

CITIZEN SCIENCE IN SAN DIEGO

October 19, 2012

Meeting Notes

An organizing meeting was held on Friday, October 19, 2012 from 8:30 to 10:30 am at the San Diego Zoo Global Administrative Center, with 26 attending. The discussions were lively and are summarized in this meeting report.

Why are you here, at this meeting?

Learn more about citizen science

- Create authentic science learning through citizen science
- Provide public science-based programs
- Organize students and citizens to contribute to ecological monitoring
- Engage public in collecting data for conservation values
- I'm curious about what others are doing!
- Learn more about other citizen science projects in San Diego (4)
- Share experiences with others doing citizen science
- Learn about best practices for citizen science
- Collect data for local research projects
- Meet local colleagues interested in citizen science (2)
- Evaluate community engagement in conservation (in Master's program)

Enhance science education through citizen science

- Bring more nature-based experiences into science curriculum through citizen science
- Provide research experiences for students
- Experiences for bright middle school students
- Use citizen science projects in educational programs
- Suggest opportunities to teachers in (Poway) school district
- Increase science elements in schoolyard habitat programs
- Bridge scientists and students at UC San Diego with high school students
- Connect university students with active science projects

Enhance local programs that (could) incorporate citizen science:

- Invite volunteers to assist with sorting, preparing and identifying arthropod collections
- Locate additional resources for current projects (plankton sampling, water quality)
- Contribute to US Fish and Wildlife refuge programs, that call for science-based land management and public involvement-education
- Identify cooperators for funded landscape-wide long-term project organized by California Department of Fish and Game
- Reevaluate San Diego Tracking Team relevance and approach
- Get volunteers for the San Diego Tree Map inventory project
- Offer local restoration project areas for data collection
- Better use volunteers to increase scientific information gathered for City's open space areas
- Invite more people to participate in volunteer projects on the San Diego River
- Identify opportunities for all departments at the San Diego Zoo Global
- Monitor impacts of rock climbing activities
- Gather monitoring data on San Elijo Lagoon
- Increase participation in QuakeCatcher net

What do you want to get out of a citizen science project?

Experiences:

- Make science “real” and “alive!”
- Allow those “ah ha!” moments
- Do science instead of talking about science

Conservation:

- Pride in San Diego’s nature and biodiversity
- Raise awareness of and engage public in advocating for environmental issues
- Fragmentation and importance of wildlife corridors
- Biodiversity
- Value of trees and other urban vegetation
- Stimulate stewardship of local environments
- Develop environmental ethics
- Connect people to local nature
- Gather evidence for long-term environmental change
- What species do we have in SD County? (of bees, wasps, etc.)

Education:

- Bring authentic learning to the classroom
- Meet Next Generation Science Standards with nature-based science experiences
- High school community service hours
- Create experiences for young children (6- to 7-year-olds) to contribute
- Generate interests in future careers

Citizen engagement:

- Meet scientists and science-educated professionals
- Reduce barriers between scientists and non-scientists, students and adults, communities of low and high incomes and low and high environmental quality
- Engage people directly with the environment, instead of “don’t touch!”
- Provide outdoor experiences
- Increase well-being and positive experiences
- Get people away from their office-building work settings
- Provide structure for outdoor and nature experiences

Technology:

- Use latest technologies to communicate with public and to collect data
- Connect to youth through their iPhones, apps and social media
- Display data online with attribution to collectors (“that’s my specimen!”)

Data collection:

- Gather large volumes of data
- Gather data for current research or monitoring projects
- Collect data for a specific issue or question
- Process lots of specimens (35,000 arthropods collected on Point Loma)
- Get scientists to see how quality data can be collected
- Quality control procedures
- How science questions can be posed to allow for trained non-professionals to collect data or specimens
- Value of quantity of data that can be collected

Science values:

- Publish data from citizen science project
- Identify stakeholders for issues, science questions, and data collection
- Sustain long-term data collection after funded project is completed
- Plan, organize, collect and analyze data for funded landscape-wide long-term project, for Department of Fish and Game (Karen Miner)
- Sustain and expand long-term monitoring program, such as Stream Team

What do you want to get out of participating in a network of citizen science participants?

