SCIENCE-ART SYMBIOSIS WORKBOOK

MEOPAR

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

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Information, Copyright, and Land Acknowledgement

The Science-Art Symbiosis Workbook was created by Samantha Jones, PhD Candidate, Department of Geography, University of Calgary, with the support from Jia Yi Fan, Research Associate — Communities of Practice, and Alexa Goodman, Training Program Manager, as part of the Marine Environmental Observation, Prediction and Response Network (MEOPAR)'s Ocean Decade Community of Practice. It is part of Science-Art Symbiosis, an endorsed Ocean Decade activity, and aligns with the United Nations Decade of Ocean Science for Sustainable Development Challenge 10: Change humanity's relationship with the ocean and Outcome 7: An inspiring and engaging ocean.

This initiative involved national collaboration and we hope that the product will be used by people from across the country and beyond. We would like to acknowledge the many Indigenous Peoples who have been stewards of the land and sea since time immemorial in the place now known as Canada. The intent of this workbook is to invite people to consider how they can approach their work or studies from a different perspective.

We hope that interactions with the content in the pages that follow inspire people to take risks and be bold in contributing to the understanding and care of the oceans, which are important places of livelihood, culture, spirituality, and wonder.

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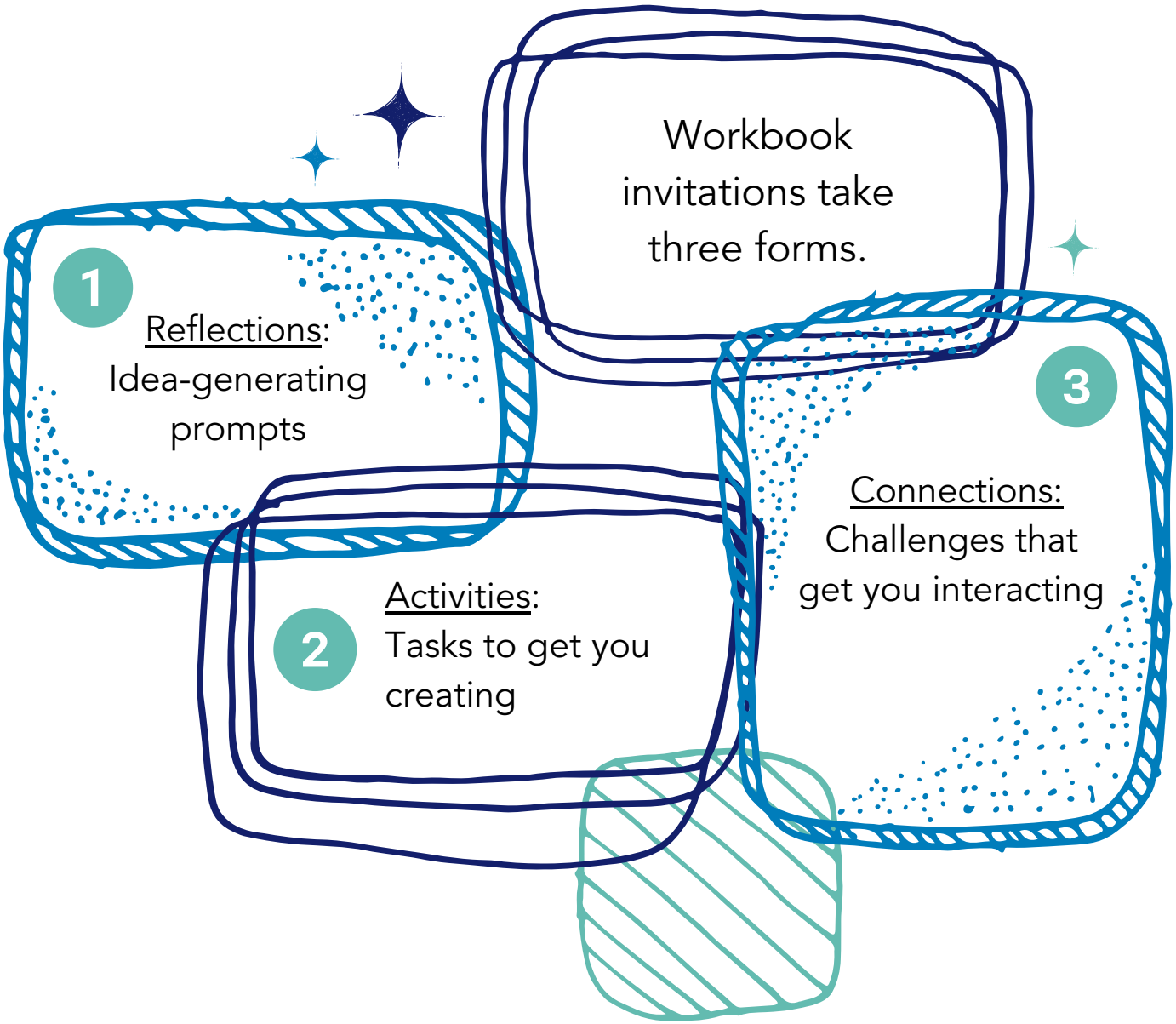
Welcome to the Science-Art Symbiosis Workbook!

