



California Water Boards OpenScapes Implementation Strategy

February 2022



California Water Boards
COLLEGE OF WATER INFORMATICS

Executive Summary

The Water Boards have a shared mission to preserve, enhance, and restore the quality of California's water resources. Our ability to achieve this mission faces many challenges, including systemic social and environmental injustices, institutional silos, and the ever-increasing impacts of climate change (i.e., increased intensity and frequency of droughts, fires, floods, etc.). The Water Board, through the Racial Equity and Open Data Resolutions, is committed to advancing racial equity, environmental justice, open and transparent water data, and creating internal and external spaces where people feel they belong.

Openscapes, through their Champions Program, provides a framework for education, integration, and operationalization of open science, racial equity, and kindness into individual and team collaborations and workflows. Openscapes safely structures and normalizes discussions about our work - what we do, how and why we do it, and how we might be able to do it better - so that individuals and teams can develop discrete and actionable steps that not only enable them to more efficiently and effectively meet their programmatic missions, but also to shift their perspectives, culture, and behaviors so that they are better able to implement strategic actions that put the integrated principles of open science and equity into practice.

Open data and products are foundational to transparent and equitable government; equally important is how we use our data and information to develop regulatory positions and rationale for operational and executive decisions. Openscapes builds from the foundation of data transparency and equity to help develop processes that are reusable and resilient, and that produce interim and final products that value, express, and center multiple perspectives and interests. This work is foundational to being better stewards of the vast amount of information and interests that are needed to do better planning, regulatory and financial assistance work, and to ultimately meet the shared mission of the Water Boards.

This Implementation Strategy provides more details on recent Openscapes efforts at the Water Boards as well as a detailed implementation plan and timeline for annual cohorts moving forward, including in 2023.

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Introduction

Need for Openscapes at the Water Boards

The State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards), collectively known as the California Water Boards (Water Boards), are dedicated to a single mission:

To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.

Achieving this mission is vital to the health and well-being of all Californians, California Native American Tribes (tribes), the economy, and watersheds for present and future generations.

In recent years, the State Water Board has committed to a number of cultural and programmatic changes related to open data and racial equity. The Open Data Resolution ([Resolution No. 2018-0032](#)) adopted principles of open data as a core value and directed programs and activities to implement strategic action to improve data accessibility and associated innovation. The Racial Equity Resolution ([Resolution No. 2021-0050](#)) condemned racism, xenophobia, bigotry, and racial injustice and strengthened commitment to racial equity, diversity, inclusion, access, and anti-racism and directs staff to undertake a variety of actions to achieve racial equity throughout all Water Boards programs and activities.

Each of the above resolutions has an accompanying implementation strategy: the [Strategic Data Management Action Plan](#) (also see the related [Data Literacy Strategy](#)) and Water Board [Racial Equity Action Plan](#), respectively. Many Water Boards Divisions, Regions, Offices, and Programs are doing their best to implement these actions into their work. However, implementation to date has been somewhat separate, meaning some people work on implementing principles of open data while others work on implementing principles of equity. While limited staff bandwidth and resources are undoubtedly key contributors to this trend, it is also largely due to a lack of training, education, and guidance on how these principles and plans are integrated and inextricably linked to one another.

To date, the implementation and integration of open data principles throughout the Water Boards has come from a largely technical perspective with a focus on making process, data, code, publications, etc. more transparent, open, and accessible on

websites like the [California Open Data Portal](#), [databases](#), or [GitHub repositories](#). Implementation and operationalization of equity throughout the Water Boards has only just begun and, thus far, has focused on education and normalization of concepts related to equity. To successfully achieve the open data and equity outcomes we seek, it is crucial that we shift our perspectives, culture, and actions towards open science so that the principles are fully integrated and operationalized.

The true spirit and ethos of open science sits at the nexus of open data and methods, effective and impactful communication, and - equally - putting the principles of equity, inclusion, and belonging into practice.

