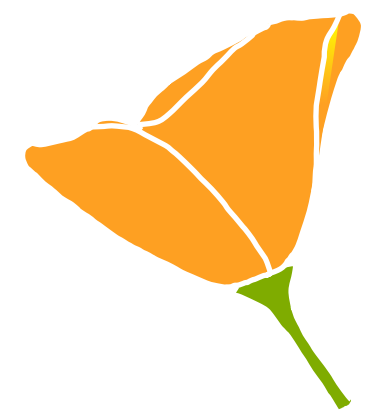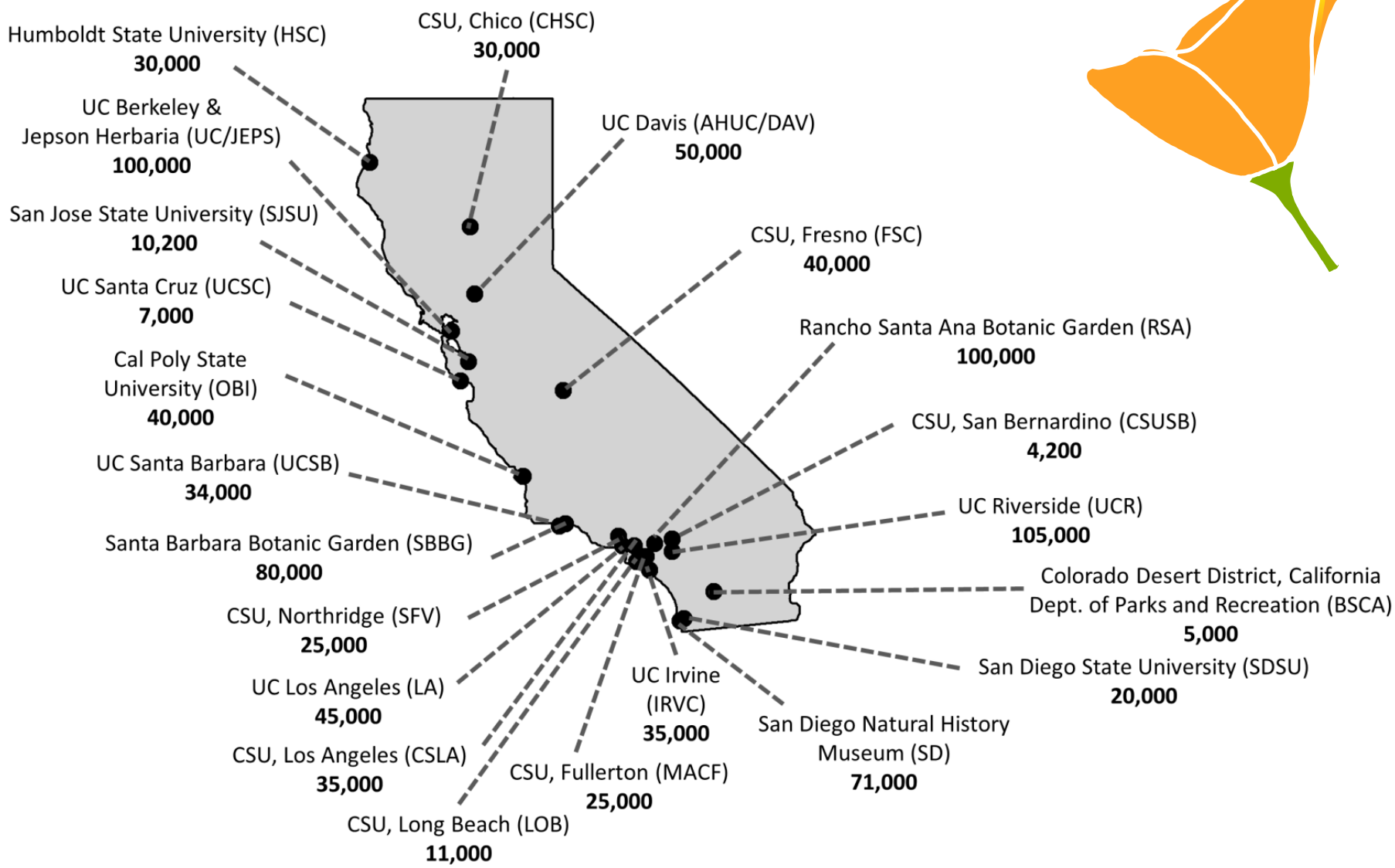# California Phenology TCN: Starting Year 2