We're glad you're here and hope you enjoy the invitations to play contained in these pages.

This workbook is for everyone; there is no experience required and no defined output. The objective is simple—to facilitate an exploration of potential intersections between your research and artistic expression. There is no right way to move through the exercises. You are free to explore and experiment. The word symbiosis is used because we believe you will encounter ways that science and art can work together.



Things to Keep in Mind

While working on the invitations in this workbook and reflecting about your science-art practice going forward, think about how your work impacts your surroundings, and beyond. Consider:

- How will you work safely? Are there regulations you need to follow?
- Will your activities violate your research license?
- How will you work ethically? For example, how will you ask permission or how will you avoid appropriation?
- Do you need access to land or do you need to verify that your activities respect community members?
- Do you need to cite artists or community members?
- Is your work a collaboration or will your project have stakeholders?

This list is intended to get you started and is not comprehensive. Each artist has the responsibility to ensure that they are conducting their practice appropriately for their unique situation.

Activity 1 – Inspiration:

Part 1) Can you think of a science-art or art project related to your discipline that excites you?

If not, spend some time searching for science-art projects related to your field or art that represents a subject or location important to your work. What grabbed your attention or were inspiring? What attributes might you incorporate into your project? Write a list.

Part 2) Rank the attributes from your list generated in Part 1 from most important to you to least important. Keep these attributes in mind when working on other activities in this workbook to help guide your creative process if you get stuck.

Reflection 1 – Creative Products:

What type of creative product would you like to make?

It's okay if you don't know yet.

Ideas:

- film
- vlog
- simulation or model
- data visualization
- collage soundtrack
- soundscape
- remix of sounds
- performance photographs

I would like to...

I think my project would align well with...

Ideas:

- images
- objects
- poetry
- text

I am interested in...

Can you identify some styles or media that would align with your research project?

Reflection 2 – Motivations:

Why are you interested in creating art related to your research?

What do you hope to do with the product you create? Is there a purpose you have in mind? For example, do you want to use it as a communication tool? Or are you interested in incorporating artistic methods into your research?

Is there a specific audience you want to share it with? Consider audience type.

Connection 1 – Memorable Elements:

What components or characteristics stands out about your research?

Ask a collaborator what they think stands out about your research.

Did you pick the same thing? Or did you note different elements? Why do you think that is?

Activity 2 – Shift Emphasis:

Part 1) What creative products are associated with your research? Consider photographs, visualizations, videos, notes, sketches, maps, plots, images, methods, routines, sounds, and more.

Create a list of products that you already have.

Create a list of products that you could collect or generate.
This could be particularly helpful if your research is still in-progress.

Part 2) Create something new by shifting the emphasis.

A) Gather one or more of the products you listed in Part 1.

B) Examine one or more of these products from a different perspective. For example, could you zoom into an atypical subject in a photo? Could you record the sounds of an experimental method in your lab? Could you identify repeated words in your field notes and compile a list?

