



CCGP Newsletter

Issue #14 - November 29, 2023

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CCGP landscape genomics team releases ALGATR

The CCGP landscape genomics team showcases their novel R package, A Landscape Genomics Analysis Toolkit in R (*ALGATR*), in a recently published article in *Molecular Ecology*! The paper titled "[Individual-based landscape genomics for conservation:](#)

[An analysis pipeline](#)" highlights the benefits of individual-based sampling for conservation and explains how landscape genomic methods, paired with individual-based sampling, can answer fundamental conservation questions.

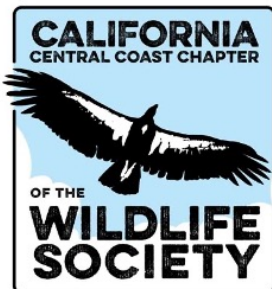
Led by our intrepid CCGP postdoc Anne Chambers, the authors present *ALGATR* - a user-friendly, open-source workflow, curated with key landscape genomic methods - with the primary goal of making landscape genomic approaches more accessible and explicitly applicable to conservation biology.

[Click here to find CCGP analyses tools on our website](#)

New Point Conception Institute for conservation research



The Nature Conservancy recently announced their new Point Conception Institute (PCI), located at the [Jack and Laura Dangermond Preserve](#). The PCI aims to promote collaboration, technological innovation, and data science among environmental scientists and research partners to enhance ecosystem resilience in the face of climate change. The Point Conception region is a biologically diverse habitat where northern and southern California ecosystems meet, with the result that genomic differentiation and species' range limits often occur in the region. This unique landscape configuration, in both terrestrial and marine realms, makes it an ideal location for the 'living laboratory' as conceptualized by the PCI. The often-contrasting climatic regimes north and south of Point Conception provide great opportunities for research on the capacity of wildlife and natural systems to adapt to climate change, sea level rise, and other environmental variations and challenges. The research at the institute will emphasize open science and interdisciplinary cooperation to address conservation challenges and highlight the value of nature. Further, the PCI collaborates with leading science and technology institutions, with ongoing projects such as sharing ecological data, using a mobile marine monitoring radar system, and deploying real-time sensors for environmental monitoring. To read more, you can find [the full article](#) on the Nature Conservancy Newsroom.



Erin Toffelmier gives keynote talk at Annual Wildlife Symposium

CCGP's Associate Director, Erin Toffelmier, gave the keynote talk at the recent [Annual Wildlife Symposium](#) of the Central Coast Chapter of The Wildlife Society in San Luis Obispo, CA. The talk, titled "Broad-scale landscape genomics to inform conservation actions in California," provided a great opportunity to share the ongoing efforts of the

CCGP, gain feedback, and inspire discussion on strategies to incorporate

genomics into conservation management. As part of this presentation, Erin distributed a survey to get direct feedback on how California's planners and land managers may apply conservation genomics to their work, including what genetic metrics, synthetic analyses, and tools are of greatest interest. We are really excited by the responses and look forward to further discussions!

