.W., Hosseini, P.R., Power, A.G., and E.T. Borer. 2009. Diversity and Composition of Viral Communities: Coinfection of Barley and Cereal Yellow Dwarf Viruses in California Grasslands. *American Naturalist* 173(3).
- Seabloom, E.W., Harpole, W.S. and K. Everard. 2009. Plant Water Use Affects Competition for Nitrogen: Why Drought Favors Invasive Species in California. *Nature* 461:254-257.
- Sork, V. L., Pluess, A. R., Dolan, B., Davis, F. W., Grivet, D., Merg, K., Papp, J. and P.E. Smouse. 2009. Short distance pollen movement in a wind-pollinated tree, *Quercus lobata* (Fagaceae). *Forest Ecology and Management* 258 (5): 735-744.
- Sork, V.L., Scofield, D.G. and P.E. Smouse. 2010. Influence of acorn woodpecker social behaviour on transport of coast live oak (*Quercus agrifolia*) acorns in a southern California oak savanna. *Journal of Ecology*, Vol. 98(3):561-572.

Thompson, J.N., Laine, A.L. and J.F. Thompson. 2010. Retention of mutualism in a geographically diverging interaction. *Ecology Letters* 13: 1368-1377.

Tyler, C.M., Mahall B.E., E.S. Cole and C. Mata. 2009. A comparative study of oak seedling physiology during summer drought in southern California. *American Journal of Botany* 94(4):1-13.

PART 6: NARRATIVE

RESEARCH

Forty-four (44) research projects were handled by Reserve staff during the fiscal year. Seven projects were new, 25 projects were on-going and 12 were completed by the end of the reporting period. An additional 5 projects (listed below) posted no activities during the fiscal year although they remain on the Sedgwick research roster.

In 2009 – 2010, researchers spent 630 days working on 44 projects for an average of 14 days per project with a range of 1-106 days of use. As in previous years, the majority of research conducted at Sedgwick was done during day-only visits. UCSB researchers had both the most projects (19) and the most user days (264). Other UC researchers were the second most frequent users with 16 projects and 146 user days. The remaining projects were completed by out of state universities (5), Cal State Universities (2) California community colleges (1) and 1 from a governmental agency (California Academy of Science).

Of those applications that reported grant support information (38 of 44) half of the projects received some level of grant funding (22) and 16 reported being self funded (36%).

No proposed research projects were canceled or rejected in FY09-10.

16 of 44 researchers (36%) stayed overnight at Sedgwick for at least 1 night. Researchers stayed an average of 6 nights per project with the longest stay being 26 nights and the most common length of stay being 3 nights. Housing-dependent research represented 23% of Sedgwick's research use. This use came from 10 research projects based at Sedgwick for a total of 70 nights that enabled 210 days of field work. During the reporting period a total of \$1423 in facility and vehicle use charges were billed to 25 researchers. Although additional housing in the ranch house became available in the 4th quarter of the reporting period, facility use has yet to increase significantly over past years.

User days that involved remote data collection (sensors, traps or remote operated equipment such as the telescope or weather stations) were not included in use calculations except when a researcher visited the site to set up, take down or work on the equipment. If included Sedgwick's use figures for research would be substantially higher. For example research and on-going use of the telescope by LCOGT (10 research science user days/24 research assistants user days and 1500 other user days) was an estimate provided by LCOGT after repeated requests (use of the Las Cumbres Observatory for public and private events have been recorded under PUBLIC SERVICE, and one class was scheduled for UNIVERSITY LEVEL INSTRUCTION).

