

Mindi Summers, Ph.D.
Associate Professor (Teaching)

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Education

Scripps Institution of Oceanography – University of California, San Diego	M.S. 2011; Ph.D. 2014
Stanford University	B.S. with honors 2009

Professional Experience

Associate Professor (Teaching), Department of Biological Sciences – University of Calgary	2021 – present
Assistant Professor (Teaching), Department of Biological Sciences – University of Calgary	2016 – 2021
Postdoctoral Research Associate, Ecology & Evolution Education – University of Maine	2014 – 2016

Honours & Awards

Killam Undergraduate Mentorship Award	2022
University of Calgary Internationalization Award – Early Career	2022
University of Calgary Teaching Award, Experiential Learning	2021
University of Calgary Student Union Teaching Excellence Award	2021
University of Calgary Sustainability Team Teaching Award	2021
University of Calgary Sustainability Staff Research Award	2021
Faculty of Science Excellence Award, Scholarship Excellence – Early Career	2021
Faculty of Science Excellence Award, Teaching Excellence – Early Career	2020

Educational Leadership Highlights

Educational Leader in Residence, Taylor Institute of Teaching & Learning – University of Calgary	2023 – present
University of Calgary Conjoint Faculties Research Ethics Board Vice Chair	2022 – present
Department of Biological Sciences Curriculum Review Chair	2022 – present
Council of Undergraduate Research, Biology Division Elected Councillor	2022 – present
Department of Biological Sciences Instructors' Mentoring Group Creator & Facilitator	2020 – present
Department of Biological Sciences Concentrations Working Group Co-Chair	2019 – 2022

Community Outreach Leadership Highlights

University of Calgary Bee Campus Designation, Community Science, and Outreach	2019 – present
Biological Sciences Biodiversity Collections Website & Online Resources	2017 – present
'Name A Species Contest' With Birch Aquarium	2011
CalEchoes Cruise: K-12 Collaborative Resources and Live-Chat, Chief Scientist	2009-2010

Teaching & Course Coordination

University of Calgary Course Instructor & Coordinator – teaching team lead (2-4 GTAs; course technician)			
ZOOL 375/401	Introduction to Invertebrate Zoology	2017-2023	7 offerings
BIOL 401	Evolutionary Biology	2016-2023	8 offerings
ZOOL 567	Animal Behaviour	2019-2022	2 offerings
BIOL 520	Tropical Biodiversity & Conservation (<i>Group Studies in Belize</i>)	2022	1 offering

ZOOL 435	Entomology	2020	1 offering
MRSC 572	Marine Invertebrate Zoology (<i>Bamfield Marine Science Centre</i>)	2019	1 offering
ZOOL 475/576	The Invertebrates	2017-2018	2 offerings

Research Leadership

Funding Source	Project Title	Role	Funding	Duration
SSHRC partnership development grant	Canadian Consortium of Science Equity Scholars	Co-applicant	\$198,527	2022 – 2025
University of Calgary teaching & learning development grant	Developing infrastructure for student-led 3D digitization of zoological specimens to advance student learning and research opportunities	Principal Investigator	\$10,000	2021 – 2023
City of Calgary urban alliance contract	Native bee biodiversity and their floral relations	Principal Investigator	\$30,406	2020 – 2021
University of Calgary teaching & learning SoTL grant	Advancing creativity in postsecondary STEM contexts	Co-principal Investigator	\$40,000	2019 – 2021
Alberta Advanced Education i@home international education and intergovernmental coordination grant	Pan-Pacific project: collaborative DNA barcoding and analysis	Co-principal Investigator	\$6,000	2019 – 2020
University of Calgary teaching & learning SoTL grant	Engaging students in authentic research in Biological Sciences through the use of collaborative course-based undergraduate research experiences (CUREs)	Co-principal Investigator	\$40,000	2018 – 2021
Andrew W. Mellon Foundation internal subgrant competition	Making specialized natural history collections accessible to diverse users: a case study involving the bees of Alberta	Principal Investigator	\$40,000	2018 – 2019
University of Calgary teaching & learning SoTL grant	Investigating the role of drawing as a learning tool and scientific practice in undergraduate zoology	Principal Investigator	\$18,495	2017 – 2019
Maine Research Reinvestment Fund Seed Grant	Workforce development: helping UMaine faculty develop classroom activities that prepare students for skills needed in Maine's science careers	Co-applicant	\$67,704	2016 – 2017
<i>University of California</i> Student Ship Funds	Exploring California's ecological changes and historical origins	Principle Investigator/Chief Scientist	~\$200,000	2009 – 2010

Mentorship & Training

Role	Role*	Number	Duration
Graduate students	Teaching assistants	30	2017 – present
	Research assistants	5	2019
	Research coaches	3	2020 – present
	Sessional instructor	1	2022