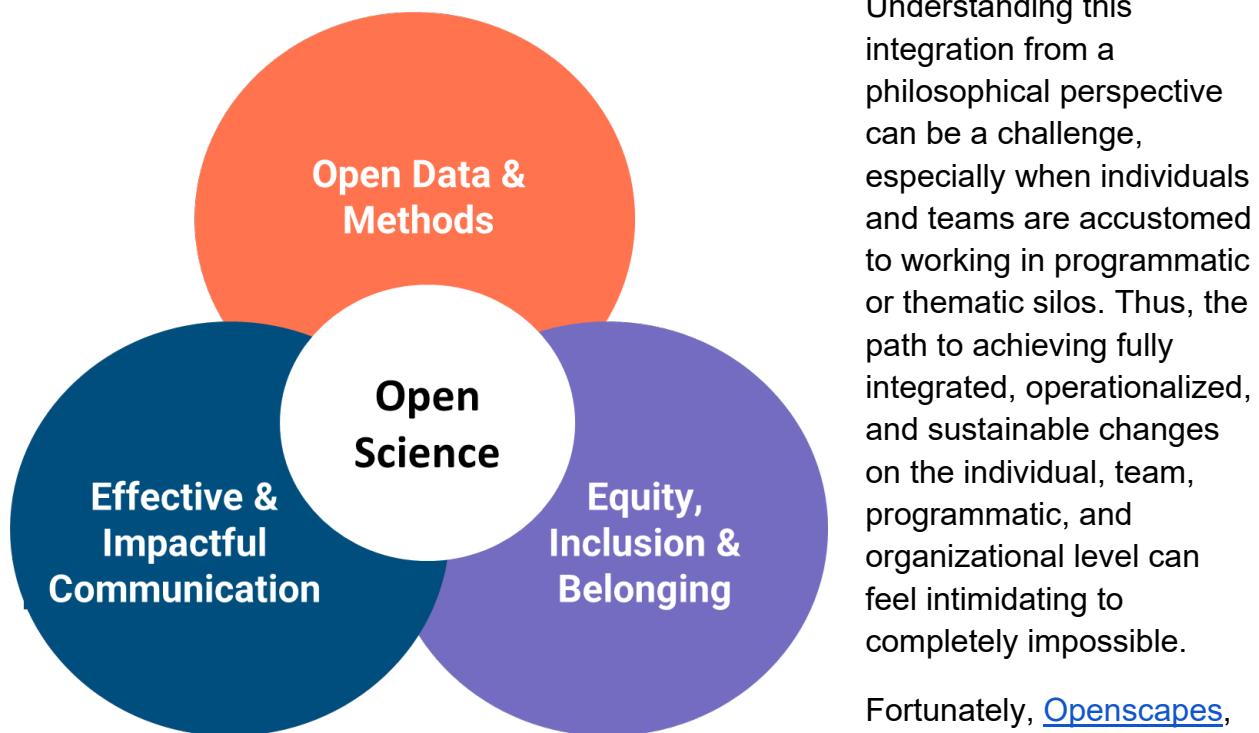


Figure 1. Open science integrates skills and perspectives from open data and methods; equity, inclusion, & belonging; and effective & impactful communication

operationalization of open science, racial equity, and kindness into individual and team collaborations and workflows. Openscapes safely structures and normalizes discussions about our work - what we do, how and why we do it, and how we might be able to do it better - so that individuals and teams can develop discrete and actionable steps that not only enable them to more efficiently and effectively meet their programmatic missions, but also to shift their perspectives, culture, and behaviors so that they are better able to implement strategic actions that put the integrated principles of open science and equity into practice.

Openscapes Pilot

In 2021, two staff from the Office of Information Management and Analysis ([OIMA](#)) at the State Water Board were assigned to serve as mentors for two Openscapes Cohorts: Fisheries Dependent Data Users ([FDD](#)) and NOAA's National Marine Fishery Service ([NMFS](#)) Champions Cohorts. During this time, OIMA staff were tasked with learning more about the Openscapes Champions Program and determining whether and how we could bring the Openscapes mindset and process to the Water Boards and our diverse network of partners and collaborators. For more details on why we chose to be mentors and what we learned from the process, see this [Openscapes Blog post](#) from December 2021.

In 2022, we wanted to share what we learned and the Openscapes Champions Program as a whole with the Water Boards and our partners. We wanted to explore whether the Champions Program could realistically be scaled throughout the Water Boards given the workforce's limited bandwidth (available time and resources). So, we worked with the [Openscapes team](#) to plan and execute a Champions Cohort at the Water Boards. While cohorts are typically led by the Openscapes team, this was the first to be led by Openscapes mentors and the first Champions Cohort at a US state government agency. To learn more about other previous cohorts, explore the [Openscapes Champions Cohorts List](#).

The 2022 Water Boards Champions cohort ([2022-swrcb](#)) was developed to intentionally customize the Champions Program to better serve our current organizational framework and needs. This included working with managers from OIMA and the Division of Water Quality (DWQ) to select teams for the pilot, and customizing meeting length, structure, and content to center culture, equity, and the importance and benefits of documentation, and to give teams more time to dive into and discuss these topics.

Normalizing language, process, and changing behaviors and actions to support more open and equitable workflows and mindsets can be a challenging shift for teams. Despite these challenges, the post-cohort survey suggested that ultimately, Openscapes did help individuals adopt an open mindset towards their work, their teams, and themselves - and that teams are now evolving their processes, behaviors, and actions to be more open, inclusive, and kind:

"It has been a great opportunity for me to slow down and take the time to evaluate / check-in on my work and team workflow / processes. Many of the things we discussed are totally in line with my personal philosophies / approaches but I haven't really put time into thinking about how to establish those things through documentation. I tend to be an individual

worker bee and appreciate the co-working concepts and getting more comfortable in that shared space to do work!"