Capturing California's flowers: Using digital images to investigate phenological change in a biodiversity hotspot

Humboldt State University (HSC)
30,000

CSU, Chico (CHSC)
30,000

UC Berkeley &
Jepson Herbaria (UC/JEPS)
100,000

UC Davis (AHUC/DAV)
50,000

San Jose State University (SJSU)
10,200

CSU, Fresno (FSC)
40,000

UC Santa Cruz (UCSC)
7,000

Cal Poly State
University (OBI)
40,000

Rancho Santa Ana Botanic Garden (RSA)
100,000

UC Santa Barbara (UCSB)
34,000

CSU, San Bernardino (CSUSB)
4,200

Santa Barbara Botanic Garden (SBBG)
80,000

UC Riverside (UCR)
105,000

CSU, Northridge (SFV)
25,000

Colorado Desert District, California
Dept. of Parks and Recreation (BSCA)
5,000

UC Los Angeles (LA)
45,000

UC Irvine
(IRVC)
35,000

San Diego State University (SDSU)
20,000

CSU, Los Angeles (CSLA)
35,000

CSU, Fullerton (MACF)
25,000

San Diego Natural History
Museum (SD)
71,000

CSU, Long Beach (LOB)
11,000

Building a record of flowering time

From 22 California institutions:

Imaged

Label transcribed

Goal: **904,200 specimens**

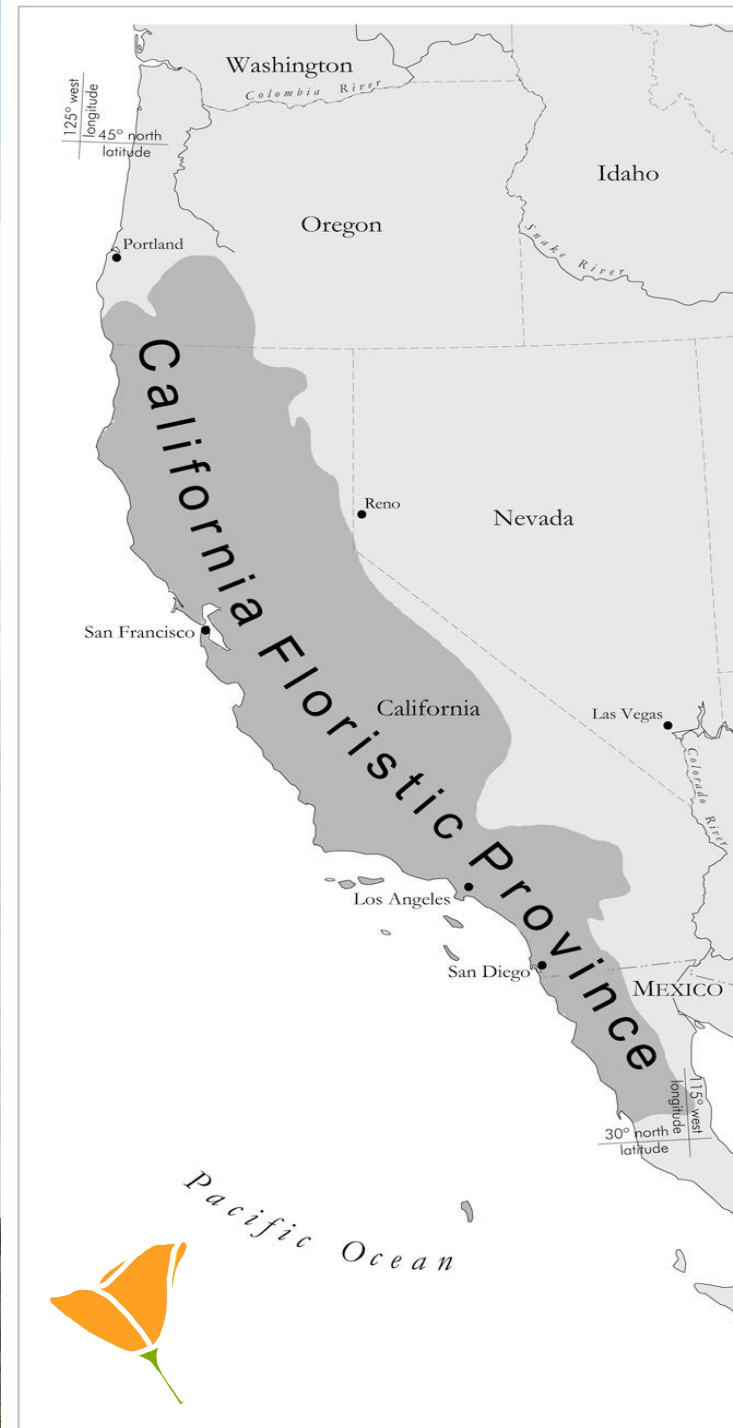**Scored for phenology**

Georeferenced
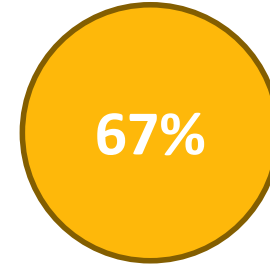
Biodiversity Hot Spot & Mediterranean Climate

California's Flora

- 3 floristic provinces
- ~6,300 native plant species
- ~30% are endemic
- ~30% are annual species
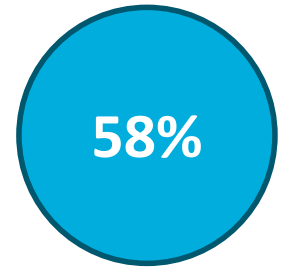- Facing dramatic change
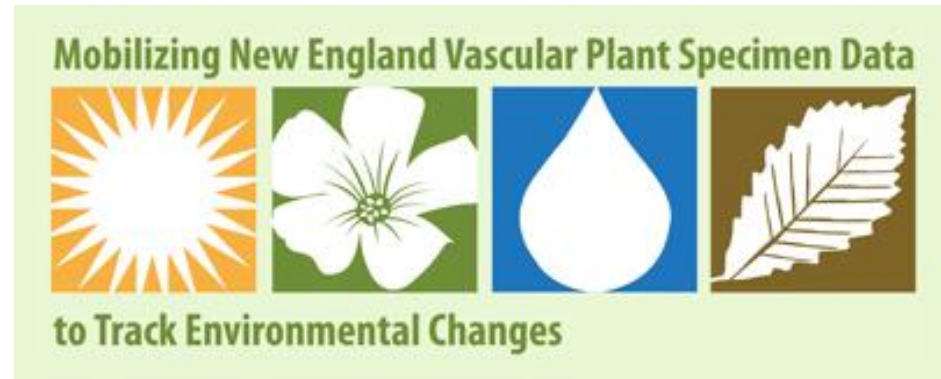- CA-FP PEN Proposal

Taxonomic Extent

- 22 target families
  - Oldest records
  - Most diverse families
  - Most endemic and threatened families
- 250 additional NPN taxa