	Instructional designers	6	2018 – present
	Committee member	13	2015 – present
Undergraduate students	1 term researchers	22	2011 – present
	2 term researchers	25	2012 – present
	Research assistants	16	2017 – present
	Peer mentors	17	2016 – present
New faculty		2	2020 – present
Postdoctoral fellows		2	2018 – present

Peer Reviewed Publications (20 total) (*mentees indicated by an underline and asterisk)

- Phillips L*, Duclos K*, & **Summers MM**. 2022. Animal behaviour case study lessons in communication, migration, and parental care using the jigsaw approach. *CourseSource*.
<https://qubeshub.org/community/groups/coursesource/publications?id=3421&v=1>
- Armbrecht L, Eisenhofer R, Utge J, Sibert EC, Rocha F, Ward R, Pierella Karlusich J J, Tirichine L, Norris R, **Summers M**, & Bowler C. 2021. Paleo-diatom composition from Santa Barbara Basin deep-sea sediments: A comparison of 18S-V9 and diat-rbcl metabarcoding vs shotgun metagenomics. *ISME Communications*, 1(1), 66.
<https://doi.org/10.1038/s43705-021-00070-8>
- Altiner D, Payne JL, Lehrmann DJ, Özkan-Altiner S, Kelly BM, **Summers MM**, & Yu M. 2021. Triassic foraminifera from the Great Bank of Guizhou, Nanpanjiang Basin, south China: taxonomic account, biostratigraphy, and implications for recovery from end-Permian mass extinction. *Journal of Paleontology*. <https://www.doi.org/10.1017/jpa.2021.10>
- Branchaw JL, Pape-Lindstrom PA, Tanner KD, Bissonnette SA, Cary TL, Couch BA, Crowe AJ, Knight JK, Semsar K, Smith JI, Smith MK, **Summers MM**, Wienhold CJ, Wright CD, & Brownell SE. 2020. Resources for teaching assessing the *Vision and Change* biology core concepts. *CBE-Life Sciences*. 19(2). <https://doi.org/10.1187/cbe.19-11-0243>
- McKay DM, **Summers M**, Buret AG, Emmett T, & Gilleard JS. 2019. Rethinking graduate education in parasitology: a case study. *Trends in Parasitology*. 35(9): 665-668. <https://doi.org/10.1016/j.pt.2019.05.001>
- Smith MK, Holmes NG, Walsh CW, & **Summers MM**. 2019. Using EcoEvo-MAPS to assess student thinking across the Four Dimensional Ecology Education (4DEE) framework. *Ecosphere*. 10(9). <https://doi.org/10.1002/ecs2.2873>
- Smith MK, Brownell SE, Crowe AJ, Holmes NG, Knight JK, Semsar K, **Summers MM**, Walsh CW, Wright CD, & Couch BA. 2019. Tools for change: Measuring student conceptual understanding across undergraduate biology programs using Bio-MAPS assessments. *JMBE*. 20(2). <https://doi.org/10.1128/jmbe.v20i2.1787>
- Couch BA, Wright CD, Freeman S, Knight JK, Semsar K, Smith MK, **Summers MM**, Zheng Y, Crowe AJ, & Brownell SE. 2019. GenBio-MAPS: A programmatic assessment to measure students understanding of *Vision and Change* core concepts across general biology programs. *CBE-Life Sciences*. 18: 1-14. <https://doi.org/10.1187/cbe.18-07-0117>
- Semsar K, Brownell S, Couch B, Crowe A, Freeman S, Smith M, **Summers M**, Wright C, & Knight J. 2019. Phys-MAPS: A programmatic physiology assessment for introductory and advanced undergraduates. *Advances in Physiology Education*. 43: 15-27. <https://doi.org/10.1152/advan.00128.2018>
- Summers MM**, Couch B, Knight J, Brownell S, Crowe A, Semsar K, Wright C, & Smith MK. 2018. EcoEvo-MAPS: a tool to assess student learning in ecology and evolution through the undergraduate major. *CBE-Life Sciences Education*. 17: 1-12. *LSE Issue Highlighted Article*. <https://doi.org/10.1187/cbe.17-02-0037>
- Smith MK, Toth ES, Borges K, Dastoor F, Johnston J, Jones EH, Nelson PR, Page J, Pelletreau K, Prentiss N, Roe JL, Staples J, **Summers M**, Trenckmann E*, & Vinson E. 2018. Using place-based economically relevant organisms to improve student understanding of the roles of carbon dioxide, sunlight, and nutrients in photosynthetic organisms. *CourseSource*. <https://www.coursesource.org/courses/using-place-based-economically-relevant-organisms-to-improve-student-understanding-of-the>
- Trenckmann E*, Smith MK, Pelletreau KN, & **Summers MM**. 2017. An active-learning lesson that targets student understanding of population growth in ecology. *CourseSource*. <https://www.coursesource.org/courses/an-active-learning-lesson-that-targets-student-understanding-of-population-growth-in-ecology>
- Summers MM**, Messing CG, & Rouse GW. 2017. The genera and species of Comatulidae (Comatulida: Crinoidea): taxonomic revisions and a molecular and morphological guide. *Zootaxa*. 4268: 151-190.
<https://doi.org/10.11646/zootaxa.4268.2.1>
- Rouse GW, Lanterbecq D, **Summers MM**, & Eeckhaut I. 2016. Four new species of *Mesomyzostoma* (Myzostomida, Annelida). *Journal of Natural History*. 50: 1-23. <https://doi.org/10.1080/00222933.2015.1056266>