New projects initiated in the fiscal year (12) included: *Local adaptation of serpentine annual plants* (David Viola, UCSB); *An investigation of kinematic indicators along the Little Pine Fault - tectonic history of the Little Pine Fault system* (Nate Onderdonk, Cal State Long Beach); *Phylogenetic and Population Genetic Studies in the Genus Grindelia* (Abigail Moore, UC Berkeley); *Astronomical research into extrasolar planets, supernovae, and other time-domain astrophysical research* (Las Cumbres Observatory John Martinez); *Evaluating Soil-Water-Vegetation Relations of Different Ecosystems in Southern California Using Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) Data* (ShiShi Liu, UCSB); *How well can fungi migrate under a changing climate?* (Stephanie Kivlin, UC Irvine); *The combined drought strategies of soil microbial communities shape wet-up CO₂ pulses in Mediterranean annual grasslands* (Catherine Osborne UC Berkeley); *A study of the interacting effects of grazing and productivity on California annual grassland composition and biodiversity* (Hugh D Safford, UC Davis); *Evolutionary tradeoff between serpentine tolerance and competitive ability* David Viola, UCSB); *10. The effect of resource heterogeneity on native forb success* (Nicole Molinari, UCSB); *Effects of fluctuations in nitrogen and water*

availability on grassland community structure (Christian Balzer, UCSB). Seed collection for new study taking place within existing plot among the serpentine hummocks (Jonathan M Levine , UC Santa Barbara)

Projects started and completed in the fiscal year (7) include: *Hybridization of wood rats* (Marjorie Matocq, University Nevada at Reno); *Evolution of Anti-predator Defenses in Larvae of a Native Frog in Response to an Invasive Predator* (Katherine Pease UCLA); *A Visual Survey; photographic study of the University of California Natural Reserve System* (Christopher R Woodcock, UC Davis); *Statewide Serpentine Botany Survey Jane Van Susteren* (UC Davis) ; *Investigation and photography of ecosystem stability and change* (Christopher Wills UC San Diego); *Ecological adaptations and the evolution of reproductive barriers in the *Lasthenia californica* complex* (Jenn Yost, UC Santa Cruz); *Soil Microbial Biogeography in California Grasslands* (Erin E Nuccio, UC Berkeley) .

Multi-year projects completed in the fiscal year (7) included: *Environmental stress in oaks* (Claudia Tyler UC Santa Barbara); *Resource and Stress Interactions in Regulating Microbial Communities in a California Grassland Soil* (Patricia A Holden, UC Santa Barbara); *plant-fungi symbioses* (Sophie S Parker, UCSB); *Summer Biogeochemistry of Grassland Soils* (Josh Schimel, UCSB) ; *Comparative phylogeography of *Ramalina menziesii* and its host plants (*Quercus spp.*) in western North America* (Silke Werth UC Los Angeles); *The ecological role of facultative cleistogamy in a serpentine annual plant* (Michael Williams Butte College); *Change in California grassland community composition over temporal and spatial scales and under different nutrient conditions* (Angela J Brandt Oregon State University).

On-going projects (18) include: *Lepidoptera survey* (Chris Grinter, California Academy of Sciences); *2. Native consumers* (John Orrock Washington University); *Serpentine studies* (Janneke Hillerislambers, University of Washington Seattle); *Oak pollen collection* (Kyle Funk, Cornell University); *Vegetation comparison of Mediterranean California* (Youssef C. Atallah CSU Fullerton); *plant/insect interactions* (John N Thompson UC Santa Cruz); *Oak phenology* (Andy Lentz UC Los Angeles); *Seed dispersal of oaks* (Victoria Sork, UC Los Angeles); *Oak variation* (Brooke S Baythavong , UC Davis); *California acorn survey* (Walter D Koenig UC Berkeley); *Testing environmental tolerances of Avena grasses* (Benjamin Gilbert, UC Santa Barbara); *Exotic plants and extinction debts* (Benjamin Gilbert UC Santa Barbara); *Resistance of native and non-native vegetation* (Nicole Molinari , UC Santa Barbara); *LiDAR* (Burch Fisher UC Santa Barbara); *Native plant persistence on serpentine outcrops* (Jonathan M Levine, UC Santa Barbara); *Role of oaks in California grasslands* (Karen A Stahlheber UC Santa Barbara); *Sedgwick CCLI Micromet Tower* (Dar Roberts UC Santa Barbara); *NUTNET* (Carla D'Antonio University of California Santa Barbara).