58%

Native species

67%

Endemic species

Mobilizing New England Vascular Plant Specimen Data

to Track Environmental Changes

USA npn
National Phenology Network

Key Achievement: The CCH2 Portal

2.2 million records

215,388 images

1.4 million georeferenced

- ✓ BLM Arcata Field Office Herbarium (BLMAR) more info...
- ✓ BLM Herbarium - Redding FO (BLM-RD) more info...
- ✓ Blodgett Forest Research Station (BFRS) more info...
- ✓ Cal State LA Herbarium (CSLA) more info...
- ✓ California Academy of Sciences (CAS-BOT-BC) more in
- ✓ California Department of Food and Agriculture (CDA)
- ✓ California State University San Bernardino (CSUSB) r
- ✓ California State University, Long Beach Herbarium (L
- ✓ California State University, Northridge (SFV) more info...
- ✓ California State University, Sacramento (SACT) more in
- ✓ Carl W. Sharsmith Herbarium, San Jose State Univers
- ✓ Catalina Island Conservancy Herbarium (CATA) more in
- ✓ Clifton Smith Herbarium, Santa Barbara Botanic Gard
- ✓ Colorado Desert District, California Department of Pa
- ✓ CSU Chico – Chico State Herbarium - Vascular Plants
- ✓ CSU Stanislaus Herbarium (SHTC) more info...
- ✓ Fresno State Herbarium (FSC) more info...
- ✓ Hopland Research and Extension Center (HREC) more i
- ✓ Humboldt State University Vascular Plant Herbarium (H
- ✓ Huntington Botanical Gardens Herbarium (HNT) more inf
- ✓ Jasper Ridge Biological Preserve, Stanford University (
- ✓ Joshua Tree National Park (JOTR) more info...
- ✓ Kenneth S. Norris Center for Natural History (UCSC) mo

- ✓ Klamath National Forest Herbarium (KNFY) more info...
- ✓ MacFadden Herbarium, Department of Biological Science, California State Univers
- ✓ Mendocino College Coast Center Herbarium (MCCC) more info...
- ✓ Pacific Grove Museum of Natural History (PGM) more info...
- ✓ Pasadena City College Herbarium (PASA) more info...
- ✓ Rancho Santa Ana Botanic Garden Herbarium (RSA) more info...
- ✓ Riverside Metropolitan Museum, Clark Herbarium (CLARK) more info...
- ✓ Robert F. Hoover Herbarium, Cal Poly State University (OBI) more info...
- ✓ San Diego State University Herbarium (SDSU) more info...
- ✓ SD Herbarium, San Diego Natural History Museum (SD) more info...
- ✓ Sierra Pacific Industries-Forestry (SPIF) more info...
- ✓ Sweeney Granite Mountains Desert Research Center (GMDRC) more info...
- ✓ UC Davis Herbarium (DAV) more info...
- ✓ University and Jepson Herbaria, University of California, Berkeley (UCJEPS) more i
- ✓ University Herbarium, Epling Collection, University of California, Berkeley (UCJEP
- ✓ University of California Santa Barbara Herbarium (UCSB) more info...
- ✓ University of California, Irvine Herbarium (IRVC) more info...
- ✓ University of California, Los Angeles Herbarium (LA) more info...
- ✓ University of California, Riverside Herbarium - Vascular Plants (UCR) more info...
- ✓ Vascular Plants of the Harry D. Thiers Herbarium at San Francisco State Universit
- ✓ Victor Valley College (VVC) more info...
- ✓ Yosemite National Park (YM-YOSE) more info...

Original CAP Institution

Non-CAP institution with data in CCH2 portal

45 Institutions in CCH2

Community collaboration

Key Achievement: Dark data brought to light

7 newly public collections (3 funded, 4 unfunded)

7 newly public datasets (non-California records)
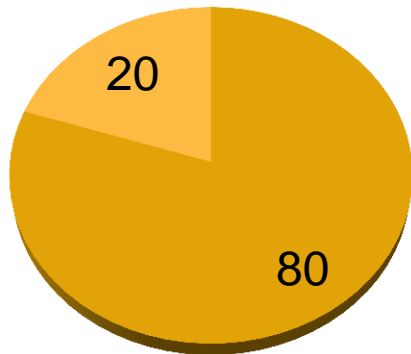
➡️ **~78,500** newly public specimen records

before funded digitization!

