

RFP Applied Studies	Principal Investigator	Data type	Matrix/species	Sample events/year	Locations	# of Locations
<b>Topic 1 Habitat Evolution</b>						
Measuring Habitat Evolution Utilizing Satellite Imager	Brian Fulfrost, DCE	IKONOS satellite imagery	GIS datasets produced	1 set/year for 3 years	most of south bay south of DB bridge	n/a
		survey forms and photos	ground-truthing documentation	as needed	as needed	as needed
Vegetation Thresholds and Sediment Dynamics in Restored Marshes of South San Francisco Bay	John Callaway, University of San Francisco	vertical accretion rates using pins	sediment	3 mo, 6 mo, 12 mo, 18 mo, 24 mo after breach	Pond A6	10 pins
		mass accretion rates using rubber disks	sediment	collect sediment for 2 weeks every 2 months for 1st year	Pond A6	10
<b>Topic 2 Mercury Bioavailability</b>						
The Effects of Wetland Restoration on Mercury Bioaccumulation in the Sought Bay Salt Pond Restoration Project: Using the Biosentinel Toolbox to Monitor Changes Across Multiple Habitats and Spatial Scales	Collin Eagles-Smith, USGS	Hg analysis	eggs/Forster's tern	15 eggs/colony x 4 colonies for 2 years	TBD	4 colonies
		Hg analysis	eggs/American avocet	15 eggs/colony x 4 colonies for 2 years	TBD	4 colonies
		Hg analysis	Hg in Threespine stickleback (whole body)	10 samples each 3x/year for 2 years	Pond A8, A16, A3N	3 ponds
		Hg analysis	whole body/Threespine stickleback	10 samples each 3x/year for 2 years; first year will have 2 additional sample events before and after breach	Mallard Slough (negative control) and 4 locations in Alviso Slough	5 in sloughs
		Hg analysis	whole body/ Mississippi silverside	3 sites with 6 replicate composites per site, 3x/year for 2 years; first year will have 2 additional sample events before and after breach	Mallard Slough (negative control) and 4 locations in Alviso Slough	5 in sloughs
		Hg analysis	Sediment	9 locations 3x/year for 2 years	same as water locations	9 locations
		Hg analysis	water - dissolved	1 sample 10x/year for 2 years	3 sites on Alviso slough, 3 sites on Pond A8, Mallard Slough, Pond A16, Pond A3N	9 locations
		Hg analysis	water - particulate	1 sample 10x/year for 2 years	3 sites on Alviso slough, 3 sites on Pond A8, Mallard Slough, Pond A16, Pond A3N	9 locations
		Stable isotopes	whole body/ Three spine stickleback	1 sample 10x/year for 2 years	3 sites on Alviso slough, 3 sites on Pond A8, Mallard Slough, Pond A16, Pond A3N	9 locations
		Stable isotopes	whole body/ Mississippi silverside	1 sample 10x/year for 2 years	3 sites on Alviso slough, 3 sites on Pond A8, Mallard Slough, Pond A16, Pond A3N	9 locations
Stable isotopes	whole body/ benthic invertebrates	small number	Mallard Slough (negative control) and 4 locations in Alviso Slough	5 in sloughs		
<b>Topic 3 - Waterbird nesting and foraging in managed ponds</b>						
The Critical Role of Islands for Waterbird Breeding and Foraging Habitat in Managed Ponds of the South Bay Salt Pond Restoration Project	Josh Ackerman, USGS	Island Morphometry	measurement of perimeter, area, elevation, slope, aspect, pond water levels of islands	once	A16, SF2, A12 + 3 more ponds	6 ponds
		Nest monitoring	GPS location of each new nest, mark nest, float egg, record clutch size, nest fate (hatched, failed, depredated)	weekly surveys at 4 islands/pond	A16, SF2, A12 + 3 more ponds	>750 nests
		Nest site selection/vegetation measurements	measure visual obstruction height, % of each plant type within 1m of nest	once, at first visit of nest	A16, SF2, A12 + 3 more ponds	>750 nests
		Waterbird roosting surveys	counts of birds roosting on islands	every 2 weeks October - April	SF2	10-30 islands
		Foraging/roosting surveys	counts of birds by species within pond grid cell (250mx250m)	monthly	various	30-40 ponds
Supplemental Study #1	Nesting Bird Response at SF2 (Study 3 from Trulio original study)	Distance from nest to disturbance feature	GPS using UTM coordinates	each new nest at visit	SF2	10 - 30 nests