- Summers MM**, Pleijel F, & Rouse GW. 2015. Whale falls, multiple colonisations of the deep, and the phylogeny of Hesionidae (Annelida). *Invertebrate Systematics*. 29: 105-123. <https://doi.org/10.1071/IS14055>
- Summers MM** & Rouse GW. 2014. Phylogeny of Myzostomida (Annelida) and their relationships with echinoderm hosts. *BMC Evolutionary Biology*. 14: 170. <https://doi.org/10.1186/s12862-014-0170-7>
- Summers MM**, Messing CG, & Rouse GW. 2014. Phylogeny of Comatulidae (Echinodermata: Crinoidea: Comatulida). *Molecular Phylogenetics & Evolution*. 80: 319-339. <https://doi.org/10.1016/j.ympev.2014.06.030>
- Summers MM**, Al-Hakim I, & Rouse GW. 2014. Turbo-taxonomy: 21 new species of Myzostomida (Annelida). *Zootaxa*. 3873: 301-344. <http://dx.doi.org/10.11646/zootaxa.3873.4.1>
- Summers MM**, Katz S, Allen EE, & Rouse GW. 2013. Association of rhizobia with a marine polychaete. *Environmental Microbiology Reports*. 5: 492-498. <https://doi.org/10.1111/1758-2229.12043>
- Payne JL, **Summers M**, Rego BL, Altiner D, Wei J, Yu M, & Lehrmann DJ. 2011. Early and Middle Triassic trends in diversity, evenness, and size of foraminifers on a carbonate platform in south China: implications for tempo and mode of biotic recovery from the end-Permian mass extinction. *Paleobiology*. 37: 409-425. <https://doi.org/10.1666/08082.1>

Teaching & Scholarship Guides (3 total) (*mentees indicated by an underline and asterisk)

- Aparicio-Ting F, Arcellana-Panlilio M, Bensler H, Brown B, Clancy TL, Dyjur P, Radford S, Redwood C, Roberts V, Sabbaghan S, Schroeder M, **Summers MM**, Tézli A, Wilks L, & Wright AC. 2023. Fostering student success in online courses (M Arcellana-Panlilio, P Dyjur & AC Wright, Eds.). University of Calgary, Taylor Institute for Teaching and Learning Guide Series, University of Calgary. <https://taylorinstitute.ucalgary.ca/resources/fostering-student-success-guide>
- Flanagan K, Braun R, Cantin A, Loy K, & **Summers, M**. 2022. *A Guide for Undergraduate Research at UCalgary*. University of Calgary, Taylor Institute for Teaching and Learning Guide Series. <https://taylorinstitute.ucalgary.ca/resources/a-guide-for-undergraduate-research-at-ucalgary>
- Morden N* & **Summers MM**. 2020. Planning a SoTL lesson study: 4-part series. Taylor Institute for Teaching & Learning Resource Library, University of Calgary. <https://taylorinstitute.ucalgary.ca/resources/three-steps-to-planning-a-sotl-lesson-study>

Reports (3 total) (*mentees indicated by an underline and asterisk)

- Summers M**, Bickley E*, Cobos K*, Gillis E*, Glessing R*, Hay J8, Maggipinto H*, Neame T*, Nwankwo O, Pauls E*, Stelmack Y*, Sutherland A*, Wright J*, Zhao E*, & Clarke, A. (2022). University of Calgary - Zoology 435 Insect Survey Report – Fall 2022. <http://hdl.handle.net/1880/115590>
- Summers M**, Best L, Seal M*, Vermaak S*, Robinson S, Gavin M, Clarke A, Purvis E*, & Miksha R.* 2021. The native bee fauna and its floral relations in The City of Calgary, Alberta. <https://prism.ucalgary.ca/handle/1880/114223>
- Summers M**, Best L, Robinson S, Seal M*, Purvis E*, Vermaak S*, Clarke A, Gavin M, Miksha R*, & Eggermont M. (2021). Calgary—A bee city. <https://doi.org/10.11575/PRISM/39480>
- Summers M**, Clarke, A., Abid, M., Aguilar, A., Akhter, B., Archibald, C., Arfeen, N., Asim, A., Auja, K., Baek, D., Bhatia, A., Brothers, P., Chughtai, T., Cobos Rodriguez, K., De Jesus, J., Dornstauder, K., Duclos, K., Elkhair, Z., Ellis, R., ... Zhao, Z. Y.* (2021). University of Calgary - Zoology 435 Insect Survey Report. <http://dx.doi.org/10.11575/PRISM/38858>

