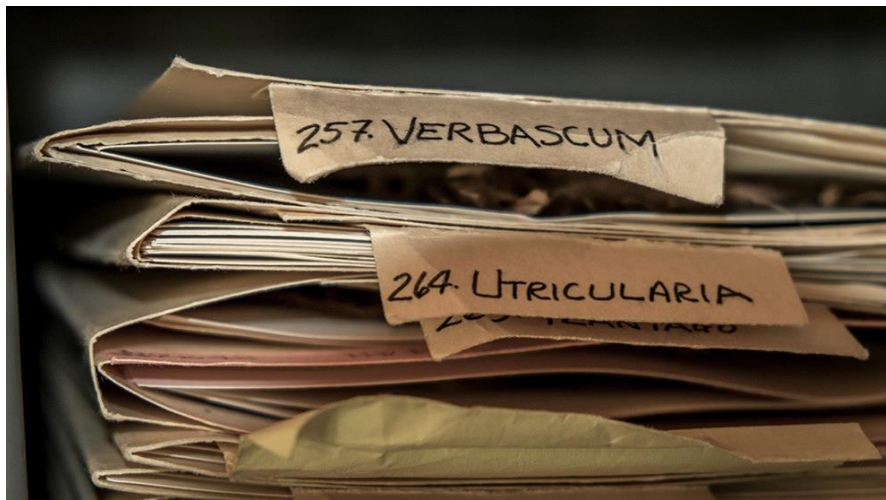


# **WHY BOTHER WITH SMALL COLLECTION DIGITIZATION?**

**BENEFITS TO FIELD STATIONS**

# SAGEHEN TEACHING COLLECTIONS

DEVELOPED 1951-C.1970





# OUR HERO!...

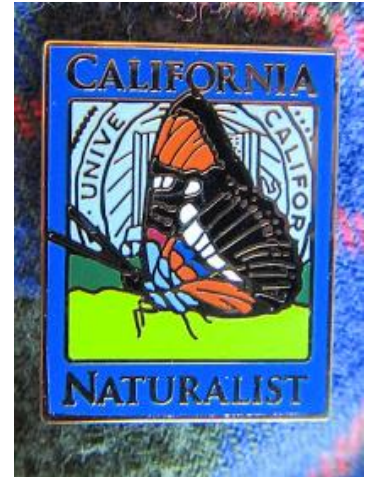
**ERICA KRIMMEL**





# CALIFORNIA NATURALIST

## CERTIFICATION TRAINING





# **CURATION, DIGITIZATION, SHARING...**

**WITH THE AID OF VOLUNTEERS, FREE TOOLS, NEW PARTNERS**



# ...AND EXPANDED!



- 60+ new voucher specimens for Sagehen herbarium;
- 200+ new vouchers for the North Fork of the American River, including
- 17+ species new to that basin list.



# RELATIONSHIPS STRENGTHENED

WITH ASSOCIATED RESEARCH PROPERTIES, CAMPUS

- Historical family collection scanned;
- Biota list expanded;
- Herbarium collection begun;
- Research requests triggered.



# iNATURALIST CITIZEN SCIENCE

**PUBLIC ENGAGEMENT, NEW RESEARCH DATA, VALIDATION OF BIOTA LISTS, DISCOVERY OF NEW SPECIES**

**naturalist.org** Observations ▾ Species ▾ Projects ▾ Places Guides People 0 0 faerth

[Home](#) > [North America](#) (Continent) > [United States](#) (Country) > [California](#) (State) > [Nevada](#) (County) > [Sagehen Creek Basin, CA, US](#) Land Feature

Find a place

Map data ©2015 Google Terms of Use Report a map

Species Guide Observations Projects People About Sagehen Creek Basin [Add an observation](#) | [Embed place widget](#) | [Edit](#)

**399** of 1007 confirmed

Search for species   Colors Establishment  Threatened

All life

- Animals
  - Arthropods
    - Chelicerates
    - Arachnids
    - Hexapods
    - Insects
  - Chordates
    - Vertebrates
      - Ray-finned fishes
      - Amphibians
      - Birds
      - Mammals
      - Reptiles