Increase science impact and program effectiveness

- Bring information together over broad geographic areas (global, continental, southern California, San Diego county)
- Consider San Diego County to be a “wide belt transect” (ocean to mountains to desert)
- Possible eco-tourism opportunities
- Use results for policy changes, conservation actions
- Enhanced value with volunteer contributions (\$50,000 for Point Loma arthropod collection, additional \$250,000 equivalent by volunteers)
- Advantage of collaborative projects for funding proposals, multi-organizational teams(2)
- Effective use of resources, working together, using volunteers
- Gain access for collecting on public lands

Networking and coordination

- Learning from others with shared interests and similar projects (2)
- Meet people that I’ll connect to colleagues at UCSD
- Strength in numbers, to expand projects
- Reduce redundancy
- Share funding opportunities, announcements
- Identify existing projects that students and others can participate in
- Contribute matching hours for projects, both professionals and volunteers
- Share lessons learned

Strengthen science

- Adapt methods to Mediterranean climate
- Provide evidence that citizen science is valuable and valid for science questions and issues (start with paper in Frontiers issue)
- Share methods and study designs
- Efficient “beta testing” of methods and projects
- Conduct robust scientific analysis of data
- Provide statistical analyses to show the value of collecting large amounts of data

What do we want to learn together?

- Workable methodologies and protocols for using various levels of skills
- Web and online interface for data entry and analysis
- Get web designers to create interface with public
- Create videos with methods
- Use students to design web applications and online interfaces
- Field trips to see projects and meet collaborators
- Share the stories about projects and successes
- Best practices (see toolkit on www.citsci.org)
- Use Wiki page and Webinars to share information

Next steps:

Share information

- Summarize and distribute notes from this meeting
- Assemble and share list of current citizen science projects
- Post articles, documents, opportunities, and ideas on Wiki page
- Take time to join Wiki page, invite colleagues, contribute items, and browse periodically
- Organize folders, pages, sidebars, reading room and other elements to support citizen science network

Set priorities for working together on a limited number of citizen science projects

- Current projects that need data collection
- Projects relevant to local issues, science questions, and biodiversity
- Projects that have well-developed methods
- Share information through other communication modes (few have experience with Wiki pages yet)

Identify barriers, then identify resources to approach/overcome these barriers

- Host meetings (Tijuana River Estuarine Research Reserve, Living Coast Discovery Center, San Diego River Park, Department of Fish and Game)
- Hold indoor meetings at central locations
- Hold meetings quarterly or bi-monthly, more frequently to start
- Consider both “open” (attend when you can) and “committed” (expect that participants will attend most meetings)
- Establish working groups, perhaps at next meeting
- Seek funds to implement coordinated projects
- Be clear about purpose of this group
- Continue to ask, “what activities matter to you and your organization?”

Next meeting:

- Monday, December 10, 4:00 to 6:00 pm
- Identify location, set up Evite invitation
- Consider adding teleconference call or Webinar to increase participation

Contacts for next several months:

- Shelley for communication among participants (sqlenn@ucsd.edu)
- Anne for meeting notes (fege@sandiegoaudubon.org)
- Mary Ann for Wiki page (hawkema@gmail.com)
- James Danoff-Burg also (idanoffburg@sandiegozoo.org)
- Someone to host and organize next meeting

Needs identified from post-it notes:

- How to figure out which projects fit best?
- Projects that can handle a rotating volunteer base
- How to get involved
- Web design
- Graphic design
- Database creation
- Online databases for entering data
- Projects we can get teachers/students involved all across the county, more local connections and close to schools

- For a facility that does not currently have funds to start their own project, there is a need to understand how to best get involved in existing projects
- Can someone become a “secondary trainer?”
- Perhaps only a few site visits or collections

Additional information from participants

Most participants provided answers to the following questions, and their responses are collated on the pages that follow.

