California Phenology (CAP TCN): Starting Year 4: Thinking about sustainability

Capturing California’s flowers: Using digital images to investigate phenological change in a biodiversity hotspot
Building a record of flowering time

**Goal:**
904,200 specimens

- 780,000 Imaged
- 1.1 million transcribed
- 1.4 million scored for phenology
- 500,000 new georeferences

**Workflow**

- Ortery
- Photosimile
- Lightbox
- Adobe Lightroom
- Barcode specimens → Image specimens → Refile → Edit/convert images → Upload JPEGs to CyVerse → Link CyVerse images to CCH2 → Score phenology → Transcribe data → Geo-reference → Specimens w/o data in database → Specimens w/ data in database → Update catalog numbers → Symbiota In CCH2 portal

**Recommendations:**
- In-person trainings
- Regular check-ups
- Open communication about troubleshooting
- Order early!
Progress and Tracking

Figure 3. Site traffic (in number of sessions) of the CCH2 data portal since the start in year 1 through now (September 2018 to July 2021). The number of site visits has steadily increased (Google Analytics).

The power of a portal in a virtual world

Welcome to the Consortium of California Herbaria Portal (CCH2)

CCH2 serves data from specimens housed in CCH member herbaria. The data included in this database represents all specimen records from partner institutions. The data served through this portal are currently growing due to the work of the California Phenology Thematic Collections Network (CAP-TCN). This collaboration of 22 California universities, research stations, natural history collections, and botanical gardens aims to capture images, label data, and phenological (i.e., flowering time) data from nearly 1 million herbarium specimens by 2022. Data contained in the CCH2 portal will continue to grow even after this time through the activities of the CCH member institutions.

For more information about the California Phenology TCN, visit the project website:

https://www.capturingcaliforniastflowers.org

For more information about the California Consortium of Herbaria (CCH) see:

http://ucjeps.berkeley.edu/consortium/about.html

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Special thanks to the National Park Service who provided funds for the initial setup of the CCH2 website and database (November 2016).
Forming a Community around the portal

- Set up your super administrators spread out across major collections
- Make sure the supported collections are in the core team
- Give editing access to everyone who should have it
- Allows collections to help each other when things need fixing
- More eyes on the data
- Digitization can happen from afar

Connecting Regional Experts to the Portal

- 100 club - georefs
- Expert botanists
- Retired naturalists
- Community building
- Regular work session - zoom
- Ca Native Plant Society
Leveraging TCN Support: the Consortium

Established monthly zoom meetings
• Rare species redactions, if any
• Collections in danger of fire
• Image storage solutions
• New proposals

Create long lasting training materials
Georeferencing in CCH2 Training Course

How to use this course

The purpose of this course is to provide a modular learning resource for georeferencing in the herbarium data portal, CCH2. Each module consists of learning objectives, a training video, and a quick quiz.

Module 1: What is georeferencing?

Learning objectives

Upon completion of this module, you should be able to:

- Understand the basic practice of georeferencing and why it is important.
- Define the terms: occurrence, locality, uncertainty/error, geodetic datum.
- Identify different types of coordinate systems you may encounter when georeferencing U.S. specimen records, including decimal degrees, degrees, minutes, seconds; UTM; and township, range, section.

www.capturingcaliforniasflowers.org

CALIFORNIA PHENOLOGY NETWORK

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Upcoming event:

DO YOU DIG PLANTS?
Integrate digitization into the curriculum

• Digitization Zoom Course
  • Taught by the project manager Katie Pearson
  • Students from 10 different schools meet at the same time
  • Students get credit - BIO 200/300/400 from home school
  • 1 instructor, big impact

Integrate digitization into the curriculum

• Phenology research course
  • Students ask a question about a climate variable and flowering time
  • Create data annotations
  • Download data
  • Analyze the results in a pre-made R script
  • Present a paper or poster
• Full course is published on our website and QUBES: https://qubeshub.org/publications/1956/1
• New 3 hr lab posted
  • https://qubeshub.org/publications/2476/1

Developing Standards
• Establish the framework for which trait-based data can be shared via Darwin Core Archives
Phenological Data Standards

• Convened a task group within Specimens & Observations - Quintin Groom
• Have a charter
• Our team: James Macklin, Ramona Walls, Gil Nelson, Kathy Gerst, Liz Matthews, Ed Gilbert, Rob Guralnick, John Wieczorek, Patrick Sweeney, Brian Stucky, Libby Ellwood, Deb Paul, Stan Blum

SYMBIOTA Trait SCORING Tools

• Trait mining from verbatim text
• Trait coding from images
• 1.4 million scored
• By one person
• Went collection by collection searching same words
• 30-40 hours total
How to use these data now:

To join specimen data with trait data:

https://www.capturingcaliforniasflowers.org/phenology.html#Output

Huge Thank You to the team

- Project manager: Katie Pearson, Cal Poly
- Data manager: Jason Alexander, UC Berkeley
- Ed Gilbert, ASU Symbiota Hub
- iDigBio and the ADBC Program at NSF
Year 4: Here we come!
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