Inactive projects with research equipment left in place (5): *The role of seed limitation, resource competition, and community complementarity in invasions and restoration* (Eric Seabloom, Oregon State University, Date of last activity/visit: May 2009); *Effects of chronic nitrogen deposition on grassland communities* (Stan Harpole, Iowa State University Date of last activity/visit: May 2009); *Long term patterns of plant diversity and composition* (Stan Harpole, Iowa State University Date of last activity/visit: May 2009); *Effects of cattle grazing on grasslands* (Claudia Tyler, UCSB Date of last activity/visit: June 2009); *Santa Barbara County Oak Project* (Claudia Tyler, UCSB Date of last activity/visit: June 2009).

Twenty-nine journal manuscripts based on Sedgwick research were published in 2009 and 2010 (same as last year).

UNIVERSITY LEVEL INSTRUCTION

The number and frequency that university level classes utilized the Sedgwick Reserve continued to decline in the 2009-2010 school year.

A total of 8 university classes used the Sedgwick Reserve for 10 instructional visits during the 2009-2010 reporting period (down 33% from the previous year). Fifty-eight percent (6 of the 8) originated from UCSB (1 from the College of Creative Studies' Art Department, 1 from College of Creative Studies' Institute for Computational Earth System Science, 2 from Donald Bren School of Environmental Science and Management, 1 from Ecology, Evolution, and Marine Biology and 1 from the Physics Department). Soil Science: SSC 105/205. Non-UCSB classes included a soils class taught by UC Davis, and a psychology course originating from the Pacifica Graduate Institute.

Two notable multi-day class trips during the year include the “Landscape Painting with an Artist and Naturalist” class taught by UCSB College of Creative Studies professors Hank Pitcher and Bruce Tiffany (featured in the summer 2009 NRS Transcript publication) and a “Landscape Ecology” class taught by UCSB Bren School professor Frank Davis.

PUBLIC OUTREACH

Outreach programs continued to be active on the reserve throughout 2009-2010. In summary, 949 school-aged youth, 78 teachers and over 2300 adults visited the reserve during the year as part of the organized outreach programs detailed below. A total of 88 volunteers donated 1153 user days benefiting the reserve and its programs.

K-12 educational highlights of the year included the continuation of the Sedgwick Outdoor Classroom program. Fifty-eight fourth grade students, fifty-three fifth grade students participated in the science based program designed to augment the CA Science Content Standards classroom curriculum. Sixty-five percent of the fifth grade students had participated in the fourth grade program. They had the opportunity to expand their studies at the reserve by classifying each ecosystem identified on the reserve and experiencing the exceptional Sedgwick night skies by attending a family astronomy night. Continuing the student to docent ratio of 6:1 allowed for extraordinary experiential learning during the full-day field trips. In addition to the 17 “group leader” docents, 12 additional volunteers gave their time to ensure the success of the program.

Other highlights included the launch of the Junior Docent program with five Los Olivos Elementary School G.A.T.E. eighth grade students participating in three intense natural history and leading interpretive hike sessions; and concluding the program by leading the parent-only hike for the Outdoor Classroom program. The Dunn School internship program continued; two 8th grade students completed the 3-day internship working in the native plant nursery and demonstration garden.

K-12 education summer programs included the Chumash Youth Workshop; Oak Valley Elementary School hike and lunch retreat for teachers and administrators; and the return of Los Olivos Elementary School 7th Grade “Team Building in Nature” day trip and family dinner picnic. Rounding out the summer was the Brownie Troop camping trip where eight girls worked on their natural history badge with the assistance of their troop leader and four volunteers.