<b>Sierra juniper</b> ( <i>Juniperus grandis</i> )	<b>ranger's buttons</b> ( <i>Sphenosciadium capitellatum</i> )	<b>common yarrow</b> ( <i>Achillea millefolium</i> )	<b>Sierra Tiger Lily</b> ( <i>Lilium parvum</i> )	<b>Lodgepole Pine</b> ( <i>Pinus contorta</i> )
<b>Columbian Monkshood</b>	<b>Oregon Checker-mallow</b>	<b>Oregon saxifrage</b>	<b>scentbottle</b>	<b>slender cinauefoil</b>



# DOCUMENTING BASIN BIOTA



Since 2012...

4000+ OBSERVATIONS

600+ SPECIES

100+ CONTRIBUTORS

We're getting species verification, plus distribution and movement data for the first time ever.

# NEW SPECIES DISCOVERED!

**EVEN AFTER 65-YEARS OF COLLECTING IN THE SAGEHEN BASIN**

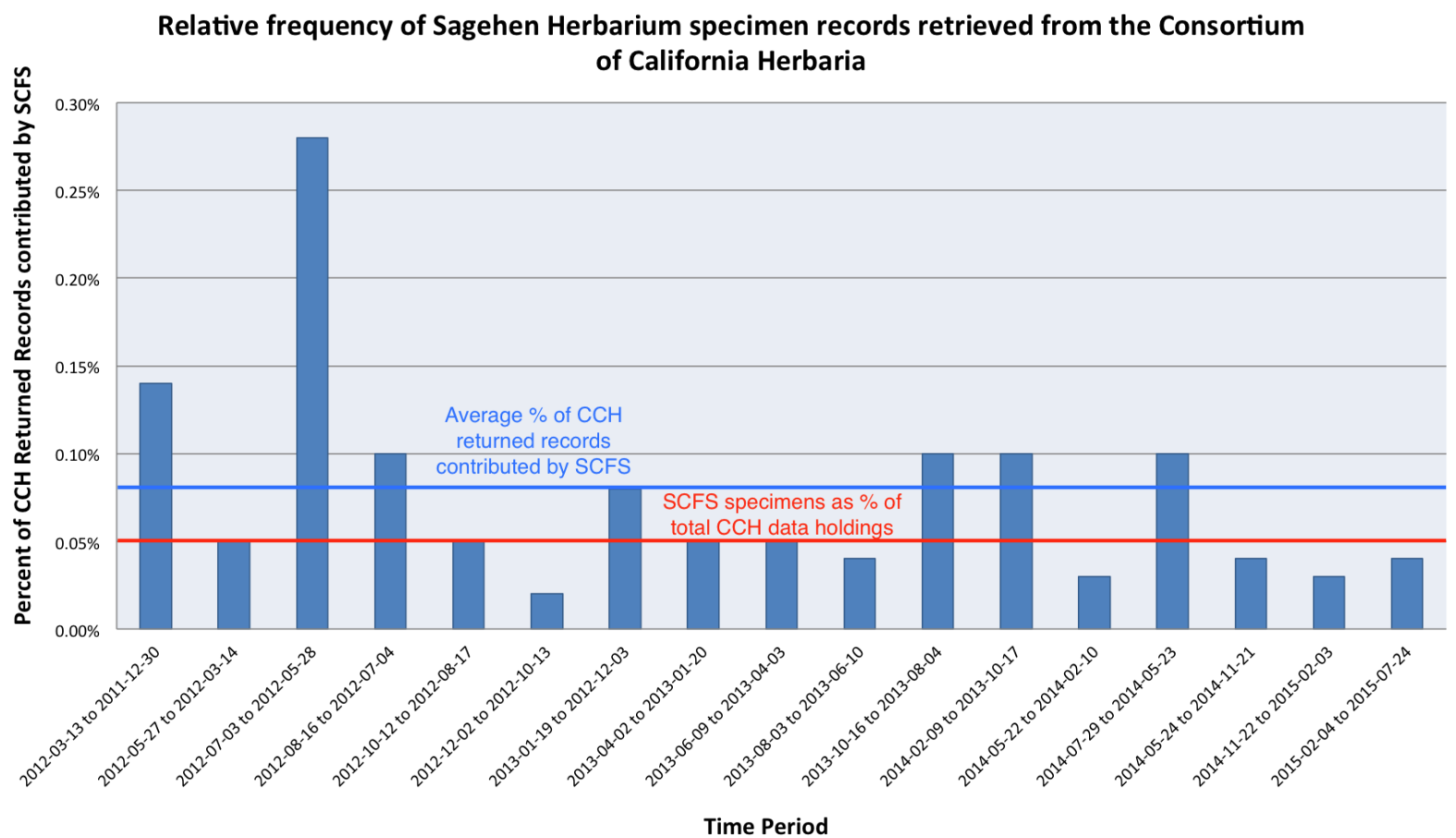
*Arceuthobium abietinum*, *Cordylanthus tenuis*, *Artemisia tridentata* subsp. *wyomingensis*, *Elodea canadensis*, *Ptychostomum pseudotriquetum*, *Ranunculus aquatilis*, *Securigera varia*, *Grindelia camporum*, *Warnstorfia exannulatum*, *Actaea Rubra*, *Maianthemum racemosum*, *Solchus oleraceus*, *Crepis occidentalis*, *Asclepius speciosa*, etc. (and, **most are neither tiny, nor weeds!**)