1. Have you organized or participated in any citizen science projects in San Diego?
2. What do you want to get out of a citizen science project? (who are you, why are you here?)
3. What do you want to get out of participating in a network of citizen science participants?
4. What are your two main obstacles or barriers for doing citizen science?
5. What three relevant local science questions (yours or others) could be expanded to involve more scientists, land managers, naturalists, students, and adults?
6. Indicate your reasons for interest in citizen science

Indicate your reasons for interest in citizen science: (1=most interested, 2=next.... 5=least)

- | | |
|------------------|---|
| [Mean score 3.9] | <input type="checkbox"/> A science activity for one class or event |
| [Mean score 3.3] | <input type="checkbox"/> Be part of an existing citizen science project |
| [Mean score 2.0] | <input type="checkbox"/> Contribute to and compare results on regional, national, international scale |
| [Mean score 1.2] | <input type="checkbox"/> Start a citizen science project to answer local conservation questions |
| [Mean score 3.0] | <input type="checkbox"/> Get more data for a research project |

Meeting organizers were Mary Ann Hawke, James Danoff-Burg, Shelley Glenn, and Anne Fege. Contact Anne regarding corrections to these notes, fege@sandiegoaudubon.org, 858-472-1293

CITIZEN SCIENCE IN SAN DIEGO

October 19, 2012 Meeting Responses to One-page Survey

2. What do you want to get out of a citizen science project? (who are you, why are you here?)
- Information to create, advocate and implement resource management for SD River watershed, site specific
 - Our experience is primarily in environmental education and nature centers. These existing programs with thousands of students participating annually may be good partners or target groups or participants in CS projects.
 - Engage communities in conservation
 - Working with the numbers of specimens and the huge amount of data, the citizen scientists allow us to process material for more meaningful projects.
 - Baseline data, community outreach
 - Greater scientific validity. Really using this material for peer-reviewed publications.
 - Develop a deeper, more meaningful relationship with those who are passionate about wildlife conservation. Engage new stakeholders.
 - CDFG needs help to develop a strategy for landscape-scale biodiversity change detection that incorporates existing efforts.
 - I want to find out which projects already exist and are currently recruiting school-age children.
 - Engage public and gather data. Become stewards. Enhance educational opportunities.
 - Reduce the effects of habitat fragmentation.
 - Unknown. Let's see how it evolves.
 - Processing of our data is the main thing, but also to increase local citizens' awareness of the amazing diversity here in San Diego county and then to get them to advocate for it.
 - Collaboration, authentic learning experiences for students, active involvement of univ. scientists
 - Meaningful data that has been collected with well-tested methods, quality control, and applicability to science questions.
3. What do you want to get out of participating in a network of citizen science participants?
Resources, best management practices, grants, and project coordination
- It is not readily apparent if/how citizen scientists could contribute to our regulatory, required monitoring. How can we partner/support/integrate existing programs with citizen science group.
 - Opportunities for introductions, reduce redundancy
 - I enjoy seeing folks learn more about their environment, as that leads to appreciation. Also, with the help of citizen scientists, we can do meaningful, larger scale projects.
 - Putting together resources. Connecting land managers with our students and teachers.
 - Learn more about best practices. Forum in which to share new opportunities and lessons learned.
 - Key to developing an interconnected program.
 - I want to see kids get excited about being able to do something.
 - Shared best practices. Protocols and methodologies. Help coordinate regional activities. Complimentary efforts. Data-sharing forum.
 - We want to know what's going on elsewhere, and feedback from the scientific community.
 - I am most interested in learning best practices from other participants and in getting buy-in from institutions and schools in San Diego to help us in our citizen science projects here at the Zoo
 - Collaboration, excitement, leveraging opportunities, helping to grow the field in San Diego