What jumps out at you when shifting emphasis?

Did you learn something or think about the product in a new way?

Reflection 3 – Use the Senses:

What colours, sights, sounds, textures, tastes, or smells are associated with your work?

Do you use your senses during your research? For example, do you rely on sight for field observations? Do you listen for animal species?

Does one sense dominate the experience?

Do you notice things adjacent to your research with other senses? For example, does an estuary smell different during different seasons?

Is there a way to use more senses during your research?

Activity 3 – Patterns:

Part 1) Describe a pattern associated with your work. This could be a pattern in data, a cycle, the repetition of procedures, lists or protocols, or something else. Identify and list one or more patterns.

Part 2) Can you represent the pattern in a new way? Try to recreate the pattern using a different media. You might experiment with colours, movements, or sounds.

Photo by Kristina Miller

Inspiration: In 2021, PhD Candidate Kristina Miller spent six months at the Kluane Lake Research Station learning about the local watershed. During this time, she created a blanket (left) where each row represents a day during the fieldwork, and the row colour represents the day's average temperature. She gifted the blanket to the Burwash Landing community at the end of the summer. Kristina is a graduate student at the University of Calgary. She is constructing a water and carbon balance for Lhù'ààn Mân' (Kluane Lake) in Yukon Territory. Her PhD project is a result of the community's curiosity about future water availability as it relates to climate change and changing glacier dynamics. (Text modified from description provided by K. Miller)

Connection 2 – Keep Company:

Do you spend time alone or together with others during your research?

How might you represent solitude associated with your work?

How might you represent connections associated with your work?

Describe how you connect with other people, with nature, or with something else.

Challenge yourself to identify how you could use science and art together to deepen a connection.

Activity 4 – Item Inventory:

Focus on items associated with your work.

What type of unique or interesting items are associated with your work? Consider consumables and waste. Think about any equipment you built. Are there opportunities to showcase these creatively?

Note: make sure you understand applicable health, safety, and disposal regulations.

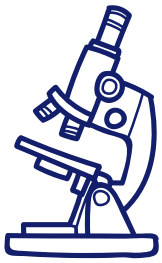
Are there hidden aspects of your work? Could you give a behind-the-scenes look with field footage or showcase any intermediate products you create in your lab or computing workflow?

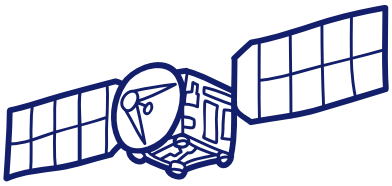
Are there things you notice that are adjacent to, but not directly part of your research? For example, summer solstice lighting in field photographs.

Activity 5 – Play with Scale:

Let's explore scale to unlock creative potential! Does your research use different scales? Consider distance, size, and time, then list and describe how scale relates to your work.

What happens when you consider your work in the context of a different scale? For example, can you zoom in or zoom out? Can you compare your field photos with remote sensing images? Can you consider a different period of time?





How can you play with scale? Brainstorm ideas below.

Reflection 4 – Beautiful Work:

What is something beautiful or attention-grabbing about your work?

Is there something you created or noticed, or a characteristic of your discipline?

Something beautiful is...

Something attention-grabbing is...

Because...

Why do you think it is beautiful or attention-grabbing?

I would tell people...

How would you explain this beauty or importance to someone else?

Activity 6 – Get Emotional:

Part 1) Is there an emotion associated with your work? For example, excitement about working in the field, grief associated with reading about environmental degradation, awe at the beauty of a natural landscape, joy about solving a problem, or something else?