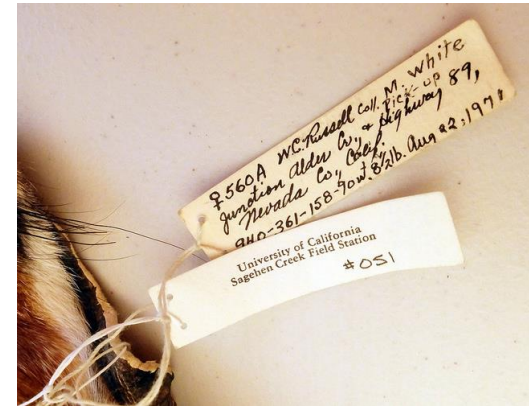
# OUR DATA IS BEING USED

VIA PARTICIPATION IN REGIONAL, NATIONAL AND INTERNATIONAL BIODIVERSITY DATABASES



# RESEARCH REQUESTS TRIGGERED

- New *Ceanothus* hybrid
- *Mimulus* niche adaptation
- Population modeling of *Speyeria* (fritillaries)
- Sierra red fox genetics
- Collections provide a source of isotopes





# WE'RE GETTING NEW PUBLICATIONS

- Data publication in regional, national and international biodiversity databases, including GBIF, Calflora, BISON, California Consortium of Herbaria (CCH), Symbiota, Berkeley Initiative in Global Change Biology (BIGCB), etc.
- Master's thesis (Krimmel, 2014).
- Collections Activity Report, 2014 (Krimmel, 2014).
- Peck, Cook, 2013. **Systematics and distributions of the genera *Cyrtusa* Erichson, *Ecarinosphaerula* Hatch, *Isoplastus* Horn, *Liocyrtusa* Daffner, *Lionothus* Brown, and *Zeadolopus* Broun of the United States and Canada (Coleoptera: Leiodidae: Leiodinae: Leiodini)**. *Insecta Mundi*, Articles 0310-0313.
- Trager 2013b. **Global revision of the dulotic ant genus *Polyergus* (Hymenoptera: Formicidae: Formicinae: Formicini)**. *Zootaxa* 3722: 501–548.
- Graening, Shcherbanyuk, Arghandiwal, 2014. **Annotated Checklist of the Diplura (Hexapoda: Entognatha) of California**. *Zootaxa* 3780 (2): 297-322.
- Kanturski, Weiczorek, 2015. **A new species of the nearctic gall-forming genus *Tamalia* Baker (Hemiptera: Aphididae: Tamaliinae)**. *Zootaxa* 3926(2):268-278.
- Rosa, Vårdal, 2015. **An annotated catalogue of the types of Chrysididae (Hymenoptera) at the Swedish Museum of Natural History, Stockholm, with brief historical notes**. *Zookeys* (495): 79–132
- **More!**