		Nest performance (nest survival, clutch size, nest initiation date)	avocets, Forster's terns, stilts	2 days/week for 7 months March - September = 14/year	SF2	1
<b>Topic 4 - Waterbird response to trail use</b>						
Study of Waterbird Response to Trail Use in the South Bay Salt Pond Restoration Project	Lynne Trulio, San Jose State University	Bird abundance - #	shorebirds and waterfowl	1/month August - April = 6/year	TBD	20
		Species richness	shorebirds and waterfowl	1/month August - April = 6/year	TBD	20
		flight response - distance	shorebirds and waterfowl	1/month August - April = 6/year	TBD	20
		bird disturbance behavior	shorebirds and waterfowl	1/month August - April = 6/year	TBD	20
		flight initiation distance	shorebirds and waterfowl	1/month August - April = 6/year	TBD	20
		flight initiation distance	snowy plover	2/month for 4 months = 8/year	TBD	up to 14
		answers to survey questions	humans	2 days/season for 1 year = 8/year	TBD	3 to 5
<b>Topic 5 - Pond, Slough and Bay Water Quality Interactions</b>						
Pre and Post Restoration Assessment of Benthic Communities	Jan Thompson, USGS	species identification	benthic invertebrates	n/a	n/a	n/a
		rate of biomass conversion	benthic invertebrates	n/a	n/a	n/a
		grazing rate	benthic invertebrates	n/a	n/a	n/a
<b>Topic 6 - Baseline Bird Data and Data Needs Assessment</b>						
Integrating Avian Datasets for Management, Modeling and Visualization to Benefit the South Bay Salt Pond Restoration Project	Grant Ballard, Point Reyes Bird Observatory	survey data	database	n/a	n/a	n/a
		historical bird abundance	numbers/various species			
		historical nesting data (nest abundance, species distributions, nesting success, hatching success, nest initiation dates, clutch size)	numbers per colony/various species			
		Salt-pond carrying capacity model	western sandpiper	n/a	n/a	n/a
		Salt-pond carrying capacity model	American avocet	n/a	n/a	n/a
		Salt-pond carrying capacity model	ruddy duck	n/a	n/a	n/a
Salt-pond carrying capacity model	northern shoveler	n/a	n/a	n/a		
<b>Topic 7 - Effects of Restoration on Fish Assemblages</b>						
Monitoring the Response of Fish Assemblages to Restoration in the South Bay Salt Ponds	James Hobbs, University of California Davis	benthic beam trawl/otter trawl - ID and length	whole body/various fish and invertebrates	3-5 replicate trawls/pond monthly or bimonthly	Ponds 19, 20, 21; Coyote Creek; Mount Eden Creek; Old Alameda Creek	TBD
		seine nets - ID and length	whole body/various fish and invertebrates	3-5 replicate trawls/pond every month or bimonthly	Alviso Slough fringing marsh, Pond SF2, Outer Bair Island	TBD
		baited minnow traps - ID and length	whole body/various fish and invertebrates	30/pond every month or bimonthly	Ponds A6, A8, Alviso Slough fringing marsh; Ponds E8A, E9, E8X; Pond SF2; Outer Bair Island	TBD
		fyke net - ID and length	whole body/various fish and invertebrates	monthly or bimonthly	Ponds A8, SF2; Outer Bair Island	TBD
		fish health - weight, length, otoliths	whole body/head/longjawed mudsucker	8-10 fish/habitat type every month or bimonthly	Ponds 19, 20, 21; fringing marsh adjacent to Ponds A6 and A8; Eden's Landing & Ravenswood locations	TBD
		survival - mark/recapture	whole body/head/longjawed mudsucker	500 fish marked	TBD	1
		tidal stage, temp (°C), salinity (‰), specific conductance (mS), water transparency (secchi depth in cm), and dissolved oxygen (mg/l and % saturation)	water	?	Ponds 19, 20, 21; fringing marsh adjacent to Ponds A6 and A8; Ponds A6, A8, SF2, E8A, E9, E8X; Mt. Eden Creek, Old Alameda Creek; Outer Bair Island	1/each location
<b>Topic 8 - California Gull Displacement Studies</b>						
California Gull Displacement and Predation on Breeding Waterbirds	Josh Ackerman, USGS	remote digital camera video	nest predation/snowy plovers chicks	20-25 nests/breeding season	TBD	5
		radio telemetry	nest predation/Forster's tern chicks	up to 30 transmitters per colony per year	TBD	?