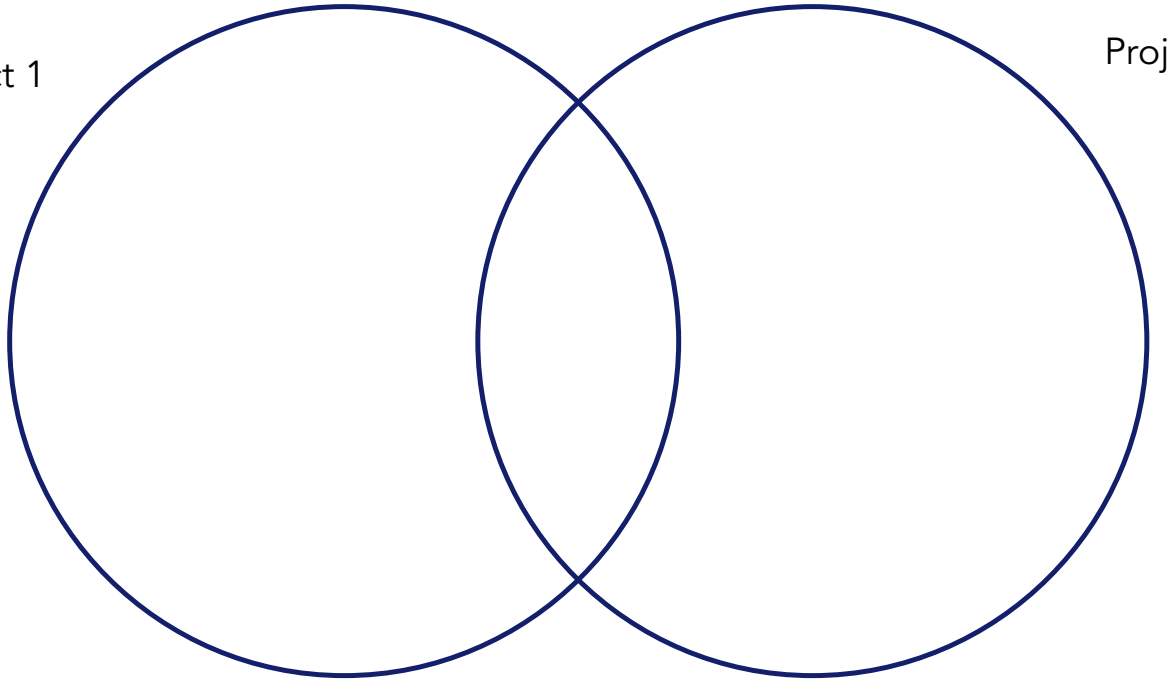
Identify an emotion (or more than one) that you associate with your work.

Part 2) Try to capture this emotion in words by writing a short passage, in an image or plot using creative liberty in data visualization, through speaking or body movement, or something else.

Reflect on how this exercise made you feel. Did it feel natural? Did it make you uncomfortable? Write a few notes about this experience.

Connection 3 – Collaborate:

Does your research share characteristics, items, goals, or other elements with collaborators? Meet with a potential science-art collaborator and list the elements of each individual research project. Identify areas of overlap between projects.



List a few ideas for how you could collaborate on a science-art project related to one or more of the shared elements.

Resources

Materials listed here are only a few suggestions of the many. This list is not an endorsement, rather it includes some starting points for your continued engagement in science-art spaces. All links were live at the time of the Science-Art Workbook publication.

A Selection of Inspiring Projects and People:

An Ecologist Paints a Picture: Hari Sridhar and Manini Bansal in conversation with ecologist and landscape painter Stephen Redpath in Issue 16.1 (March 2022) of Current Conservation. https://www.currentconservation.org/an-ecologist-paints-a-picturein-conversation-with-scientist-turned-landscape-artist-stephen-redpath/

Art Experiences at Ocean Sciences Meeting 2020: Selected projects and works included at the American Geophysical Union (AGU) Ocean Sciences meeting in San Diego, USA, in 2020. https://www.agu.org/Ocean-Sciences-Meeting/Pages/Art-Experiences

Beata Science Art: Fashion and illustrations based in science by molecular biologist, Dr. Beata Mierzwa. https://beatascienceart.com/

Black, Indigenous and other People of Color (BIPOC) Voices: Interview with Christine Liu: Conversation with neuroscience researcher and artist, Christine Liu, featured in the Center for Advancement of Informal Science Education (CAISE) News & Views. https://www.informalscience.org/news-views/black-indigenous-and-other-people-color-bipoc-voices-interview-christine-liu