In addition to the seven Outdoor Classroom field trips, K-12 education efforts throughout the year included hosting 15 one day field trips, structuring field trips to accommodate multiple class and grades, expanding outdoor educational opportunities to multiple grades, coordinating researcher presentations for K-12 students, and recruiting three new schools to the reserve. All schools with the exception of one private school in the Santa Ynez Valley had one or more classes attend a field trip with one school bringing the entire school for a day at the reserve. In November, a local private school continued their tradition of a 4th and 5th grade hike to the reserve and camping at the field station. In addition to their usual activities, they were treated to an astronomy presentation at the new Byrne Observatory and tour of the night sky by LCOGT staff. LaColina Junior High School also camped at the reserve for one night. Their days were filled with hiking, restoration work, group and individual science studies. Jonata School’s 6th grade tradition of hiking from top of the reserve to the Field Station to commemorate the end of the school year continued.

Public access days offered during this fiscal year included eight public hikes led by docents, accounting for 120 user days, and were attended by over 340 members of the public. The highlight of the year was the April 10th Open House in conjunction with the public hike. Over 550 guests attended the event with 120 participating in the public hikes. One equestrian tour was permitted during the year with ten riders and two equestrian docents.

Sedgwick also hosted numerous on-site events included: staff retreats for the UCSB Office of the Registrar and UCSB Student Health Center Planning Team; a private hike for the Wildling Museum’s birding class; SCAPE Paint-outs; a series of private hikes; the YMCA Family Hike; and multiple hikes for the Santa Ynez Valley Women Hikers. All on-site events include docent-led hikes and/or Sedgwick natural history presentations

Off-site events included presenting at and attending Los Olivos School’s teacher in-service lunch; having a booth at the local Los Olivos “Day in the Country” festival; and attending the Eagle Scout Court-of-Honor ceremony for Ryan Andreas, who completed his Eagle Scout project landscaping around the Byrne Observatory at Sedgwick Reserve.

The Sedgwick docent program continued to be quite active on the reserve and was vital to the success of the reserve's outreach programs. Docents took on a multitude of assignments, including running public hikes, assisting with the Outdoor Classroom program, leading K-12 hikes, building owl boxes with students, working in the native plant nursery, restoring the grounds around the Byrne Observatory, maintaining and establishing new trails and participating in bird counts.

To coordinate docent activities, quarterly docent communication meetings continued in 2009-2010, with an average of 23 attendees per meeting. A private tour & reception for docent recruitment was held in October, with a new docent training class beginning in November. On April 23rd, twenty new docents graduated from the 24-week docent training class. Throughout the year, numerous continuing education opportunities were offered to docents (Serpentine Flora, Geology, Ornithology and Chumash Culture).

During non public hike months, docents participated in training hikes learning interpretive hike leading techniques as well as the reserve's natural history. Docents assisted with multiple star-gazing events hosted by LCOGT.

Over the fiscal year, the 1588 volunteer user days proved invaluable to the reserve and the outreach program.

STEWARDSHIP

It was an above average rainfall year for the Reserve, with the seasonal rainfall total of 22 inches being recorded from a rain gauge located on the north-eastern corner of the ranch house. The Reserve received its first precipitation of the season in mid-October 2009, with the season's final rain event occurring May 17-18, 2009. Temperatures dropped below freezing during two January cold spells, bursting pipes at the Tipton Meeting House in December 2009. Weather throughout the year was typical: breezy warm days and cool nights with several week-long heat spells punctuating the summer.

Cattail reeds (*Typhus* spp.) were reported in the Sedgwick pond starting in the late 1990's. Reeds have since begun to encroach on the shallow edges of the pond and now occupy nearly a quarter of the pond's 1 acre surface. In August of 2009 Sedgwick staff and volunteers attempted to reduce the reed coverage at the Sedgwick pond by hand pulling and cutting reeds along the pond's edges and inlet. The hand removal technique was deemed neither a success nor a long-term strategy to maintain open water in the stock pond but did reduce the mass of reeds by an estimated 15%.

The revised Shepherd Organic Farm lease was signed in September 2009, reducing the size of the license from 98 to 30 acres. The terms of the lease and duration (September, 2024 expiration) remain the same. The 2010 growing season was favorable for the Shepherd Farm, the first positive forecast since the lease was enacted in 2005. The 300 fruit trees bore their first harvestable crop.

During the spring quarter of 2010 the new Director's Residence was completed and occupied.