		body condition	weight and size/Forster's tern chicks	up to 30 chicks	TBD	?
		color-band chicks and adults	alpha-numeric bird bands/California gull movement/ California gull	500	Pond A6	1
		gull movement	weekly re-sightings/season		Pond A1, Pond A6, Mowry, Coyote Hills	4
		gull nest counts	nest number and location/California gull	1/season	Pond A1, Pond A6, Pond A9/A10, Coyote Hills and Mowry	5
<b>Topic 9 - Graduate Fellows</b>						
Modeling Bird Abundance and Habitat Value	Nicole Athearn, UC Davis	bird abundance model using habitat selection parameters	western sandpiper, American avocet, ruddy duck, northern shoveler	n/a	n/a	n/a
Effects of the South Bay Salt Pond Restoration on Mud Flats and their Carrying Capacity for Shorebirds	Aariel Rowan, SF State U	carrying capacity of mudflats for shorebirds	western sandpiper	n/a	n/a	n/a

Monitoring Invasive Algerian Sea Lavender Using Multispectral Satellite Imagery	Gavin Archbald, SFStateU	develop GIS-based habitat model	Algerian sea lavender	n/a	n/a	n/a
		survey forms and photos	Algerian sea lavender	TBD	TBD	TBD
		supervised classification and object based image analysis	Algerian sea lavender	n/a	n/a	n/a
		comparison of satellite and aerial imagery	Algerian sea lavender	n/a	n/a	n/a
California Clapper Rail Population Ecology	Cory Overton, UC Davis	radio telemetry data	movement patterns/clapper rail	n/a	n/a	n/a
		radio telemetry data	survival rates/clapper rail	n/a	n/a	n/a
		radio telemetry data	reproductive rates/clapper rail	n/a	n/a	n/a
		radio telemetry data	habitat use model/clapper rail	n/a	n/a	n/a
		radio telemetry data	efficacy of survey methods/clapper rail	n/a	n/a	n/a
		Hg analysis	whole blood/clapper rail	n/a	n/a	n/a
		Hg analysis	feathers/clapper rail	n/a	n/a	n/a
		Hg analysis	failed-to-hatch eggs/clapper rail	n/a	n/a	n/a

Monitoring Studies	Principal Investigator	Data type	Matrix/species	Sample events/year	Locations	# of Locations
Waterbird Use of Commercial Salt Evaporation Ponds in South San Francisco Bay	Jill Bluso Demers, SFBBO	bird use surveys	counts/various waterbirds	monthly high tide surveys	Carghill salt ponds -- Mowry, Coyote Hills	22 ponds
		bird use surveys	bird behavior and habitat use	monthly high tide surveys	Carghill salt ponds -- Mowry, Coyote Hills	
		water quality data- Hydrolab Minisonde	water/ ph,temp, DO, conductivity (converted to salinity), specific gravity (ponds over 70 g/l)	monthly high tide surveys	Carghill salt ponds -- Mowry, Coyote Hills	22 ponds
Waterbird Use of Managed Ponds	John Takekawa, USGS	water depth	water/staff gauge	monthly high tide surveys	Carghill salt ponds -- Mowry, Coyote Hills	22 ponds
		bird use surveys	counts/various waterbirds	monthly high tide surveys	Alviso, Ravenswood, Warm Springs, Eden Landing	53 ponds
		bird use surveys	bird behavior and habitat use	monthly high tide surveys	Alviso, Ravenswood, Warm Springs, Eden Landing	53 ponds
		water quality data- Hydrolab Minisonde	water/ ph,temp, DO, conductivity (converted to salinity), specific gravity (ponds over 70 g/l)	monthly high tide surveys	Alviso, Ravenswood, Warm Springs, Eden Landing	53 ponds
Monitoring of Snowy Plovers	Caitlin Robinson-Nilsen	water depth	water/staff gauge	monthly high tide surveys	Alviso, Ravenswood, Warm Springs, Eden Landing	53 ponds
		plover nesting sites and oyster shell placement experiment	counts and location	bi-weekly to weekly	Alviso, Ravenswood, Warm Springs, Eden Landing and others as necessary	(changes depending on nest locations)