904,200 + 78,500 = 982,700

Key Achievement: Diverse participation

Year 1 Participation

Female
Male

50 50

Non-underrepresented group
Underrepresented group

20

80
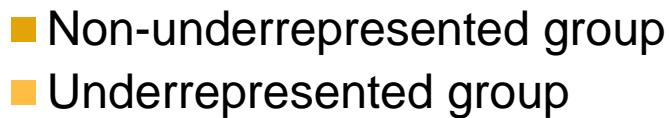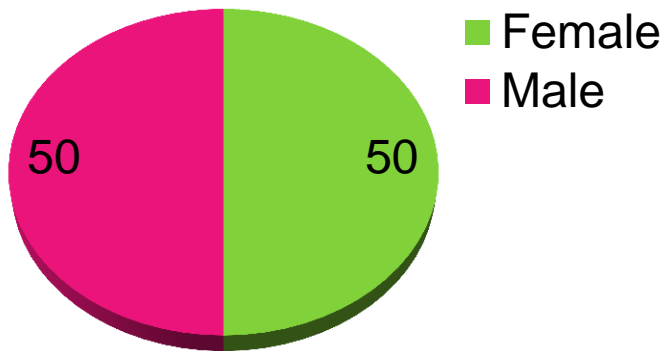
- 43 undergraduates received course credit
- Supported
  - 91 undergraduates