Demolition of the Foreman's House was completed in January by land steward Brian Guerrero. Site restoration continues into the 2010-2011 reporting period.

A \$1M gift designation of the Marvin Clarke estate enabled work on the Tipton House to resume in FY2009-2010 reporting period. In February 2010 a \$738,451 construction contract was awarded to Melchiori Construction under guidance of by UCSB Project Manager Steve Eggemeyer. Work began in April 2010 and continued through the end of the reporting period.

A \$300,000 donation from Linda Duttenhaver allowed for the restoration of the historic hay barn between October 2009 and June 2010. Work was done by EJS Construction.

The main (paved) road received two treatments in 2010. In the last week of the spring quarter, Golden State Paving filled all the cracks in the paved road (an annual \$2500 investment) and applied a coat of road seal to the main road, a \$7800 investment to extend the life of the paved entrance road that needs to be done every 5 years.

A cattle grazing agreement with the neighboring Bar-go Ranch was signed on in December 2009, allowing 150 head of cows to graze designated the Heirs Pasture between December 15, 2009 and May 1, 2010. Cows were not used for grazing research in 2010. Cows from outside the Reserve and Bar-go lease escapees were a common nuisance in 2010. Most of the problems originated from the western boundary fence at the end of Caballo Road in the Woodstock Ranch.

About \$14,000 in donor funds were spent on fence work in 2010. Lonestar Engineering installed new gates at base of Lisque, by studio leading to pond, both ends of the Flum Pasture, split rail fencing around the eastern end of the former Foreman's House, on the front of the new residence, and a small piece at the eastern end of Lisque.

Four new restoration efforts were initiated in the 2009-2010 reporting period: restoration of the BOS Observatory; Tipton Meeting House; Director's Residence and the area around the demolished Foreman's House. New orange and brown signs were installed where restoration efforts are underway.

ADMINISTRATION

The Sedgwick Reserve operated in the 2009-2010 fiscal year with two career staff, full-time (100%) Director Kate McCurdy and part-time (90%) Administrative Assistant Sue Eisaguirre (outreach & education) and a cadre of part-time employees. SCI steward Brian Guerrero (20%) completed critical maintenance tasks. Eric Massey (40%) performed vegetation control and other maintenance assignments Dennis Beebe (40%) worked in Buildings & Grounds. Nancy Stearns (35%) ran the native plant nursery; a new restoration specialist Nick Giese came on board June 10th (20%) to concentrate on the Tipton Meeting House landscaping. Graduate student Karen Stahlheber (15%) continued to assist on occasion with GIS projects. Lorena Villasana, was hired into a 10% custodial position appointment in March 2010. As in previous years, the Sedgwick Reserve received excellent administrative support from Donna Moore, Mat Jordan, Sue Swarbrick and Bill Murdoch in the NRS campus office. Development Officer Gay Larsen also contributed a great deal more than her 20% time position calls for in helping with marketing and donor relations for Sedgwick, starting in September of 2009.

PART 7: NRS CAMPUS COMMITTEE ROSTER

Joshua Schimel	Committee Chair (ex-officio); Ecology, Evolution and Marine Biology
William W. Murdoch	Director (ex-officio); Ecology, Evolution and Marine Biology
Susan Swarbrick	Associate Director (ex-officio); UCSB Natural Reserve System

Sedgwick Reserve

Joshua Schimel	Faculty Advisor (ex-officio); Ecology, Evolution and Marine Biology
Jonathan Levine	Representative; Ecology, Evolution and Marine Biology

Members-at-Large

Chris Costello	Associate Professor; Bren School
Henry Offen	Professor Emeritus; Chemistry (passed away 4/25/2010)
Douglas Bush	Academic Coordinator; Biological Sciences

Community Representatives

Michael Feeney	Land Trust of Santa Barbara County (William Abbot, Alternate)
Mary Meyer	California Department of Fish and Game
Lotus Vermeer	The Nature Conservancy

Student Representatives

TBD	Undergraduate and Grad Representative; Associated Students
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