Water Quality Monitoring for RWQCB Permit	John Takekawa, USGS	datasondes	water, DO, temp, pH, turbidity	continuous June 1 - Oct. 31, downloaded monthly	A3W, SF2	2 sondes in SF2, 6 sondes in A3W
		pressure transducer data logger	depth	continuous July - Sept. downloaded monthly	A3W	1
		wind speed, air temp, PAR, solar radiance	1 weather station with anemometer	continuous June 1 - Oct. 31, downloaded monthly	A3W	1
		Nutrients (ammonium, nitrate, DIN), trace metals	grab water samples	weekly, July - Sept.	A3W	2 grab samples per sonde location
		Chlorophyll A	grab water samples	at minimum, monthly July - Sept	A3W	1-2 grab samples at each sonde location
		porewater profile (SOD, nutrients, metals)	SOD profilers	monthly July - Sept	A3W	2 sites
		Sediment Oxygen Demand	core incubators	monthly July - Sept	A3W	at each sonde location
		Biochemical Oxygen Demand	dark bottles	monthly July - Sept.	A3W	at each sonde location
		minisondes	DO, salinity, temp, pH	weekly June 1 - Oct 31	A7,A14,A16	at discharge location
		minisondes	DO, salinity, temp, pH	Monthly June 1-Oct.31	A3W,A7,A14,A16 receiving waters	at multiple location in adjacent sloughs
SF Bay Shorebird Census	Julian Wood, PRBO	Bird occurrence	shorebirds	2009 (plus data write up in 2010 for 3 years of current data and 3 years of 1980s data)	Bay-wide	Bay area-wide including all FWS and DFG lands
Pond A3W Trail Waterfowl Study	Lynne Trulio, SJSU	waterfowl response to trail use, before and after trail opening	waterfowl	4 months X 10 observation periods/month	Pond A3W (Moffett Trail)	1 (reference: Pond A9 study)
Alviso Shoals Study	John Takekawa, USGS	bird use surveys	bird behavior and habitat use	monthly during low tide	Alviso Shoals	selected subsections of shoals
		sediment core samples	identify benthic invertebrates	monthly during low tide	Alviso Shoals	20-30 locations

USGS Research Study	Principal Investigator	Data type	Matrix/species	Sample events/year	Locations	# of Locations
Takekawa, et al. 2010 "Effects of regional wetland restoration on shoals of the South San Francisco Bay: migratory bird ecology foot webs, sediment supply and mercury contamination"	Dave Schoellhamer	sediment flux into south SF Bay	sediment	continuous	Dumbarton Bridge	1
		sediment gauge	sediment input from Coyote Creek	continuous	Coyote Creek	1
	Bruce Jaffe	bathymetry of shoals	side-scan interferometer and LIDAR	5 surveys at Dumbarton; 3 - 4 surveys at Pond A6 shoals and Alviso Slough	2009 - SF2; 2010 - SF2 and Pond A6 shoals and Alviso Slough	continuous coverage
	John Takekawa	sediment cores	benthic invertebrates	monthly	SF2 shoals	3 transects/9 cores /transect/3 reps = 81 cores per sample event
	Josh Ackerman	wind waves, sediment concentration, bed elevation, salinity and temp	shoals characteristics	monthly	SF2 shoals	3 transects/9 cores /transect/3 reps = 81 cores per sample event
		bird use surveys	counts/various waterbirds	monthly	SF2 shoals	multiple
		Hg Analysis	whole body/longjawed mudsucker	Every 6 weeks from April - August	SF2 Shoal, Alviso Shoals; Alviso Slough (2 locations)	4
	Hg analysis	various waterbird eggs	up to 15 eggs/colony	Pond A8, A2W, AB1, A16, New Chicago Marsh, SF2	6	
Ackerman 2010 "Contamination in the Endangered California Clapper Rail: Developing Non-invasive Tools for Sampling Contaminants in Endangered Species"	Josh Ackerman	Hg analysis	California clapper rail (CLRA) blood, head feathers, breast feathers and failed-to-hatch eggs	Over 300 archived samples from 125 individual CLRA inhabiting 4 marshes in South SF Bay during 2007 - 2010.	Laumeister Marsh, Arrowhead Marsh, Cogswell Marsh, and Colma Crkee marsh in South SF Bay	4