"How important it is to...give people the space to work and try new things. I think I've better internalized that it's okay to share imperfect work."

"Now that more staff have been exposed to the Openscapes principles, I think I will be more comfortable suggesting the use of tools like Git / GitHub and code-based workflows. In general, I will also be more comfortable suggesting that we use better project management practices and think about things like documentation / reproducibility as fundamental parts of our work, and not just make those an afterthought."

Additionally, Cohort members largely responded that other Water Boards colleagues would find the Openscapes Champions Program valuable.

For more details on why we led a Champions Program Cohort at the Water Boards and how we did it, including details about our process, outcomes, and what we learned, see this [Openscapes Blog post](#) from December 2022.

Vision for Openscapes at the Water Boards

The Water Boards is working towards a future where our workforce:

- understands the interconnected nature of open data and equity principles and is able to clearly articulate the specific actions they (as individuals and/or teams) will take to evolve their processes, behaviors, and actions to be more open, inclusive, reproducible, and kind
- is empowered to reimagine their [data life cycles](#), see data stewardship as a collaborative effort, and develop modern skillsets and mindsets for modern data-intensive science that are of immediate value to them
- is able to cultivate collaborative and inclusive work cultures so that individuals and teams feel [psychologically safe](#) to ask questions, innovate, fail, and try again

Purpose of this Openscapes Implementation Strategy

With the 2022 Water Boards Champions cohort feedback in hand, it became clear that:

- 1) The 2022 Pilot was a success and well worth the time and resources the Water Boards (OIMA and DWQ) invested into the process over the previous two years
- 2) The primary next step is to strategize iteration of the Openscapes Champions Program and process throughout the Water Boards

The purpose of this Openscapes Implementation Strategy is to document our goals for iterating on this work, as well as to articulate the target audience of these efforts, our implementation plan, anticipated timelines, and plans to address potential challenges we may encounter throughout the process.

This Strategy has been developed to address the issues and needs of the Water Boards workforce as they are now, but also with the intention of being an adaptable and living document so it can be revised as the Openscapes process and mindset diffuse throughout the organization and the needs of the Water Boards evolve.

This Strategy was developed by the Water Boards Openscapes Team:

- Greg Gearheart, Deputy Director, OIMA
- Anna Holder, Environmental Scientist, OIMA
- Corey Clatterbuck, Environmental Scientist, OIMA
- Devan Burke, Associate Governmental Program Analyst, OIMA
- Tina Ures, Engineering Geologist, DWQ

Target Audience

The Openscapes Champions Program is a remote-by-design, cohort-based mentorship program that supports teams of up to 6 colleagues to reimagine data analysis and stewardship as a collaborative effort, develop modern skills that are of immediate value to them, and cultivate collaborative and inclusive communities. Teams will focus on their own work with their teams to identify where they are and where they want to go. It's important to note that individuals and teams do not have to have familiarity or expertise in open science or data science fields to benefit from the Openscapes Champions Cohort.

Characteristics of teams that will get the most return on their investment into the Champions Program include:

- Team members are given the approval and support they need from their management to dedicate the time required to actively participate and engage in the Openscapes Process. The minimum and required time commitment is 2-4 hours/week over 10 weeks for meetings and associated work; more details on this will be provided in the [Cohort Process](#) section.
- Teams that have at least one or two members who do some form of data management, analysis, visualization, or communication in their work on a regular basis. The more regular this work occurs (e.g. weekly is better than quarterly), and the more technically advanced they are (e.g. coding in R, Python or SQL is better than Excel), the more the *entire* team will get out of the process.

- **All** team members are interested in exploring the interconnected nature of open science and in taking time to reimagine data workflows and stewardship as a collaborative effort, develop modern skills that are of immediate value to them, and cultivate collaborative, inclusive, equitable, and kind teams and communities.
- Teams want to evolve and invest in their culture, processes, and workflows so that they can embody the [better science for future us mindset](#).
 - “Better science” means science that is more open, reproducible, efficient, and also more diverse, equitable, inclusive, kind.
 - “Future us” is ourselves, teams, communities in the next hour, week, decades – with a focus on onboarding ourselves and others to ongoing work.

Implementation Plan and Timeline

The successful implementation of this Strategy requires intentional actions that balance our desire to rapidly diffuse the insights and benefits of the Openscapes Champions Program throughout the Water Boards and the reality of limited Program and implementation resources (e.g., staff time, funding). To maintain this balance, this Strategy will be implemented through an annual cycle that will include five phases:

1. Internal Outreach and Education (Jan - Jun)
2. Cohort Application Period (Jun)
3. Pre-cohort Planning and Engagement (Jul - mid-Aug)
4. Cohort Process (mid-Aug - mid-Oct, with one follow-up meeting in Dec)
5. Reflection and Revision (Nov - Dec)