# A Modified Knowledge-Value Chain\*

{  
The  
Domain  
of  
Science  
}

Data

{  
A  
Sparsely  
Populated  
Domain  
}

Knowledge

{  
The  
Domain  
of  
Politics  
}

Wisdom/  
Empathy

Policy

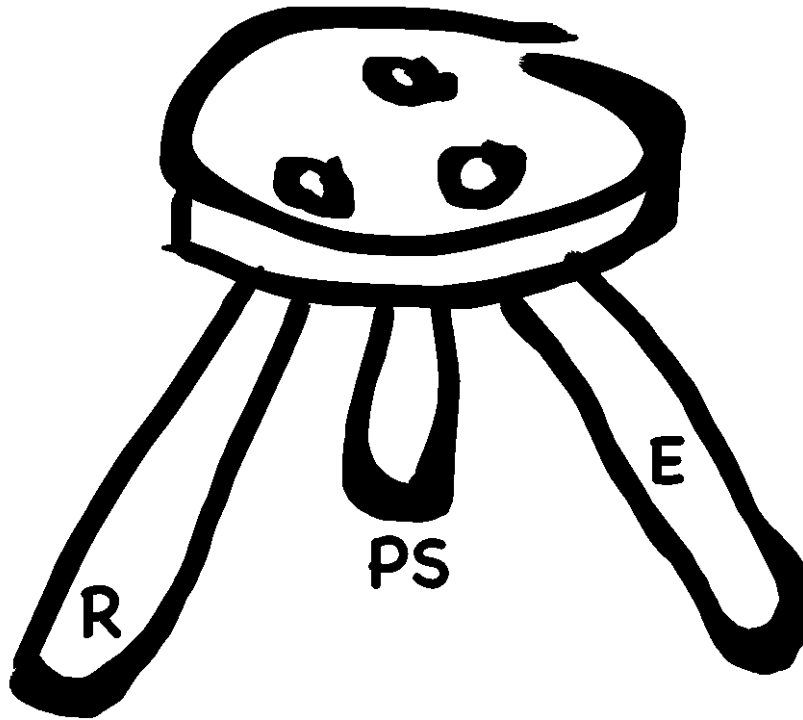
Action

\* After Schubel, 2014.



# SMALL COLLECTIONS ARE IMPORTANT!

**VOLUNTEERS NEED TO KNOW THAT THEIR CONTRIBUTION IS MEANINGFUL**



## ***UNIVERSITY MISSION:***

- RESEARCH
- EDUCATION
- PUBLIC SERVICE

# HOW DO I GET STARTED?

## FAST-TRACK: UPLOAD AND MAP YOUR SPREADSHEET OF HERBARIUM SPECIMEN LABEL DATA TO A SYMBIOTA PORTAL...

**Substrate:** The substrate on which the specimen was collected. Mostly used for lichen and bryophyte specimens.

Ex: On basalt, trunk of oak

Darwin Core lumps this information into habitat.

**Associated Taxa:** A list of the names of other species occurring with the collected specimen.

Ex: Quercus, Arctostaphylos, Ceanothus, Rhus, Eriogonum, Salvia

See Darwin Core's [associatedTaxa](#).

**Description:** A physical description of the specimen at the time of collection. This often includes information that can be lost or difficult to observe after the collecting and preservation process.

Ex: Shrub 3 m tall, corolla yellow

See Darwin Core's [dynamicProperties](#).

**Notes:** Any additional notes regarding the specimen.

See Darwin Core's [occurrenceRemarks](#).

**Dynamic Properties:** A list of additional measurements, facts, characteristics, or assertions about the specimen in a format that allows programmatic parsing of the data. See the Darwin Core link below for further details.

Ex: awnLengthInMeters=0.014, heightInMeters=1.5, relativeHumidity=28, airTemperatureInC=22

See Darwin Core's [dynamicProperties](#).

**Life Stage:** Typically used for zoological collections.

Ex:

See Darwin Core's [lifeStage](#).

**Sex:** Typically used for zoological collections.

Ex:

See Darwin Core's [sex](#).

**Individual Count:** Typically used for zoological collections.



# CONTACT US!

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