Open Education Resources (10 total) (*mentees indicated by an underline and asterisk)

- Seal M*, Duclos K*, Carson A, & **Summers M**. 2022. Visual Glossary of Insect Morphology. <http://hdl.handle.net/1880/115592>
- Gee G*, & **Summers M**. 2022. Orthoptera of Alberta: Visual Guide to Common Terrestrial Families (Adults). <http://hdl.handle.net/1880/115623>
- Seal M*, & **Summers M**. 2022. Pollinating Insects of Alberta: Visual Guide to Common Terrestrial Orders (Adults). <http://hdl.handle.net/1880/115621>
- Gee G*, & **Summers M**. 2022. Insects of Alberta - Visual Guide to Terrestrial Orders Adults. <http://hdl.handle.net/1880/115620>
- Carson A, Gee G*, & **Summers M**. 2022. Coleoptera of Alberta: Visual Guide to Common Terrestrial Families (Adults). <http://hdl.handle.net/1880/115603>
- Carson A, & **Summers M**. 2022. Hemiptera of Alberta: Visual Guide to Common Terrestrial Families (Adults). <http://hdl.handle.net/1880/115624>
- Neame T*, Ritchie S, & **Summers MM**. 2021. Bumble bees of Calgary: A key and illustrated guide.

<http://dx.doi.org/10.11575/PRISM/38932>. Downloaded >1500 times in first week.

Chughtai T* & **Summers MM**. 2021. Accidental Entomophagy: Eating Bugs!

<https://biodiversity.ucalgary.ca/resource/accidental-entomophagy-eating-bugs/>

Truzhnikova D* & **Summers MM**. 2020. University of Calgary Storm Pond Freshwater Invertebrate Key.

<http://hdl.handle.net/1880/115591>

Summers M, Kerstiens H*, Alexander R, Barry T*, Hailey B*, Kaing E*, Galpern P. 2019. Wild bees of Alberta poster.

<http://hdl.handle.net/1880/115430>

Selected Education Workshops Designed and Delivered (10 total)

Course-based undergraduate research experiences (CURE): From blue sky planning to backyard investigations. *University of Calgary Teaching Days*. Co-presenters: K. Loy & K. Flanagan. One offering: **2021**.

Ethical considerations when working with humans and human data. *Workshop prepared for Department of Biological Sciences Diversity, Equity, & Inclusion Committee*. One offering: 2021.

Engaging and interacting with learners: motivation, inclusivity, and students as partners. *SAGES (SCIE 601: "Theory and Practice of University Teaching and Learning in STEM") workshop*. Three offerings: **2017, 2018, 2019**.

Teaching techniques: promoting student discussion and question generation. *Field Trips Program Professional Development Series, Bamfield Marine Science Centre*. One offering: **2019**.

Classroom & laboratory observation protocols for undergraduate STEM (COPUS & LOPUS) training. University of Calgary Faculty of Science Workshop. Co-presenter: A. Cantin. One offering: **2019**.

Data analysis for educational research. *Research Methodologies Community of Practice*. One offering: **2018**.

Bio-MAPS: Programmatic assessment to guide curricular transformation. *Departmental seminar and professional development workshop, University of Maryland*. Co-presenter: B Couch (University of Nebraska). One offering: **2018**.

Scientific teaching: an introduction to backwards design, active learning, and assessment. *Seminar and professional development workshop, Connecticut Community Colleges; Seminar for 5th Annual Host-Parasite Interactions (HPI) Bootcamp, University of Calgary Faculty of Veterinary Sciences*. Two offerings: **2016; 2017**.

Education at sea: using CalEchoes cruise educational materials to bring research into the classroom. Professional development seminar for Birch Aquarium staff and volunteers.

Selected Invited Seminars (19 total) (*mentees indicated by an underline and asterisk)

Summers MM. 2022. Engaging students as scientists: Designing community-based research and experiential learning in biology. Maine Center for Research in STEM Education (RISE Center) Colloquia & Seminar Series.

Panelist – Community-Engaged Learning in the Faculty of Science and Cumming School of Medicine: A Roundtable Panel. 2022. University of Calgary.

Clitheroe H, Harris L, Packer C, Shen H, **Summers M**, & Vamosi J. 2022. Embedding international experiences - going places without leaving your classroom. Science Teaching Forum, University of Calgary.

Cantin A, Flanagan K, Loy K, & **Summers M**. 2021. Using blue sky thinking to engage students in course-based undergraduate research experiences (CUREs). Science Teaching Forum, University of Calgary.