- Others collecting similar data in San Diego. Students in middle and high school, community colleges and universities collecting data. Quality scientific data for key local environmental/ecological questions
3. What are your two main obstacles or barriers for doing citizen science?
- Data management. Getting decisionmakers/stakeholders to pay attention to results as valid (legitimacy of CS)
 - Funding. TransNet Environmental Mitigation Program will be funding a new grant cycle in February (announce in November) with line items for citizen participation.
 - Time, validity of results
 - Project funding to run desired activities
 - Volunteer retention. Data quality. Knowing your target group, not all projects can reach all groups.
 - Funding for coordinators. Teacher scheduling and engagement.
 - Identifying projects where people can participate meaningfully (permit and animal handling constraints). Data quality control concerns. Funding.
 - Lack of faith that CS produces valid data. Lack of time to organize volunteers.
 - Knowledge of what is available already. Knowledge of where to go, to get started.
 - Time to set up programs. Resources = funds + CS labor + leaders
 - Getting volunteers and growing leadership.
 - Having ways to get the data out to student or citizen groups so that it can be processed (for example, we have tens of thousands of images that need to be processed and we don't yet have a clear way to go forward) – better put: digital expertise
 - Knowledge of practice, scientists willingness to work with and/or trust public/students to do meaningful and valid work, logistical coordination
 - Methods that don't work and then participants get discouraged. Sustaining the data collection and administrative structure over many years
4. What three relevant local science questions (yours or others) could be expanded to involve more scientists, land managers, naturalists, students, and adults?
- What is amphibian distribution, species and abundance? What is invasive non-native plant distribution, species and abundance?
 - Potentially we could set up part/preserve-based science groups similar to the existing land management/restoration groups. There is great need for preserve-level monitoring (to complement regional monitoring that is funded), i.e. with Friends groups.
 - Arthropod or arthropod sub-groups, Atlas of the County
 - Raptor monitoring, are they nesting/fledging successfully? Where, how, what interactions?
 - Coastal sage scrub and grassland restoration. Home computer analysis of wildlife remote camera trap data. Frozen zoo karyotype digitization.
 - Change in biological communities/ecosystems relative to impacts from climate change.
 - General monitoring data. Restoration outcomes. Plants and animals.
 - Role of specific insects in the region for host plant pollination to Hermes' copper butterflies. Pollination of our sensitive plants in San Diego
 - Ways to follow up with CitSci participants
 - What is the diversity of local pollinators? Changes in the intertidal (species composition, abundance, diversity, etc)? Migration of butterflies, birds, marine mammals
 - What are the long-term ecological effects of frequent wildfires? What are long-term changes in species distribution, related to climate change? What are changes in inter-species synchrony? (plants, pests, pollinators, food sources for local animals, pests)

Have you organized or participated in any citizen science projects in San Diego?

Organization	First name	Last name	CS Project Title	Science question(s)	Data collected	What did scientists gain?
City of San Diego	Betsy	Miller	Gold-spotted Oak Borer	Early warning system for spread of gold-spotted oak borer. Program exist, needs more volunteers and publicity.		
Klein-Edwards Professional Services	Michael	Klein	Insects on Wright's Field in Alpine	Photographed insects and other invertebrates	Diversity of invertebrates on Wright's Field	Appreciation for the uniqueness at Wright's Field
San Diego Natural History Museum	Jim	Berrian	What is the arthropod diversity on Point Loma? Where is the diversity? When are taxa active? Is there habitat specialization?	Trap localities w/ GPS. Habitat/microhabitats by localities. Dates of collections. Recorded taxa IDs and traps in which specimens were caught. Dates.	Time. The scientists were able to concentrate on statistical workup, reporting, synthesizing data.	Participants learned arthropod anatomy, types of insects in their community, general insect-arachnid biology through questions, inspired by what they were identifying.
San Diego Natural History Museum	Layle	Aerne Hains	What is the flora of SD County? What do we know about this flora?	Collections-based project. Volunteers collect specimens. The data can then be extracted from specimen data, such as distribution, phenology, etc.	Plant specimens and data. Can be a baseline for future research.	They are connecting with local flora and learning more about biodiversity in our area. They are contributing to scientific research, which is very important to many of our volunteers.
San Diego River Park Foundation	Shannon	Quigley Raymond	San Diego River Trash and Non-native Plant Survey	What is the abundance, source and distribution of trash and invasive non-native plants in SD River corridor?	Location, volume, canopy coverage	Knowledge, restoration project success, abundance distribution
San Diego River Park Foundation	Shannon	Quigley Raymond	San Diego River Water Quality Survey	What is baseline water quality for lower SD River? What are ambient water quality conditions for SD River?	General water chemistry, nutrients and toxicity	Baseline water quality conditions, monthly trends over 8 water years