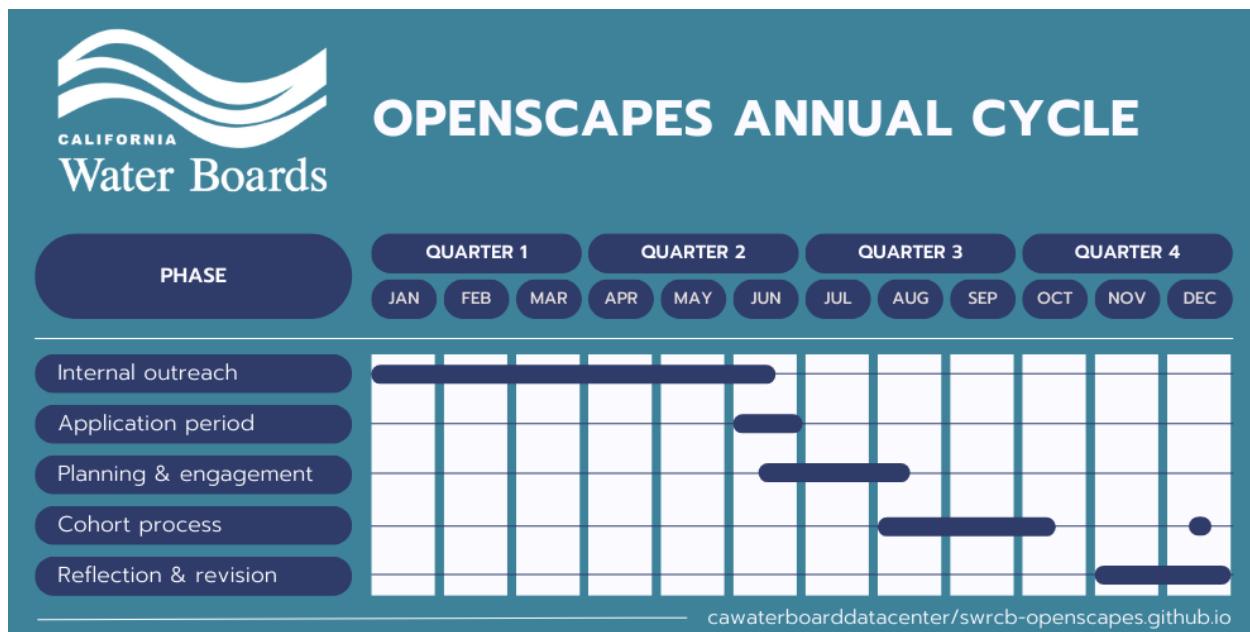


Figure 2. Openscapes at the Water Board will be implemented via 5 phases in an annual cycle.

Internal Outreach and Education

January - June (6 months)

The Openscapes Champions process and mindset is new to the Water Boards and has only really been exposed to individuals and programs that have direct connection to the pilot efforts. During the first iteration of this Strategy in 2023, the Water Boards Openscapes Team will present about this work and its future in our organization to management, internal roundtables, and work groups. Current presentation venues under consideration include:

- MCC (Management Coordinating Committee)
- DMC (Deputy Management Committee)
- “Let’s Git Lunch” GitHub Group
- Roundtable (RT) Meetings (e.g., GIS Data Science RT, Integrated Report RT)
- Other RTs, groups, or teams upon request

Cohort Application Period

June (1 month)

In June, we will invite team leads to [nominate their teams](#) for the upcoming Water Boards Openscapes Cohort by completing a relatively simple application. The Microsoft

Form Application will be used to gather team lead and team member contact information, get an understanding of the team's interest in and readiness to participate in the upcoming Water Boards Openscapes Cohort, confirmation that the team has approval to participate in the cohort, and confirmation that the team will commit to attending all pre-selected cohort call dates/times in mid-August through mid-October of that year.

While Openscapes works to level power structures within teams, at this stage, the applicants (frequently supervisors) are critical liaisons between the Openscapes instructors and their team members for scheduling and communication purposes. As a part of these application requirements, we expect applicants to introduce their team members to Openscapes in whatever way makes sense to them -- for example, by attending one of the Outreach and Education events, discussing Openscapes in a team meeting, and/or providing an introduction to Openscapes background and materials via email. We are looking for entire teams that are ready and excited to participate and will not be surprised by an invitation to join an Openscapes Cohort.

Pre-cohort Planning and Engagement

July - mid-August (1.5 months)

In July, the Water Boards Openscapes Team will review the team nominations and select the teams that will be invited to participate in the upcoming cohort. All applicants will be notified of whether they were selected for the upcoming cohort.

For teams that are invited to participate in the upcoming cohort, the team applicant will have 1 week to confirm their participation. Once confirmed, the entire team will be emailed congratulating them on their selection for the incoming cohort and requesting them to book a short 1:1 Intro Call with the Cohort instructors so that team members and instructors can start getting to know each other, share more details about the Champions Program, learn about the team, how they work, their goals for the Cohort, and answer any questions.