Brad Shaffer at Biodiversity Genomics Europe



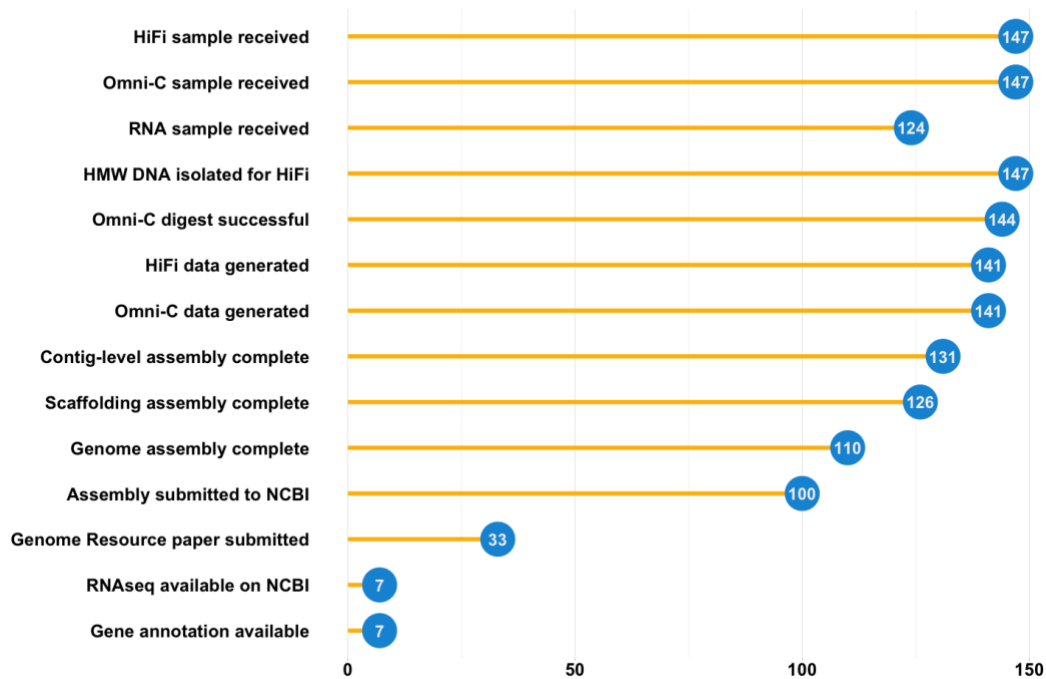
As mentioned in our ninth issue, CCGP PI and Director, Brad Shaffer, [joined the External Expert Advisory Board](#) (EEAB) of [the Biodiversity Genomics Europe \(BGE\) Project](#). As a member, his duties primarily entail providing advice and guidance on assessing the project's performance and informing decisions on matters relating to his expertise and experience gained from the CCGP. To carry out these duties, Brad attended the BGE's [1st All Hands Meeting last week in Barcelona](#). He participated in panel discussions on progress of the BGE, strategies for bringing their results to policy-makers across the EU, and shared lessons learned from the CCGP for rapid and accurate reference genome assembly. The BGE is assembling de novo reference genomes and using DNA barcoding to look at patterns of presence/absence of several hundred species across Europe, establishing a foundation for future work at the population and landscape genetic levels to inform conservation actions. The permitting challenges facing the international movement of samples was humbling, but it was great to be able to share our experience with colleagues across the EU!



CCGP winners in AGA photo contest

We are happy to share that the CCGP was well represented in the recent American Genetic Association (AGA) inaugural photo contest! CCGP PI Greg Grether won second place (a \$150 prize) with a fantastic photo of an American Rubyspot Damselfly (*Hetaerina americana*)! CCGP PI Dan Wright also received an honorable mention with his stellar shot of a Woolly Sculpin (*Clinocottus analis*). It is always exciting when biologists get to see their study species in the wild, and this contest was a great opportunity to showcase these organisms. Congrats to Greg, Dan, and the rest of the winners!

Reference genome and WGS progress



Number of Species Completed (as of Nov. 29, 2023)

We have crossed another milestone for reference genome progress with the recent completion of **all the HiFi sequencing data by the UC Davis team!** A massive thank you to Ruta, Mohan, Oahn, and Noravit for all of their hard work in getting the tissue samples for nearly 150 CCGP species extracted and sequenced! We would also like to thank the team at PacBio for their guidance and support with sequencing technicalities on the [PacBio SMRT cells](#). The UC Santa Cruz team are also nearly wrapping up all of the Omni-C sequencing! With all of this data in the queue, Merly has completed 110 genomes with the latest being two of our favorite iconic California plant species: our state flower, the California Poppy (*Eschscholzia californica*) and the California Sycamore (*Platanus racemosa*).

CCGP PIs have published over 30 Genome Resource articles in the Journal of Heredity. The most recent include [the reference genome of the bicolored carpenter ant, *Camponotus vicinus*](#) and [a highly contiguous genome assembly for the pocket mouse *Perognathus longimembris longimembris*](#), with many more in progress.

At the other end of the pipeline, our bioinformatics team has been hard at work with processing WGS sequencing data and wrangling metadata. They have pushed over 30 CCGP projects through the entire pipeline to [generate variant calling data](#), mapping whole genome resequencing data against the available

reference genomes. 18 projects have data in our quality check stage and about another 20 projects have data nearly ready to enter the queue. We're about 20% of the way through this phase of the project and already starting to see some interesting patterns of genomic variation across the California landscape. We're looking forward to receiving and analyzing the rest of the resequencing data!

Lastly, as we near the end of the year, the CCGP would like to wish everyone a happy holiday season!

Have anything to share?

As always, if your lab has any interesting information to share or you come across something that may be of interest to the CCGP community, please don't hesitate to let us know. [Click here to get in touch!](#)

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California Conservation Genomics Project

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