Summers M. 2021. Engaging zoology students in undergraduate research and community-based experiential learning. Science Teaching Forum, University of Calgary.

Cuthbertson J & **Summers MM**. 2021. Advancing Creativity in Postsecondary STEM contexts. Science Teaching Forum, University of Calgary.

Summers MM. 2020. i@Home collaborative student research: exploring local seafood through DNA barcoding. Forum on Internationalization at Home in Science Education, online.

Fernandes J*, Handy-Hart CJ*, Kulle S*, & **Summers MM**. 2020. Transitioning from students to instructional designers: benefits of a three-year student-faculty collaboration to promote creativity. Creativity Community of Practice Brown Bag Series, University of Calgary.

Fernandes J* & **Summers MM**. 2020. Igniting student curiosity, inquiry, and creativity in zoology. Creativity Community of Practice Brown Bag Series, University of Calgary.

Summers MM. 2018. New tools for assessing conceptual understanding and motivation throughout a biology major. Departmental seminar, University of Middle Tennessee.

Summers MM & Theodor JM. 2018. Drawing to learn in biology: development of attitudinal assessment tool. Research Methodologies Community of Practice Series, University of Calgary.

Summers MM. 2015. How students think about ecology and evolution: identifying concepts that students master and persistently struggle with as first-year and graduating biology majors. Maine Center for Research in STEM Education Center colloquia, University of Maine.

Selected Recent Conference Presentations (32 total) (*mentees indicated by an underline and asterisk)

- Summers M** & Flanagan K. 2022. Getting started with a question: Using the question formulation technique in biology. Undergraduate Biology Educators of Alberta Annual Meeting. *Oral presentation*. Online.
- Summers M**, Alexander R, Demarse A*, Eggermont M, Galpern P, Hurrell C, Kaing E*, McLernon D*, Ranjit K, Theodor J, & Vamosi J. 2021. A collaboration in creating digital natural history collections: A case study of Alberta native bees. The Entomological Society of Alberta Annual Meeting. *Oral presentation*. Online.
<https://prism.ucalgary.ca/handle/1880/114075>
- Neame T*, Ritchie S, and **Summers M**. 2021. Bumble bees of Calgary: A key and illustrated guide for identification of the bumble bee species found in Calgary, Alberta. The Entomological Society of Alberta Annual Meeting. *Poster presentation*. Online.
- Vermaak SK*, Seal M*, Ford-Sahibzada TD*, and **Summers M**. 2021. Insect Pollinator Diversity and Native Plant Associations in the City of Calgary, Alberta. The Entomological Society of Alberta Annual Meeting. *Poster presentation*. Online.
- Ruddock K, **Summers M**, & Vamosi J. 2021. Creating digital collections of biological specimens: Lessons for teaching and learning. Digital Pedagogy Institute. *Oral presentation*. Online. <https://prism.ucalgary.ca/handle/1880/113727>
- Summers MM** & Flanagan K. 2021. Who's living in my community? Community-engaged undergraduate research investigating local insect biodiversity. Undergraduate Biology Educators of Alberta Annual Meeting. *Oral presentation*. Online.
- Fernandes J*, Handy-Hart CJ*, Kulle S*, & **Summers MM**. 2021. A student-faculty collaboration to promote student creativity in zoology. University of Calgary Conference on Postsecondary Teaching & Learning. *Poster presentation*. Online. **Awarded best poster**.
- Adams J, Cuthbertson J, Jalilehvand F, **Summers M**, Turner K, Kelly R, Paton C. 2021. Mentorship through shared experiences in a community of practice. University of Calgary Conference on Postsecondary Teaching & Learning. *45-minute session*. Online
- Fernandes J*, Handy-Hart CJ*, Kulle S*, & **Summers MM**. 2020. A student-faculty collaboration to promote student creativity in zoology. SABER Society for the Advancement of Biology Education Research Annual Conference. *Poster presentation*. Online.
- Ashbaugh A*, Cantin A*, **Summers MM**, & Flanagan K. 2020. Students' gain in research skills across four course-based undergraduate research experiences (CUREs). SABER Society for the Advancement of Biology Education Research Annual Conference. *Poster presentation*. Online.
- Summers MM**, Walsh C, Holmes NG, & Smith MK. 2019. EcoEvo-MAPS: An ecology and evolution assessment tool that targets student thinking across the major. Canadian Society for Ecology and Evolution Annual Conference. *Short talk oral presentation*. Fredericton, New Brunswick.
- Summers MM**, Morden N*, Ashbaugh A*, Seggie, SS*, & Theodor JM. 2018. Drawing and visualization in biology: professional practice and active-learning technique. Society for the Advancement of Biology Education Research Annual Conference. *Round table discussion*. University of Minnesota, USA.
- Morden N*, Seggie, SS*, Theodor JM, & **Summers MM**. 2018. Asking students to draw in biology: a lesson-study of student attitudes and values in visual learning. Society for the Advancement of Biology Education Research Annual Conference. *Poster presentation*. University of Minnesota, USA.
- Summers MM**, Morden N*, Ashbaugh A*, & Theodor JM. 2018. Drawing-to-learn in biology: an active learning strategy and professional practice. Alberta Introductory Biology Association Annual Conference. *Oral presentation*. University of Calgary, Alberta.
- Ashbaugh A*, Morden N*, Theodor JM, & **Summers MM**. 2018. Assessing student motivation: a new tool to infer attitudes on visual learning. University of Calgary Conference on Postsecondary Learning and Teaching. *Poster presentation*. University of Calgary, Alberta.
- Morden N*, Ashbaugh A*, Theodor JM, & **Summers MM**. 2018. Drawing "octopines": student-led redesign of a lecture and lab. University of Calgary Conference on Postsecondary Learning and Teaching. *Poster presentation*. University of Calgary, Alberta.

