

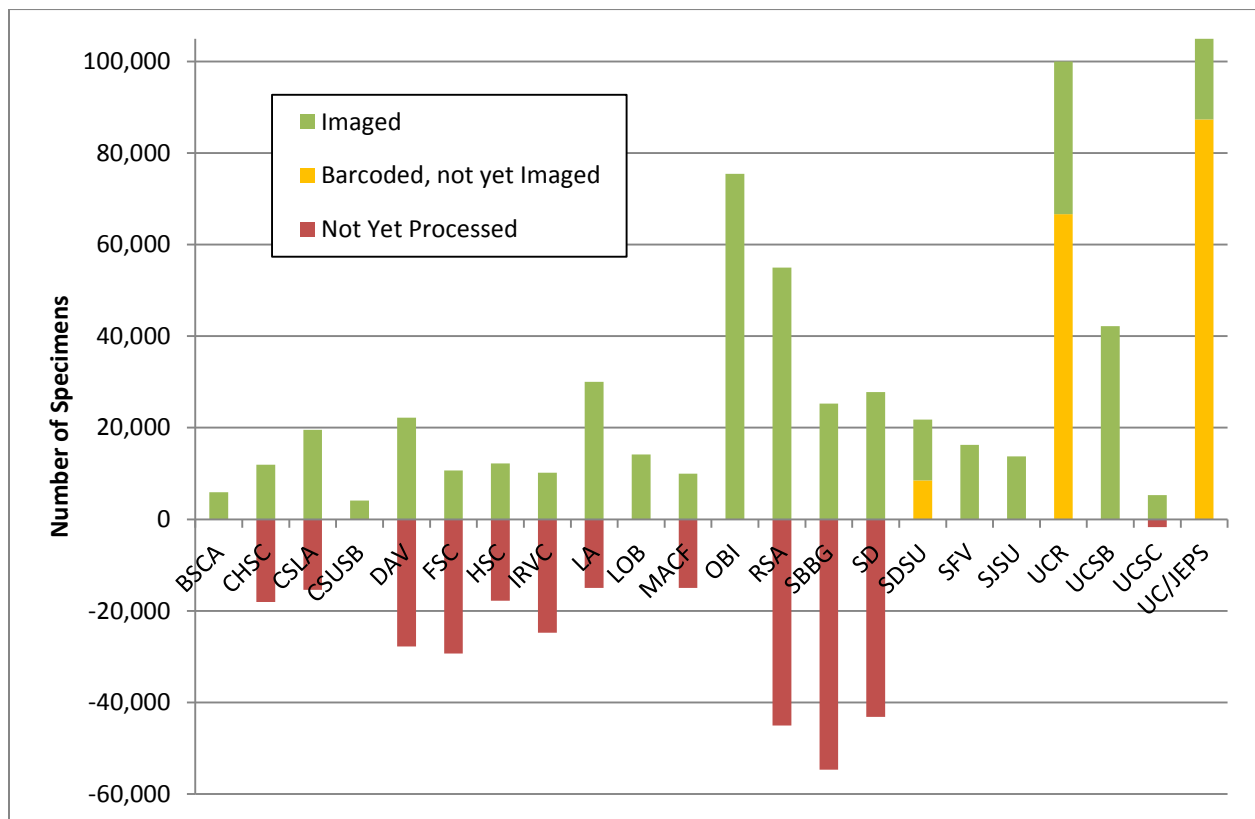
# CALIFORNIA PHENOLOGY TCN – QUARTERLY REPORT – FEBRUARY 2020

Assembled by Katie Pearson, February 4, 2020

## PROGRESS IN DIGITIZATION EFFORTS:

### IMAGING

All institutions are continuing to image specimens or have achieved their imaging goals and have moved on to image processing, transcription, and/or georeferencing. Figure 1 shows the distribution of unprocessed, barcoded/processed, and imaged target specimens per institution as of February 3, 2020.



**Figure 1.** Digitization progress, in terms of number of specimens imaged, barcoded, or not yet processed. Bars above the zero line indicate specimens that have been processed in preparation for imaging or have been imaged. The green portions of these bars represent the number of specimens that have been imaged. Red bars below the zero line indicate the number of target specimens (i.e., specimens to be imaged as part of the CAP TCN) that have not yet been pre-processed or imaged.

---

## TRANSCRIPTION

An estimated 30,000 specimen records have been transcribed across the CAP Network since July 2019. This is approximately one tenth of the goal number of transcriptions to be produced by this project.

Three Notes from Nature expeditions are currently live, representing specimens from four institutions (CSLA, FSC, IRVC, and LOB). These expeditions are 50% complete, representing 8,367 classifications (transcriptions) and resulting in 1,108 fully transcribed specimen records to date (each specimen must be transcribed three times to be considered “complete”).

---

## GEOREFERENCING

Since July 2019, 33,721 specimen records from CAP institutions have been georeferenced in CCH2. This is approximately one tenth of the goal number of georeferences to be produced by this project.

---

## PHENOLOGICAL SCORING

Phenological scoring tools from images and text fields are now live in the CCH2 data portal but have not yet been implemented by CAP collaborators. Trial scoring at Cal Poly has resulted in phenological scores for 731 specimens.

## SHARE AND IDENTIFY BEST PRACTICES AND STANDARDS (INCLUDING LESSONS LEARNED)

Phenological scoring tools from images and text fields are now live in the CCH2 data portal. Protocols for using these tools are available on the project website:

<https://www.capturingcaliforniasflowers.org/documents.html>. A new “Phenological Scoring” page is being developed to describe the phenological scoring schema, provide phenology-related protocols, and act as a repository for taxon-specific training materials as they are developed (<https://www.capturingcaliforniasflowers.org/phenology.html>).