Approximately 1 month before the beginning of the Cohort, teams will be sent a welcome email that contains information about the upcoming cohort and how they can prepare, as well as calendar invitations to all upcoming Cohort Calls (mandatory), Co-working Sessions (optional), and a hold for the 2-month check-in post-cohort.

Approximately 1 week before the start of the Cohort, teams will be emailed a Cohort Call reminder and a few action items that individuals need to complete before the start of the Cohort.

During this phase, the Water Boards Openscapes Team will also:

- Work with the external and internal Openscapes communities to identify, invite, and coordinate guest teachers to present topics during Cohort Calls.
- Set up all necessary documentation (e.g., Cohort sharing folders, Cohort Call agendas, GitHub repositories, lesson plans and presentations).
- Invite all incoming team members to the internal Water Boards Openscapes Microsoft Team so they can introduce themselves to the Water Boards Openscapes Community.
- Invite and onboard identified Openscapes mentors to the Openscapes Team, as appropriate.

Cohort Process

Mid-August - mid-October (3 months)

Cohorts will be composed of:

- 2 instructors, who will lead calls and content
- 2 mentors, who will support calls and develop call [digests](#) (meeting summaries)
- 3 to 6 teams of no more than 6 individuals per team

Selected teams will participate as a Champions Cohort over the course of 2 months. During that time, they will attend mandatory Cohort Calls and Seaside Chats, and may also attend optional Co-working Sessions.

Cohort Calls are mandatory 2-hour meetings where the bulk of content is delivered to all teams in the Cohort. The topics covered during lessons include: the Openscapes mindset, team culture, GitHub, as well as data, documentation, and workflow strategies for “future us”. Openscapes publishes the [lessons for each meeting](#). However, the Water Boards Openscapes Team has customized content and the order of topics in each Cohort Call to better serve the current Water Boards framework and needs. The specific content, activities, and discussions of each call is different but generally have the following core structure:

- Roll call with ice breaker
- Welcome with Code of Conduct reminder
- Lesson with activity 1
- Lesson with activity 2
- Closing reflections, efficiency and equity tips, and reminders



OPENSCAPES COHORT PROCESS

CAWATERBOARDDATACENTER/SWRCCB-OPENSCAPES.GITHUB.IO

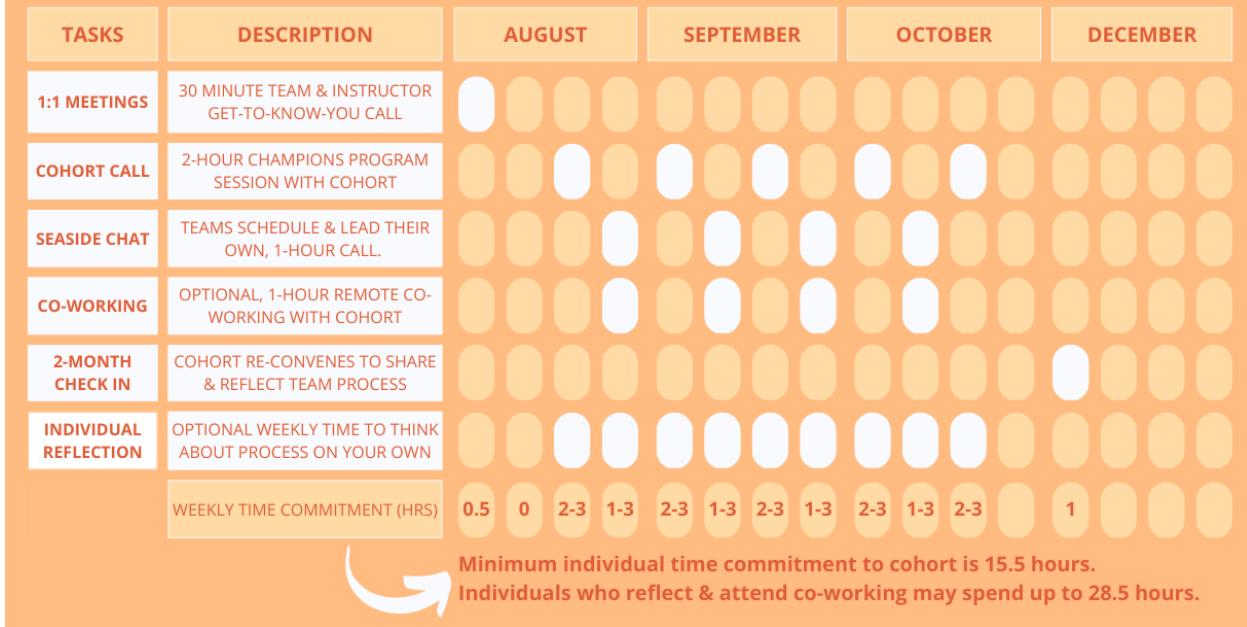


Figure 3. The Openscapes cohort process above shows the estimated weekly and overall time commitment each individual in the cohort will dedicate to Openscapes tasks.