Organization	First name	Last name	CS Project Title	Science question(s)	Data collected	What did scientists gain?
San Diego Tracking Team	William	Sulzbach	Habitat fragmentation.	Key mammal species presence (tracks, scat, and other sign). Also roadrunner and burrowing owls.	Land managers and urban planners use the data.	They become better naturalists.
San Dieguito River Valley Conservancy	David	O'Connor	Periodic monitoring		Periodic information on water quality, fauna, vegetation monitoring, restoration.	
UCSD ScienceBridge	Johnnie	Lyman	Categorizing native and non-native plant species in canyons near schools.	GPS of different plants	Adding to plant databases	Knowledge of native and non-native plant species.

Current and Potential Citizen Science Projects in San Diego (from post-it notes)

Organization	CS Project Title	Science question(s)	Data collected
California Center for Sustainable Energy	County-wide Tree Inventory	Where are the trees and what ecosystem benefits do they provide?	Locations, size, species of trees
California Department of Fish and Game	South Coast Region Landscape-Scale Monitoring	South Coast region-wide (landscape scale) change detection in biodiversity and environmental co-variate stressors	
California Department of Public Health	Pre-harvest Shellfish Protection and Marine Biotxin Monitoring Program		Phytoplankton sampling in Imperial Beach, at Tijuana River NERR
Michael Klein, KEPS	Wandering Skipper Surveys on State Park land	Map and document wandering skippers	None
Michael Klein, KEPS	Invertebrates on Wright's Field in Alpine	Worked with Joan McQueen Middle School Teacher Brendon Casey	40 species of insects collected in 4 years on this site
Quake Catcher Network	Seismic Sensors		Year 2 of 3-year project
San Diego National Wildlife Refuge	Refuge Monitoring	Inventory of habitats on refuge lands	
San Diego National Wildlife Refuge	Species Monitoring	Monitor species covered by MSCP, to be determined	
San Diego Natural History Museum	All-taxa Arthropod Survey of		Arthropod specimens,

Organization	CS Project Title	Science question(s)	Data collected
	Point Loma Navy Bases		preserved and identified
San Diego River Park	River Blitz	Distribution of non-native invasive plants	
San Diego River Park	River Watch	Water quality monitoring	
San Diego River Park	Quagga and Zebra Mussel Early Detection Monitoring		
San Diego River Park	Fire Recovery Photo Monitoring		
San Diego River Park	Wildlife Camera Traps		
San Diego River Park	River Mouth Dune Habitat		Vegetation quadrats
San Diego Tracking Team	Tracking	What are distributions of key mammals, roadrunner, and burrowing owl in SD County?	
San Diego Zoo Institute for Conservation Research	Camera Trap Photo Data	Sort though photos collected by researchers at different sites around the world	
San Diego Zoo Institute for Conservation Research	Ground Squirrels	Presence/absence of ground squirrels in various locations	
SD Canyonlands	Possible canyon monitoring	Existing Friends groups who focus on restoration and land management may be intersted in adding a preserve monitoring focus. This would compliment the regional monitoring for MSCP funded by SANDAG	
SD Coastkeeper and Surfrider Foundation	Water Quality Monitoring		Water quality monitoing at Tijuana River NERR
UCSD ScienceBridge	Students in Nature	Bringing high school students into their local canyons and open spaces to do authentic science projects	For example, surveying bees for scientists studying bees at UCSD