Partnership Grants Midterm Report

File number:	895-2019-1015
Host institution:	University of Waterloo
Project director:	BEDNARSKI, Steven
Project title:	Environments of Change: Digitizing Nature, History, and Human Experience in Late Medieval Sussex

The Midterm Report should provide an overall view of what the partnership has accomplished by the midpoint of the award, and provide sufficient information to allow the Midterm Review Committee to assess the progress of activities undertaken during this time. It is both a description of the activities and accomplishments to date, and a forward-looking document that confirms and updates the plan of activities designed to ensure the achievement of the stated goals and objectives of the partnership. It is expected that key members of the partnership will participate in the preparation of the report's contents and endorse it prior to submission.

Instructions: Please submit your report in a Word format. Provide information about your project for each of the seven evaluation criteria listed below. For each of the green text boxes below, provide the information requested while limiting your responses to 500 words. If you choose to include any charts, tables, graphics, diagrams, images, etc., include these as a separate appendix document. In total, keep the appendices to a maximum of twenty pages. Do not enter text in the blue text boxes. The midterm review committee will assess your progress (i.e., exceeds expectations; meets expectations; may not meet expectations, clarification required; does not meet expectations) and provide feedback in the blue text boxes.

Progress Summary

Provide a plain-language summary of the results of your project to date.

Project Response:
In our Stage 2 application, we identified 8 Goals and Objectives, all of which have produced results: **O1. Create North America's first permanent humanities lab dedicated to the digitization of environmental history (Digital Research in Arts and Graphical Environmental Networks Lab, aka DRAGEN Lab)** Completed. We secured funding from the host institution for and completed the construction of the DRAGEN Lab. It provides 3,600 ft² of state-of-the-art digital humanities spaces, a repository to conserve and digitize our growing collection of medieval artefacts and documents, collaborative meeting spaces, and offices. The Lab coordinates about a dozen industry partners, the project participants, and the large number of HQP whose formation we support. Though the Lab went live during the pandemic with a limited staff, as of September 2022, it now supports a large team of researchers and has already hosted KM events.

Project Response:

O2. Provide 400+ Highly Qualified Personnel (HQP) training opportunities

Progressing well and on-track for success. The pandemic complicated our plan to provide HQP training in Britain, as all academic institutions restricted international travel. Similarly, with the closure of businesses and the shift to remote work, our opportunities to place HQP in co-op positions with corporate partners was severely limited. As a result, we undertook several strategies to reallocate resources while still providing a high number of HQP opportunities. As of September 2022, we have provided 132 undergraduate, graduate, and postdoctoral HQP training opportunities.

O3. Gather, analyze, and disseminate missing historical, archaeological, and proxy data from southern England, c. 1000–1550

Progressing well and on-track for success. Since we were restricted in our ability to move HQP to the UK, we reallocated available funds and made a greater investment in O3. This investment came in the form of a new partnership with Oxford's dendroclimatology lab and the addition of a new co-investigator, Dr. Neil Loader. Loader's team has developed a palaeoclimatological analysis that draws on wood core samples from across SE England. Carbon analysis of these samples continues, and we have begun to publish results.

O4. Design a pedagogical video game for young learners based on medieval environmental history

Progressing well and on-track for success. The video-game design team, led by co-investigator, Dr. Nicholas Graham (Queen's University), has designed a prototype tablet-based game centred on our team's augmented reality reconstructions of the deserted medieval village of Northeye (**see Figure 1**). We have been delayed in testing the game in classrooms since our partner, the Waterloo Region District School Board, restricted all external access to classrooms until September 2022. We are now undergoing ethics review with the WRDSB to begin play testing, a research process required to publish results. We continue to add new levels to the game, acquire new assets, and develop additional complimentary analogue resources for classroom teachers.

O5. Design AR/VR tourism apps, with the intent of sharing the platform with other tourism sites / locations

Delayed due to pandemic. The restriction of international travel and the closure of partnered tourism sites in the UK made it largely impossible to advance this objective. Since we had limited remote access to our research base in the UK, we deployed at Herstmonceux small teams of HQP to develop sample tours of that property, which we made available to UK visitors and online viewers.

O6. Collect geographical data and generate novel 3D models and digital maps of environmental and landscape features

Progressing well and on-track for success. In 2020, we acquired, using matching funds, a high-resolution lidar camera and drone to conduct aerial imagery. While we were unable to deploy the drone team to the UK during the pandemic, once international travel resumed, we began data collection. In April 2022, we hosted our first Annual General Meeting (AGM) in the UK (Herstmonceux Castle). In the leadup to that meeting, our lidar team deployed the drone and completed high-resolution imaging of the entire Hersmtonceux estate (**see Figure 2**). Since April, we have made available online and to partnered agencies preliminary images, maps, and video. Our team is now in the process of making data available in open-access format through ArcGIS. In years 4–7, we will replicate this process for other areas of southeast England.

Our overarching purpose was never to focus solely on Sussex, but rather to develop transposable interdisciplinary methodologies for application to different periods and places. We have realized this through the incorporation of a parallel project in the Mediterranean, directed by new co-investigator, Dr. Geneviève Dumas (Université de Sherbrooke). Dumas supervises a PDF and has produced interactive digital maps that show the impact of flooding on southern French communities.

O7. Design the first interactive digital database of stored artefacts for a widely-accessible archaeological repository in East Sussex

Project Response:

Reconfigured due to external conditions and progressing well. Following UK austerity measures in the wake of Brexit, Partner the East Sussex County Council, suffered significant budgetary cuts and was forced to cancel all initiatives that were not essential to their core mandate. This rendered it impossible to produce a digital database of archaeological objects collected by the Council.