- Hassell A*, Harrison E*, Swann J, & Summers M. 2018. Are benthic macroinvertebrates the true kings and queens in the Castle? Prairie University Biology Symposium. *Poster presentation*. University of Calgary, Alberta.
- Summers MM, Ashbaugh A*, Morden N*, & Theodor JM. 2017. Drawing as a learning tool in zoology. International Society for the Scholarship of Teaching and Learning Annual Conference. *Poster presentation*. Calgary, Alberta.
- Summers MM & Smith MK. 2016. Navigating from Vision & Change: the development of an ecology and evolution assessment that measures student learning across the major. Society for the Advancement of Biology Education Research Annual Conference. *Oral presentation*. University of Minnesota, USA.
- Summers MM & Smith MK. 2015. Navigating from Vision & Change: the development of an ecology and evolution assessment that measures student learning across the major. Ecological Society of America Annual Conference. *Oral presentation*. Baltimore, USA.
- Summers MM, Brownell SE, Couch BA, Crowe AJ, Freeman S, Knight JK, Semsar K, Wright C, & Smith MK. 2015. Bio-Maps: A suite of program-level assessment tools to measure student learning across the biology major. Gordon Conference: Undergraduate Biology Education Research. *Poster presentation*. Bates College, USA.

Course Design & Innovation

Course-based research experiences (CUREs) with community and international partners

- Insect biodiversity survey in partnership with City of Calgary (ZOOL435)
- Animal behaviour literature reviews with community partners: Calgary Humane Society, Alberta Institute for Wildlife Conservation, Alberta Farm Animal Care Association (ZOOL567)
- DNA barcoding of local marine invertebrate seafood with international partners (ZOOL401)
- Bio-inspired designed project (ZOOL401; MRSC572)
- Science communication project, disseminated online at biodiversity.ucalgary.ca (ZOOL435)
- Insect biodiversity, DNA barcoding, and specimen digitization team projects; collaboration with Libraries and Cultural Resources (ZOOL576)
- Generation of UofC teaching collection for student work and specimens (ZOOL576; ZOOL435)
- Partnership with the Journal of Undergraduate Research in Alberta to co-host student symposium and publish research abstracts (ZOOL576)
- Member of and received funding through CURE pilot program (2020; 2021) (ZOOL435; ZOOL567)

Active learning teaching approaches

- 206 hours of new lectures with expanded content coverage (BIOL401; MRSC572; ZOOL401; ZOOL576)
- TopHat questions with peer and class discussion for each lecture (BIOL401; MRSC572; ZOOL401; ZOOL576)
- Five case studies using the jigsaw method, covering 16 research studies each (ZOOL401; ZOOL567)
- Minor phyla group presentations (ZOOL401)
- Taxon and paper presentations and discussions (BIOL520)
- Science communication workshop and seminar series (ZOOL435)
- Applied for and received funding to integrate High Impact Practices (2019) (BIOL401; ZOOL567)
- Successful application for active-learning teaching space (2017; 2018) (ZOOL401)

Inquiry-based laboratories, tutorials, and field-experiences

- 27 new three-hour laboratories (ZOOL401; ZOOL435; ZOOL576)
- Over 100 hours of field trips and field experiences (MRSC572; BIOL520)
- Laboratory manual, observational drawing notebook, and marking schemes for 8 labs (ZOOL401)
- Oral group presentations in lab (ZOOL401)
- Development of protocols for students to submit generated DNA barcode data to public Barcode of Life database (BOLD) (ZOOL576; ZOOL401)
- Development of collaboration with Libraries and Cultural Resources to allow students to take high-resolution digital images of their specimens (ZOOL576)
- 4 new tutorials incorporating the programming language R (BIOL401)
- 10 new discussion-based tutorials led by students (BIOL401)

