

# An Introduction to Aquatic Insects: Basic Taxonomy, Ecology, and Use in Assessing Freshwater Environments



This course is designed to give a very general overview of Order Level taxonomy for freshwater aquatic insects, and the use of these critters in assessing the health of aquatic ecosystems. It is geared toward individuals with a basic knowledge of science and interest in freshwater aquatic environments such as rivers, streams, and lakes. The goal is for the attendee to understand how and why these organisms are important for healthy watersheds, and for them to come away with a basic knowledge of the different types of aquatic insects and how to tell them apart.

**Presenter:** [Dan Pickard](#), Taxonomist

Dan Pickard is an Aquatic Invertebrate Taxonomist with the Aquatic Bioassessment Laboratory (ABL) located at California State University, Chico. He is broadly trained in general North American freshwater invertebrate identification, with 28 years of experience. The ABL is responsible for processing benthic macroinvertebrate (BMI) samples from the State's SWAMP (Surface Water Ambient Monitoring Programs) statewide and regional sampling programs. Dan has worked on BMI identifications from across all of California since joining the ABL in 2000. He manages ABL sample sorting and BMI taxonomy operations. He has also been a member of SAFIT (Southwestern Association of Freshwater Invertebrate Taxonomists) since its inception.

**Webinar Sponsor:** Southwest Association of Freshwater Invertebrate Taxonomists

<https://www.safit.org/>

**Webinar Organizer:** Clean Water Team (SWRCB)

[https://www.waterboards.ca.gov/water\\_issues/programs/swamp/clean\\_water\\_team/](https://www.waterboards.ca.gov/water_issues/programs/swamp/clean_water_team/)

**When:** March 30, 2023 11:30am – 12:20pm (Pacific Time)

**How to Participate:** Microsoft Teams meeting

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**Please let me know about future taxonomy and bioassessment workshops and webinars:**

The Clean Water Team and SAFIT will be offering in-person workshops and training events on aquatic invertebrate taxonomy and bioassessment. If you would like to be notified about these, please fill out this Google form - [https://docs.google.com/forms/d/e/1FAIpQLSdj5Wx-fPDnsD-t19cFZ6TQUNYZ25xy7twqmru\\_7ZswySqOUA/viewform](https://docs.google.com/forms/d/e/1FAIpQLSdj5Wx-fPDnsD-t19cFZ6TQUNYZ25xy7twqmru_7ZswySqOUA/viewform)

**Resources:**

- Material for Citizen Monitors, Community Science, and STEM can be found in the **Clean Water Team's Guidance Compendium for Watershed Monitoring and Assessment** [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/clean\\_water\\_team/guidance.html#30](https://www.waterboards.ca.gov/water_issues/programs/swamp/clean_water_team/guidance.html#30)

**Examples from Section 3.5 Biological Communities Indicators**

- CA Benthic Macro Invertebrate Digital Reference Collection (Interactive PDF) [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351e\\_bugstogo0414.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351e_bugstogo0414.pdf)
- What Good is a Mayfly? / Para que' sirve frigonea? [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351g.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351g.pdf)
- Relative Sizes of Benthic Macroinvertebrates [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351h.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351h.pdf)  
Tamaños Relativos de Macroinvertebrados Bentónicos [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351h\\_esp.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351h_esp.pdf)
- Stream Insects and Crustaceans [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351i.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351i.pdf)  
Insectos y Crustáceos Acuáticos [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/351i\\_esp.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351i_esp.pdf)
- A Bioassessment Primer [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/352.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/352.pdf)

- What are Bioassessments?  
[https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/352a.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/352a.pdf)

**Video:**

- Fresh Waters Flowing - Biological Integrity <https://www.videoproject.org/Fresh-Waters-Flowing-Biological-Monitoring-Protocol.html>
- Bugs of the Underworld: The Natural History of Aquatic Insects <https://www.flyfisherman.com/editorial/bugs-of-the-underworld/470288>
- Bioassessments of Freshwater Communities (Playlist) <https://www.youtube.com/playlist?list=PLMSa5d-ill6NeH8c0SfIYvxpOxhBNM4pS>
- Bio-Monitoring of Freshwater Flora and Fauna (Playlist) <https://www.youtube.com/playlist?list=PLvTjRb8VCkp74yuTcPMcyT640TxYDzD7b>

**Additional Resources:**

- California Aquatic Bioassessment Workgroup  
[https://www.waterboards.ca.gov/water\\_issues/programs/swamp/bioassessment/cabw.html](https://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/cabw.html)
  - 2022 California Aquatic Bioassessment Workgroup & California SFS Meetings (Playlist) <https://www.youtube.com/playlist?list=PLsvwKXxrgufr2VjyPSKTt2VjogWa1Wg4>
- Chico Aquatic Bioassessment Lab (ABL) <https://www.csuchico.edu/cwe/research/abl.shtml>
- National Aquatic Resource Surveys - Indicators: Benthic Macroinvertebrates <https://www.epa.gov/national-aquatic-resource-surveys/indicators-benthic-macroinvertebrates>
- OSPR Laboratory Programs' Aquatic Bioassessment Laboratory <https://wildlife.ca.gov/OSPR/Science/Aquatic-Bioassessment-Lab>
- Scientific Collecting Permits (CDFW) <https://wildlife.ca.gov/Licensing/Scientific-Collecting>
- SCCWRP – Bioassessment <https://www.sccwrp.org/about/research-areas/bioassessment/>
- SWAMP (Surface Water Ambient Monitoring Program)- Bioassessment [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/bioassessment/](https://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/)
- SWAMP IQ (Information and Quality Assurance Program) - Bioassessment [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/swamp\\_iq/bioassessment.html](https://www.waterboards.ca.gov/water_issues/programs/swamp/swamp_iq/bioassessment.html)

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[www.waterboards.ca.gov/water\\_issues/programs/swamp/cwt\\_volunteer.html](http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_volunteer.html) E-mail Subscription

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[www.waterboards.ca.gov/resources/email\\_subscriptions/swrcb\\_subscribe.html](http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.html)