Now that the phenological scoring tools are developed, we are creating a plan for scoring the intended >900,000 herbarium specimens. We plan to first prioritize California taxa that are easy to score for phenology and are well-represented in collections (e.g., *Eschscholzia*, *Lupinus*). Then we will move to less numerous taxa and taxa that will require more complicated training resources. The lead-PI, the PM, PI Susan Mazer, and graduate students Natalie Love and Tadeo Ramirez Parada are developing training materials for phenological scoring of specific taxa.

The PM led a pilot georeferencing training session for Cal Poly hired undergraduates. The questions that emerged from the training will help shape future georeferencing training efforts. Weekly georeferencing sessions are held at Cal Poly.

## IDENTIFY GAPS IN DIGITIZATION AREAS AND TECHNOLOGY

Many CCH2 users, including CAP institutions, have indicated desire for new functionalities in CCH2, such as enabling searches by California Native Plant Society inventory ranking and native/non-native status. These requests, as well as bugs and problems, are now being tabulated and tracked in two GitHub repositories, the Wish List (<https://github.com/CCH2-portal/CCH2-wish-list>) and the Problems (<https://github.com/CCH2-portal/CCH2-problems>) repositories.

Currently, we have no solution for publishing data from “snapshot” institutions in CCH2 to GBIF. This is because not all snapshot institutions provide GUIDs for their records.

## SHARE AND IDENTIFY OPPORTUNITIES TO ENHANCE TRAINING EFFORTS

Check-in calls with all institutions were held in November 2019. Year-end progress reports were issued to all CAP institutions in December 2019, which alerted some institutions to their need to accelerate digitization. The PM followed up with institutions that had questions about their progress or wanted to schedule trainings. An all-CAP conference call to discuss progress, updates, and the phenological scoring and georeferencing tools is scheduled for February 7<sup>th</sup>, 2020.

The PM visited CAP institutions during the month of January to provide training and troubleshooting help. Chico State (CHSC) had experienced significant delays in imaging and was experiencing a bottleneck in image processing. After the Northern California Botanists Symposium, where the PM gave a lightning talk, the PM spent a day with the CHSC PI and staff to help overcome these issues.

On a separate trip, the PM visited the herbaria at UCLA, Cal State LA, and UC Irvine, providing training in data entry, general use of the CCH2 data portal, image processing, and imaging, as needed.

The PM is working with PI Mare Nazaire (RSA) on a georeferencing training webinar on February 26<sup>th</sup>.

## SHARE AND IDENTIFY COLLABORATIONS WITH OTHER TCNS, INSTITUTIONS, AND ORGANIZATIONS

A workshop submitted to the Ecological Society of America meeting was not accepted; however, the PM will present a lightning talk at an ESA INSPIRE session at the ESA 2020 meetings.

Presentations about the CAP Network and community engagement were given to two separate chapters of the California Native Plant Society.

In mid-December, Faerthen Felix and Erica Krimmel brought the entire Sagehen Creek Field Station (SCFS) herbarium collection to Cal Poly. After establishing a workflow and receiving training, Felix and Krimmel used the Cal Poly digitization equipment to image all the specimens in three days (December 16-18), resulting in 1,069 specimen images that were immediately processed and made accessible online via CCH2. SCFS now manages their data live in CCH2.

## SHARE AND IDENTIFY OPPORTUNITIES AND STRATEGIES FOR SUSTAINABILITY:

Following the sudden power outage at UF, the CCH2 data portal was transferred to servers at Arizona State University, which has considerable cyberinfrastructure that indicates future sustainability.

## SHARE AND IDENTIFY EDUCATION AND OUTREACH (E&O) ACTIVITIES:

An announcement article about the CAP TCN was published in the peer-reviewed journal *Madroño* <https://doi.org/10.3120/0024-9637-66.4.130>.

The PM shares updates on the project and phenology-related news via the network Twitter account (@CalPhenologyTCN).

Five blog posts were written and published to the CAP website:

<https://www.capturingcaliforniasflowers.org/blog-recap>.

The PM and Cal Poly herbarium students led a workshop prior to the monthly meeting of the San Luis Obispo chapter of the California Native Plant Society on November 7<sup>th</sup>, 2020. The PM gave a short presentation on the project and Notes from Nature, and participants practiced using Notes from Nature to transcribe specimen labels.

The PM attended the Northern California Botanists Symposium January 13-14, 2020 and presented a lightning talk about using Notes from Nature to help California herbaria. The lightning talk was recorded and posted on the CNPS YouTube channel: <https://www.youtube.com/watch?v=AQv3EXy03r8> (starting at 25:32). The PM also presented this talk to the executive board of the Mt. Lassen Chapter of the California Native Plant Society on January 15<sup>th</sup>. A higher quality version of this lightning talk will be recorded and posted on the CAP TCN YouTube channel in the near future.

As part of the training trip to UC Irvine, the PM also co-led a class of approximately 30 introductory biology students. Rebecca Crowe (collections manager at UC Irvine) and the PM introduced the students to herbarium curation, specimen-based research, and specimen digitization. The PM then trained half of the students in using Notes from Nature to transcribe label data, and Crowe trained the other half in pre-curation steps including barcoding.

The PM and lead-PI Jenn Yost, along with PI Katja Seltmann and graduate students Natalie Love and Tadeo Ramirez Parada at UC Santa Barbara, are developing a Course-based Undergraduate Research Experience curriculum that teaches students to use data from CCH2 to examine plant phenological responses to climate. Currently, the course is being iteratively developed with the help of four advanced undergraduate students. We aim to produce robust documentation such that the course could be easily adopted and run at other universities and colleges. Once final drafts are available, the course materials will be posted on the CAP website. A pilot session of the course will run in its entirety at Cal Poly during the spring quarter.