Seaside Chats are mandatory 1-hour meetings that are scheduled and led by each team. This time is for teams to meet, outside of the full cohort, so that they can reflect on past cohort meetings or prepare for an upcoming cohort meeting. It is a time for the team to share questions they have, follow-up on call topics, and/or work on their shared Pathway Spreadsheet. See the [Expected Products and Outcomes Section](#) for more information on the Pathway Spreadsheet.

Co-working Sessions are optional 1-hour meetings that are scheduled by the Water Boards Openscapes Team. This is a time for individuals and teams to come together outside of the formal Cohort Calls and Seaside Chats to practice building and implementing skills and principles that are discussed during the Cohort Calls.

It is also highly recommended that individuals allocate approximately 1 hour per week to individual reflection and work related to the Openscapes process.

The aggregate time participants will need to commit to the Cohort Process comes out to approximately 2-4 hours per week, depending on whether they take part in optional Co-working Sessions and how Cohort Calls and Seaside Chats fall on their calendars.

Reflection and Revision

November - December (2 months)

During or shortly after the last Cohort Call, individuals will be asked to complete [a brief survey](#) to provide formal feedback (anonymous or named) on their Openscapes Champions Program experience.

Approximately 2-months after the last Cohort Call, Teams will meet for one final 1-hour Seaside Chat with all other teams to reflect on how things have been going over the past two months, and to share any challenges, successes, and vision for how they will continue operationalizing the open science principles discussed during the Openscapes Cohort process.

During this phase, the Water Boards Openscapes Team will also:

- Review and reflect on the results of the survey. The detailed feedback shared during this survey will be shared with the Water Boards Openscapes Team, Openscapes leadership to help improve Openscapes at the Water Boards and as a whole so we can grow our community and better support each other. We would like to share survey results with Water Boards management, including support needs for continued open science work. Generalized and/or anonymized feedback and key lessons may be shared to the broader Openscapes Community.
- Plan for the next year's Openscapes process, including adjusting or revising any of the phases outlined above to improve the process and experience for the next cohort.

Expected Outcomes and Products

One of the core concepts in the Openscapes Champions Program is that open science is a landscape of open data, tooling, and communities, with many existing paths forward, as well as opportunities to create new paths together.



Figure 4. Openscapes provides a framework for teams to explore the landscape of open science. Original artwork by Allison Horst.

The illustration on the left represents the concept of the open science landscape.

How individuals and teams navigate through the landscape depends on team and work culture and the level of access they have to the tooling and communities that can support their work.

For many, entering or navigating the landscape can feel intimidating, frustrating, or just plain sad - like the rabbit and skunk under lonely rain clouds in the bottom left of the figure. It can also feel isolating and lonely - like the little hermit also on the bottom left of the figure, with the landscape just out of view.

The Openscapes Champions Program supports individuals and teams to find common parts of their work - whether they are working on the same or different projects - and come together as a broader community so navigating the landscape isn't so lonely. The Openscapes Champions Program also creates space to discuss topics, approaches, and tools to help teams identify their proverbial trailhead so they can safely navigate this landscape, help each other, and welcome others as they go - like the group of animals surrounding the fox with a welcome sign on the bottom right side of the figure.

Expected Outcomes - By the end of a cohort, individuals and teams are expected to:

- Gain a greater understanding of the open science landscape, and the tooling, concepts, and communities available to support them in their work.
- Be able to identify:
 - Where they are now in the open science landscape (i.e., how do we work currently?)
 - Some idea of where they want to go (i.e., how do we want to work differently in the future?)
 - Some discrete, actionable, and (ideally) immediate next steps they can take to work toward the future they want for themselves and their work (i.e., what processes, workflows, tools can we change or evolve to improve our work for future us?)
 - Some other individuals, teams, and communities inside and outside of the Water Boards that they might be able to connect with to support them as they navigate the landscape

The Openscapes Champions Program provides the space and time for teams to learn about and integrate concepts (e.g., open science, team culture, and equity), explore and test new tools (e.g. GitHub as a coding and project management tool), and to explore where they are and where they want to go in the open science landscape.

The structures that hold the space and time for this learning include:

- Mandatory Cohort Calls and Seaside Chats, and optional Co-working Sessions (see the [Cohort Process](#) section above for more details).
- Shared agenda and notes documents that enable individuals to document questions, ideas, sticking points, key learnings, etc. with the rest of the cohort and see the same from others as well as where there are commonalities across the cohort.
- Team Pathway Spreadsheets, which provide a structured way for teams to think through how they work, find common approaches and needs, and identify next steps to achieve better science for future us. An example of a traditional Pathway is provided below (Figure 5) and shows how the team is documenting what the team is working now and ideas for next steps. However, the Pathway is flexible and can be illustrated in multiple ways (Figure 6). The Pathway development process also carves out space for teams to think about their data workflows and reproducibility as well as how they collaborate and communicate with each other and their partners, and what they can do to create a team culture they all want to be a part of.