  - 6 graduate students
  - 30 curatorial staff
- 22 faculty
- 198 volunteers
- 93 online participants
- 50 herbarium tours
- 16 news articles

www.capturingcaliforniasflowers.org
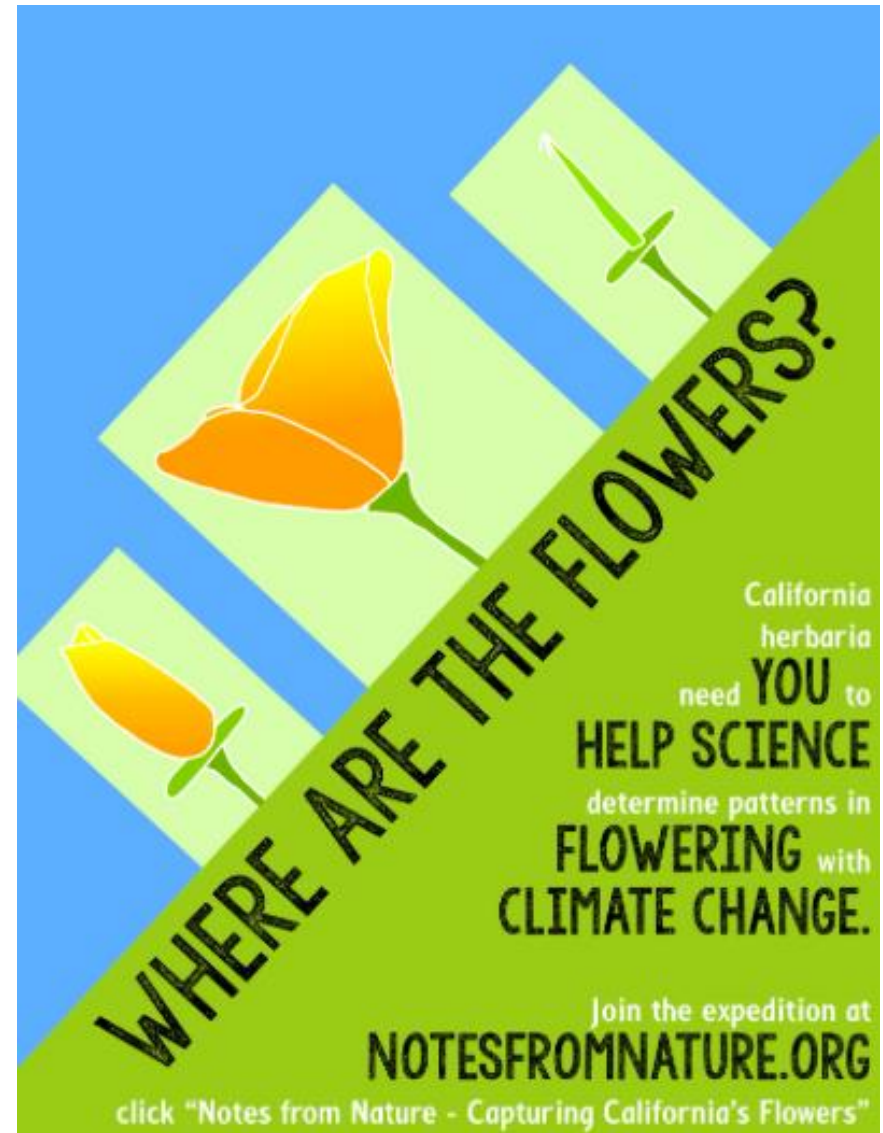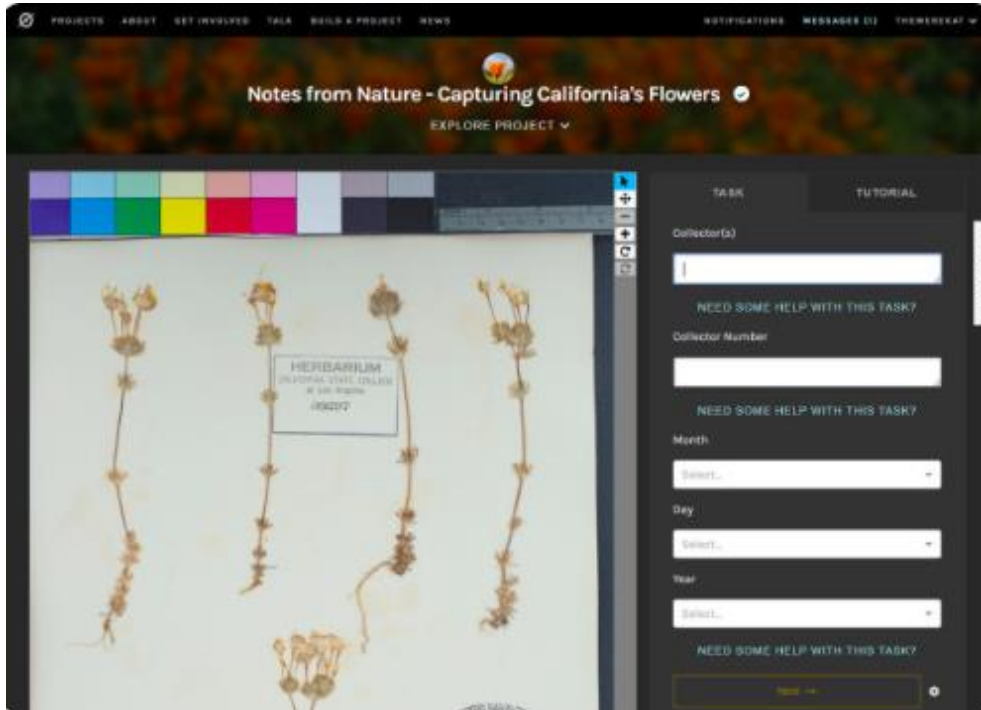
Home   About   Resources   Education & Outreach   News   Portal