Collective Listening: CLEAR Soundscapes: Artist Prakash Krishnan facilitated this project with the Civic Laboratory for Environmental Action Research (CLEAR) at Memorial University, NL, to explore relationships to place with soundscapes as part of the lab's artist-in-residence program. https://civiclaboratory.nl/2021/07/27/collective-listening-clear-soundscapes/

Consilience: An online science-poetry and science-art journal that produces peer-reviewed themed issues, for example, bias, entropy, and uncertainty. https://www.consilience-journal.com/

Déversement/FLUX: Work created by Baptiste Grison based on his experience as an artist-in-residence on a MEOPAR and Réseau Québec Maritime research cruise for the Tracer Release Experiment (TReX) project. https://www.baptistegrison.com/deversement

écH2osystème: Maritime acrobatic performance art by Geneviève Dupéré about the St. Lawrence River and the Gulf of St. Lawrence ecosystems and associated challenges. https://ech2osysteme.blogspot.com/

Ocean ArtScience and the Exquisite Corpse Process: A collaborative ocean art project funded by Ocean Networks Canada and supported by the Cobra Collective. https://cobracollective.org/wp-content/uploads/2022/03/OceanArtScience_ExquisiteCorpse_Jung2022.pdf

Ocean Decade Exhibition: Surreal art presented by the Ocean Agency created in response to "the UN's 7 Principles of Ocean Literacy." https://www.theoceanagency.org/exhibition

Ocean Week Canada: Artist Hub: Talks, workshops, and experiences presented by Ocean Week Canada and the Ocean Festival. https://oceanweekcan.ca/artist-hub/

Scientist or artist? How I realized I don't have to choose: Essay by Asma Bashir in Science. https://www.science.org/content/article/scientist-or-artist-how-i-realized-i-don-t-have-choose

Virtual Water Gallery: A Global Water Futures-funded science and art initiative that paired artists and scientists to generate works around water challenges. https://www.virtualwatergallery.ca/

Science Communication and Media Production:

Alan Alda Center for Communicating Science: Science communication professional development, education, and resources based out of Stony Brook University, USA.
https://www.stonybrook.edu/commcms/alda-center/index.php

Arctic PASSION Online Seminar on Storytelling in Science: Storytelling how-to for researchers with with Olivia Rempel. An APECS Webinar.
https://vimeo.com/691337660

Arctic PASSION Online Seminar on Media Production in the Field: Media production how-to for researchers with Olivia Rempel. An APECS Webinar.
https://vimeo.com/692238107

Jackson Wild Media Lab: Fully-funded intensive training opportunity in science filmmaking. https://www.jacksonwild.org/media-lab.html

Inclusive SciComm Symposium: A biennial convention that emphasizes equity and intersectionality. Resources and a selection of speaker videos available on the web. Initiative out of the Metcalf Institute, University of Rhode Island, USA.
https://inclusivescicomm.org/

SciComm Collective: Group with a focus on accessibility, equity, and social justice as related to accessing science and science communication.
https://www.scicommcollective.com/

The SciCommer: Science Communication newsletter including content from around the world. https://thescicommer.substack.com

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Thank You!

We hope you enjoyed experimenting with the ideas in this workbook and that you feel inspired to engage creatively with your research. Whether that involves adding artistic flair to plots and figures or making something completely new, we wish you luck on your science-art journey and can't wait to see what you create.

MEOPAR

Samantha Jones is a PhD Candidate in Geography at the University of Calgary. Her research focuses on inorganic carbon cycling in a connected lake, river, and coastal ocean system in Iqaluktuuttiaq (Cambridge Bay), Nunavut. She is a writer and poet with creative works published in magazines and academic and literary journals including GeoHumanities, Arctic, THIS, Room, CV2, Grain, and elsewhere. Her poem, "Ocean Acidification," first published in Watch Your Head, was developed into a multimedia clip with science and policy partners and later included in the Virtual Ocean Pavilion at COP26.

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