- Preparation of permit applications for scientific collecting and student research (*MRSC572; ZOO435; ZOO567; BIOL520*)
- Animal care protocols (*MRSC572; BIOL520*)
- Repurposing of teaching lab and acquiring new equipment (approximately 1000 hours) (*ZOO576; ZOO435*)

Students-as-partners initiatives

- Peer mentoring program (*ZOO401; BIOL401*)
- Weekly class representative meetings (*BIOL401; MRSC572; ZOO401; ZOO435; ZOO567; ZOO576*)
- Incorporation of pre/post surveys, in-class assessments, and mid-semester feedback (*BIOL401; MRSC572; ZOO401; ZOO435; ZOO567; ZOO576*)
- Book and movie clubs (optional) (*ZOO401; ZOO435*)
- Scaffolded literature review assignment with dissemination options including podcasts, video, blog, written review, or other designs (*ZOO567*)
- Evolutionary topics abstracts (options include written, visual, or audio) (*BIOL401*)
- Evolutionary events infographic reports (*BIOL401*)
- Student-led research proposals (*ZOO567; BIOL520*)
- Project proposal and research manuscript/abstract instructions and marking schemes (*ZOO576; BIOL520*)

Teamwork, metacognition, and reflection

- Critical reflection assignments (*ZOO401; ZOO435; BIOL401; MRSC572; BIOL520*)
- Student portfolios (*ZOO401*)
- Team collaboration materials and activities (e.g., team updates, team contracts) (*ZOO576; ZOO401; BIOL401; MRSC572; BIOL520*)
- Reflective research portfolio assignment (*ZOO576*)

Online and blended learning

- 7 new online modules with recorded lectures and activities (*ZOO435*)
- 10 weekly online reading quizzes and discussion board (*ZOO401*)
- 27 online dissection guides, methodology assignments, and other teaching support materials (*ZOO401; ZOO576*)
- Identification keys and guides for major insect groups (*ZOO435*)
- 2 new tree-thinking guides for student review (*BIOL401*)
- 3 new reading assignments on the popular science book *Beak of the Finch* and three associated primary articles with annotation guidelines (*BIOL401*)
- 3 optional online-lab assignments (*BIOL401*)

Course Innovation Funding - \$36,500

Taylor Institute course-based undergraduate research pilot program (\$22,500)	2020; 2021
Department of Biological Science High Impact Practices Fund (\$12,000)	2019 (2 projects)
University of Maine Faculty Incentive Course Modification Grant (\$2000)	2016

Additional Educational Service & Leadership

University of Calgary Teaching Academy Member & Participant	2021 – present
Department of Biological Sciences Teaching Handbook & Online Resources	2021 – present
Department of Biological Sciences Undergraduate Honours Project Guide	2021 – present
Mentorship of new graduate sessional instructor	2022
Department of Biological Sciences Teaching Mingles Coordinator	2020 – 2021
Faculty of Science Teaching and Learning Journal Club Coordinator	2018 - 2019
Funding: University of Calgary Seeding SoTL (\$800)	
Faculty of Science Internationalizing the Curriculum Reading Group Coordinator	2021
Graduate Micro-credential in Host-Parasite Research Collaborator	2021
UMaine Biology Teaching and Learning Journal Club Coordinator	2014 – 2017

Participation in Communities of Practice	
CURE pilot program	2020; 2021
Faculty of Science Teaching Squares	2020
Education Research Methodologies (15 meetings)	2018
Creativity in STEM community of practice	2017 – 2021

Committee Service

2021-present	University of Calgary Conjoint Faculties Research Ethics Board Member
2020-present	Faculty of Science International Engagement Committee Member
2020-present	Faculty of Science Internship Committee Member
2019-present	Department of Biological Sciences Outreach Committee Member
2018-2021	Faculty of Science Teaching Forum Committee Co-Chair
2017-2019	Department of Biological Sciences Infrastructure, Collections, and Facilities Member
2013	Committee for Annual Faculty Undergraduate Teaching Awards Member
2010-2012	Departmental Student Representative – Scripps Institution of Oceanography Co-Chair

Research Collaborations, Participation, and Service

NASA VINE Education Group (Biomimicry) Collaborator	2022 – present
Canadian Consortium of Equity Scholars	2022 – present
CIHR Health Research Training Platform (\$2.3 million funding) Collaborator	2022 – present
Biology Through Art Collaborator	2022 – present
Host-Parasite Interactions Group – University of Calgary School of Veterinary Medicine	2019 – present

Professional Service

2023	Chair of University of Calgary Teaching & Learning grants adjudication committee
2020-present	Hiring committee member for four tenure-track positions
2020-present	Adjudicator for student research awards
2019	Site-visit for development of partnership with Universidad Autónoma de Baja California Sur
2018-2019	UofC <i>Emerging Leaders Program</i> mentor
2017-present	Scientific journal peer reviewer
2016-present	Letter of recommendation writer (>300)
2015-present	Guest lecturer, panel speaker, and volunteer at events (orientation, K-12 partnerships)