CALIFORNIA PHENOLOGY

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Notes from Nature

New tools for new data
Scoring images for traits

New tools for new data
Searching label text for traits

Harvesting Filter

Occurrence trait: [Phenology (ver 1.0) ▼]
Verbatim text source: [Reproductive Condition ▼]
Filter by text (optional): [flower]
Filter by taxon (optional): [   ]   [Get Field Values]

Reproductive Condition

Select Source Field Value(s) - hold down control or shift buttons to select more
than one value

flowers & fruit - [124]

○ Reproductive ▶
○ Sterile
○ Not scorable
Notes: [   ]

Status: [----------------- ▼]
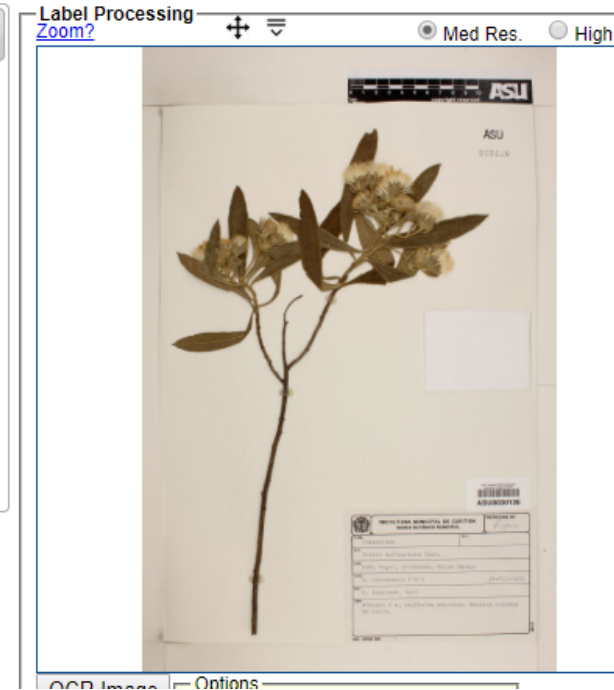
[Batch Assign State(s)]

New tools for new data
New traits tab in Symbiota

Robert F. Hoover Herbarium, Cal Poly State University (OBI)

| Occurrence Data | Determination History | Images | Linked Resources | Admin |

Label Processing
Zoom?