Openscapes Pathway	Topic	Now	Next steps
Reproducibility	Data storage	icloud and google docs, dropbox	Github and Rmarkdown
	Metadata	A sheet in each excel doc	A metadata sheet for Github?
	Data prep	Excel files, Rstudio	Data cleaned up on Github, protocol
	Data analysis	Rstudio, minitab, JMP	Uniform coding practices in R
	Version control	Some people work in google docs, microsoft suite	Github and Rmarkdown
	Organization	Solo	Github
Collaboration	Lab notebooks and protocols	Some of them in our google folder, computer	Github, read me file!
	Coding	Email, evernote	Github, use projects!
	Storing data	Google drive, one drive, icloud, computers, harddrives, cluster	Github, large files -> google drive/dropbox, github?
	Internal discussions	Lab meeting	Lab Slack channel
	File sharing	Email and Google Drive	Github
	Project management / to-do lists / milestone tracking	Google calendar, sticky notes, blank pieces of paper	Lab notebook function on Github
Communication	Onboarding	Google documents, EH&S trainings	Github for specific projects, lab notebooks
	Sharing data	Google spreadsheets	Github
	Sharing methods	Lab Google Drive folder	Github, slack
	Talks	icloud, google drives	None right now
Culture	Teaching	Canvas, zoom, google docs, kahoot	Github, slack
	Team agency (ability to make decisions)	Lab meeting	Data science meetings, slack chat
	Supervisor sponsorship	Lab meeting every week to check in mentor and students	Data science meetings!
	Promoting DEI	DEI discussions + folder with resources	New discussion leads
	Seaside Chats	Zoom	In person!

Figure 5. An example completed Pathway document. The Pathway is provided to cohort teams with the ‘Now’ and ‘Next steps’ columns blank, and cohort teams fill out these columns together during Seaside Chats. Teams are free to amend the Pathway structure for their own purposes.

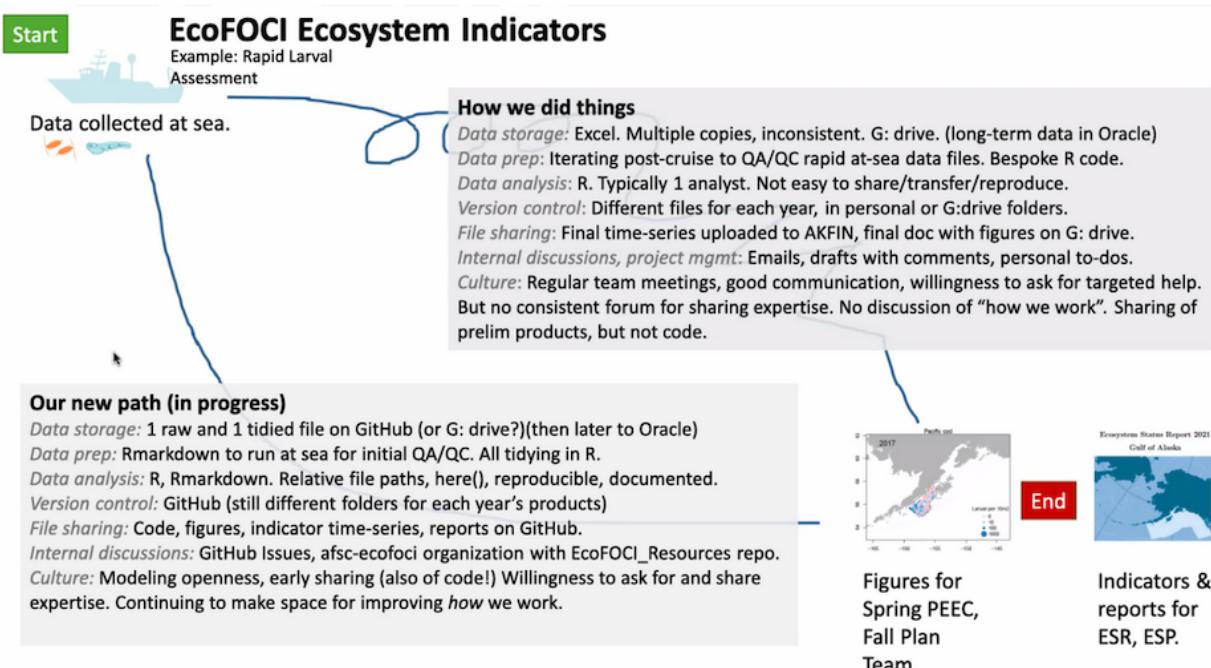


Figure 6. Example pathway flow chart provided by the EcoFOCI team at the National Oceanographic and Atmospheric Administration (NOAA).