Community Outreach & Service

2022	Wagonstage Theatre partnership: BeeBetrayal summer community theatre performances
2019-2022	Pollinator Week event coordinator: garden celebrations; bee-box building workshops, The City of Calgary engagement booth, visit to local elementary school
2022	University of Calgary Sustainable Landscapes Tour Speaker (Office of Sustainability)
2021	Calgary Chinook Blast: Art & Science Event.
2019	Faculty of Science Take-Over the Calgary Central Library Event: Native Bee Booth.
2014	Guest scientist and lecturer at San Diego Science Fair
2010, 2011	Designed and led full-day educational programs for visitors at the Birch Aquarium
2012-2014	Content developer for Echinoderm Tree of Life website
2011-2014	Science room judge and grader for National Ocean Science Bowl
2010-2014	Tour guide for laboratory, pier, and experimental aquarium
2010-2014	Departmental representative for community outreach events

2010-2014	Visiting classroom scientist to elementary (10+ events) and high school (2+ events)
2013	Upward-Bound science instructor for high school juniors and seniors
2011	Co-taught Expanding Youth Horizons workshop for middle school girls
2006-2008	Tutored high school students in writing at Ravenswood High School
2006-2008	Facilitator of Stanford University “GeoKids” Outreach Program

Selected Public Lectures (12 total) (*mentees indicated by an underline and asterisk)

- Summers M**, Seal M*, Vermaak S*, & Chughtai T*. 2022. What pollinators visit your garden? Bee a community scientist and contribute to the Calgary Pollinator Count. Calgary Horticultural Society April Member’s Talk.
- Summers M**. 2022. Bee A Citizen Scientist: Biodiversity research and the Calgary Pollinator Project. Wildlife Conservation Club Environmental Speakers Series.
- Summers M**. 2021. Partnering with the community. Interdisciplinary Sustainable Agriculture Network Launch - Working Together on Climate Action: What’s Next for Sustainable Agriculture?
- Summers M**, Seal M*, Vermaak S*. 2021. Bee a Citizen Scientist: Native Bee Research and the Calgary Pollinator Project. Alberta Native Bee Council Annual General Meeting.
- Summers M**, Seal M*, Vermaak S*. 2021. Calgary Pollinator Count Q&A. Online Zoom.
- Mosca A & **Summers MM**. 2020. Bee-coming a bee campus webinar. Office of Sustainability, University of Calgary.
- Summers MM**. 2020. From bees to barnacles: design inspired by invertebrates. Biomimicry Alberta Series, Calgary Central Library.
- Alexander A, Eggermont M, & **Summers MM**. 2019. Digitizing Alberta’s native bees. Campus Collisions Series, Taylor Family Digital Library.
- Summers MM**. 2019. Digitizing Alberta’s native bees. Alberta Native Bee Council Seminar, Edmonton.

Media

- Bee Campus, Pollinator Week, Native bee biodiversity: *UToday* (six articles); *CBC* (two articles); *Ask Nature* newsletter; *Calgary Herald*; *Calgary Sun*; *CBC* radio; *Gauntlet*; *YouTube*; *Sustainability Newsletter*; *Global News Live Interview*
- Teaching and student course-based biodiversity research: *UToday* (two articles)
- University of Calgary Teaching & Learning grants: *UToday* (three articles - 2017; 2018; 2019); *Taylor Institute Year Review*
- Papua New Guinea Biodiversity Survey: *National Geographic*
- ‘Name a Species’ Contest: *San Diego Union Tribune*; *CBS-8*; *San Diego News*; *La Jolla Light*; *PhysOrg*
- CalEchoes Cruise: *Scripps Explorations Magazine*; *Fox5 & CBS8* television interviews; *Deep Sea News*

Selected Professional Development

Programs & Courses (13); Workshop Participation (150+ hours); Conference Attendance (21)

2023	Change Management, 6 weeks
2022	<i>Conference on Postsecondary Learning – Moving Forward in a Good Way</i> , 2 days
2022	Skills for Effective Mentoring, 2 weeks, 10 hours
2022	Environmental Stewardship & Sustainability, 10 weeks, 30 hours
2021	The Fundamentals of OCAP, First Nations Governance Centre, 6 hours
2021	Educational Leadership & Mentorship, Staff certificate, 5 days & project, 50 hours
2022	<i>Conference on Postsecondary Learning – Mentorship</i> , 3 days
2020	Teaching Online Program – Special Edition, 3 online modules
2017-2018	Women in SETT Leadership Workshop Series (WINSETT), 6 sessions, 48 hours
2018-2019	Canadian Aquatic Biomonitoring Network Project Manager Training, 6 online modules & 2-day field practicum, 67 hours