Collector Info   <<

| Catalog Number ? | Other Cat. #s ? | Collector ? | Number ? | Date ? |
| OBI139178 | 5584 | Sharon Jochums | 247 | 1974-05-19 |

[Dupes?]
☐ Auto search

Associated Collectors ?

Verbatim Date ?
19-May-74

Latest Identification

Scientific Name ?   Author ?
Abronia latifolia   Eschsch.

ID Qualifier ?   Family ? Nyctaginaceae

Identified By ?   Date Identified ?

Locality

| Country ? | State/Province ? | County ? | Municipality ? |
| United States | California | San Luis Obispo | |

Locality ?
Dunes at Piedras Blancas

Security: Security not applied ▼ ?   ☐ Deactivate Locality Lookup

Latitude	Longitude	Uncertainty ?		Datum ?	Verbatim Coordinates ?
			🌐 C F		
				<<	

| Elevation in Meters ? | Verbatim Elevation ? | Depth in Meters ? | Verbatim Depth ? |
| - << | | - | |

Phenology

○ Reproductive
○ Sterile
○ Not scorable

Coming soon!
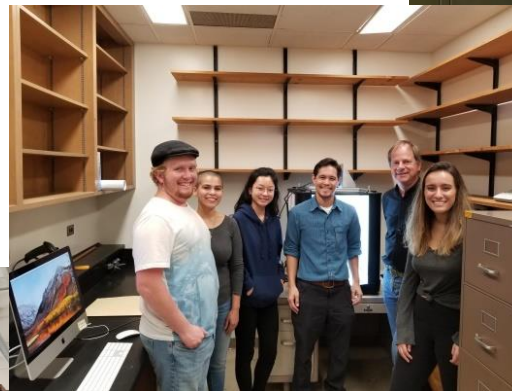
[OCR Image]

Options
☐ OCR whole ima
☐ OCR w/ analysi

Phenological Data Standards: CURRENT SOLUTION

- Data publishing and export
  - eMOF DwC-A extension
  - JSON string in dynamicProperties
  - Individual record display in the occurrence form
 - Matrix table export format – from Symbiota

Lesson Learned

- Site visits!

Lesson Learned

- Site visits:
  - Sets a deadline for preparation
  - Opens line of communication
  - Allows face-to-face interaction
  - Deepens understanding of unique situations of institutions
- Recommendations:
  - Most productive when equipment and students/volunteers are ready
  - Allow time for (lots of) equipment error
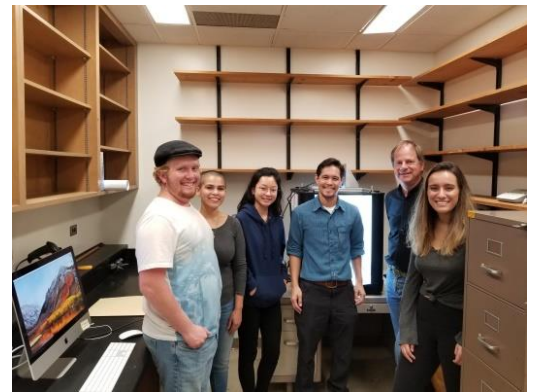
CAP TCN: Project Team

Katie Pearson

Project manager

Cal Poly

Jason Alexander

Data manager

UC Berkeley

Ed Gilbert

Symbiota
developer

Jenn Yost

Lead PI
Cal Poly

Year 2: Here we come!

capturingcaliforniasflowers.org; cch2.org

@CalPhenologyTCN

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Katie Pearson: kdpearso@calpoly.edu

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