Openscapes is also designed to be instructed iteratively. After the Cohort process is complete, the mentors who assisted the instructors will be prepared to lead future Openscapes cohorts as instructors. The mentor role is open to previous cohort members and any individuals in the Water Boards who are able to commit to meeting and assisting every other week throughout a Openscapes annual cycle. Ultimately, we envision a growing Openscapes team with instructors and mentors who are able to rotate in and out of instructing cohorts as the program grows.

Expected Products - Throughout the cohort process, individuals and teams are expected to:

- Attend and be actively engaged at every mandatory meeting (Cohort Calls, Seaside Chats)
 - While this does not result in a tangible product, we wanted to include this here since it does significantly contribute to the experience for the individual and the entire cohort. Individuals and teams only get out of the process what they put into it - so the more engaged they are in the process, the more progress they will make, which will inevitably result in a greater return on their investment of time and energy into the process.
- Contribute to discussions and add to the shared agenda and notes documents for each Cohort Call.
 - This does not mean that attendees will act as note takers and capture everything that is said during Cohort Calls.
 - This does mean that attendees are expected to contribute to the documents in a way that allows them to also absorb content and material and actively contribute to discussions.
- Contribute to and populate their team's Pathway Spreadsheet throughout the Cohort process (e.g., during Seaside Chats), and help the team prepare to present their Pathway Spreadsheet during the share-outs in the 5th Cohort Call.
 - Note that the process of filling out the Pathway Spreadsheet as a united team is what is most important. The Pathway Spreadsheet is a resource and tool for the team and will not be evaluated in any way by Cohort instructors or mentors.

Teams in other Openscapes Cohorts have used the Champions process and Pathway Spreadsheet as a way to identify and prioritize next steps for evolving their workflows, and to kick-start their documentation goals.

Some great examples of products that were developed after a formal Openscapes Champions process include:

- [The Fay Lab Manual](#), which explicitly spells out the lab's [culture and philosophy](#), shared norms (e.g., [onboarding](#), [offboarding](#), [communication](#)), and expectations (e.g., [logistics](#), [code of conduct](#)).
- NOAA - Alaska Fisheries Science Center [Stock Assessment Standard Operating Procedure](#), which informs admitted users how to access stock assessment data, provides data dictionaries, and provides contact information for different data sources.
- The SWAMP team in OIMA is continuing to build their co-working skills via 'SWAMPside chats' on alternating Fridays. These optional, remote, agenda-free chats are times to skill share, collaborate, or problem solve together. In particular, the team is building a SWAMP manual in the style of the Fay Lab Manual to define and make their work culture transparent and onboarding internal staff or external collaborators consistent.

Potential Challenges

Any new effort that is meant to scale and shift the culture of an entire organization is bound to experience some challenges. Here we describe some potential or anticipated challenges that we may face throughout this process as well as strategies we intend to use to prevent or address them.

1. Lack of understanding of the Openscapes Process

- a. We are well aware that many individuals and teams at the Water Boards are not yet familiar with Openscapes or the Champions Program. This is the impetus for developing this Water Boards Openscapes Implementation Strategy and why we are planning on dedicating the first six months to each calendar year to internal outreach, education, and engagement.

2. Lack of interest in the Openscapes Process

- a. The results of the [Data Literacy](#) and the [Racial Equity](#) Surveys make clear that there is interest throughout the Water Boards. Staff at multiple levels of our organization want to learn about open science and racial equity principles, as well as how to put those principles into practice. Moreover, the survey results from the 2022 pilot showed that Cohort members felt that other Water Boards colleagues would find the Openscapes Champions Program valuable and be interested in participating in the process.

- b. While the survey results above indicate broad workforce interest in data literacy and racial equity, not every team at the Water Boards may be ready, curious, or available to learn and apply practices from the Openscapes process. That is okay! At this stage, we are seeking [early adopters](#) of open science principles. As Openscapes continues to stage through additional mentors and cohorts, more Water Boards teams will be ready to engage with these materials.

3. Limited bandwidth or capacity for teams to participate in the Openscapes Process

- a. All members of the Water Boards Openscapes Team are all too familiar with this challenge. We are structuring the implementation of this strategy to balance our individual workloads. Additionally, we have structured the Cohort Process so that participants are able to get as much return on their investments into the process as possible.
- b. By implementing an application process, team leads will need to assess whether their teams are ready and able to carve out the time and space required to complete this process and obtain approval to do so.

Additional Resources

- Openscapes Blogs written by the Water Boards Openscapes Team:
 - [California Water Board Mentor Perspectives](#) (Dec 2021)
 - [ESIP Better Science for Future Us - Planning for the Year of Open Science](#) (Feb 2022)
 - [Adapting the Champions Program for the California Water Boards](#) (Dec 2022)
- Beck et al. 2020. [The importance of open science for biological assessment of aquatic environments](#). PeerJ.
- Lowndes 2019. [Open Software Means Kinder Science](#). Scientific American.
- Lowndes et al. 2017. [Our path to better science in less time using open data science tools](#). Nature Ecology & Evolution.

Contact Information

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