Subsequently, we identified a smaller community partner, Bexhill Museum, who granted us access to an extensive, archaeological store of previously undocumented artefacts. With the resumption of travel in May 2022, we sent student HQP, through an expanded partnership with Toronto Metropolitan University, to document and study those artefacts. That team produced a detailed report on the collection as a first step in cataloguing the contents. They also began working with mobile high-resolution 3D scanning to produce our first open-access shapefiles, which will be added to an online repository.

Concurrently, new community partner, Anishnabeg Outreach (AO), approached us to collaborate on the 3D scanning of indigenous artefacts to build a large online repository. We have begun the digitization process with AO and new partners, including the Royal Ontario Museum. This second repository, focused outside of Sussex, allows us to transpose the methodology we have developed to support indigenization and community outreach.

We similarly transposed our method with co-investigator Dr. Paul Lovejoy of York University, and new partner Walk with Web project. Through this extended partnership, we contribute to the expansion of online platforms that conserve documents from Sierra Leone, West Africa, and that support the development of digital simulations based on historical / ecological augmented reality reconstructions. This collaboration has led to the development of a second pending SSHRC Stage 2 PG application.

O8. Fund new digital seed projects on historical nature and culture (up to $20,000 / project)

Progressing well and on-track for success. As noted in O7, we have funded expanded projects with an indigenous community partner, and with new partners in southern France and West Africa.

1) Research and/or related activities are proceeding and evolving as planned or, if not, the partnership has overcome challenges and adjusted plans appropriately and effectively to keep the project on track.

With respect to the project's research and/or research-related activities, explain your accomplishments to date and the extent to which your project is meeting the measures of success as outlined in your application and/or Milestone Report. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvement related to research activities, describe how this feedback has been addressed. If you have experienced challenges, describe them and how they have been addressed. If you have significantly adjusted your plans, explain and justify these changes. Finally, briefly outline your plans moving forward and describe how they will allow you to meet the goals and objectives of your project.

Project Response:

At the outset, it is important to acknowledge the operational disruption caused by the recent COVID-19 pandemic. Our research depends largely on connecting researchers and HQP in Canada with physical sites and agencies in Sussex. The cessation of international travel, coupled with institutional policies restricting external research, and the closure of public archives and tourist destinations for two years presented significant obstacles. Compounding the challenge of accessing historical sites, archives, and partnered agencies in the UK was the decision of the UK government to withdraw from the European Union in January 2020. This had an indirect impact

Project Response:

on our UK partnerships, since a key government partner, the East Sussex County Council (ESCC), saw a significant reduction in its budget and widespread staff layoffs.

We are pleased to report that, despite these significant challenges, the project governance structure proved robust, and the remaining partner supports allowed us to adapt and make excellent progress toward our Goals and Objectives.

The successful completion of the DRAGEN Lab provided a base from which to coordinate activities, even during university shutdown. During this time, project leadership received special permission for our executive team to continue to operate in the Lab space and to complete the acquisition of research tools and technologies. Consequently, the DRAGEN Lab opened on schedule.

Throughout the pandemic, all other teams shifted to remote collaborations and implemented structured reporting systems that allowed the Project Director (PD), Project Manager (PM), and Research Facilitator (RF) to track progress. While every project remained limited by lack of physical access during the pandemic, work proceeded largely as planned or, in some cases, as re-planned.

The successful development of a prototype pedagogical video game (O4) was the result of monthly team meetings between researchers at several institutions in Canada and the UK. As noted above, it was not, until now, possible to test the game in local classrooms due to limitations on the part of our school board partner. Game testing, however, is now proceeding as planned.

Limited travel opportunities allowed us to reconsider the budget and reallocate some funds to enhance other objectives. Since we were unable to offer an in-person Archaeology Field School at Herstmonceux in 2020 or 2021, funds budgeted for HQP travel and training were redirected to a new co-investigator and partner working on O3. The team at Swansea, in collaboration with Oxford University, analyzed a significant collection of historical tree ring samples from southeast England. Over the past two years, they have begun to publish their dendroclimatological findings. The cost associated with this type of lab work is high and was only possible due to reduced HQP travel opportunities.

At the same time, we worked to protect the focus on HQP training. Although we had hoped, by this time, to have offered some 200 opportunities, despite pandemic restrictions, we have still offered 132. This required adaptation. In 2020, for example, although we could not offer an in-person archaeology field school at Herstmonceux, we hired a local archaeologist to offer a synchronous virtual school to Canadian HQP. Similarly, while we could not send HQP to work with our new partner, the Kent County Council (KCC), we developed projects that HQP could complete remotely. This led to the production of a first white paper and has now led to two more HQP placement opportunities with KCC.

As soon as travel resumed in summer 2022, we worked quickly to develop an expanded Archaeology Field School with our partner, the Bader International Study Centre, now Bader College (BC). We received support in this endeavour from two new partners: the Toronto Metropolitan University's Digital Media program and the Bexhill Museum. In May and June 2022, we deployed 21 students who worked on two teams. In September 2022, moreover, to compensate for the lack of HQP field opportunities in Years 1–3, we developed and launched a field experience through co-investigator Dr. Joan Coutu (Waterloo). This experience sends 20 Waterloo students to Sussex in February 2023.

In our application, we had envisioned a repository used by all team members and accessible to the public; technological circumstances, however, have evolved. Over the first three years, team members discussed a range of options and explored various technologies to support an open-access repository. Since 2019, there has been a significant shift away from project servers and toward cloud-based collaborative platforms like Dropbox, Teams, Sharepoint, and OneDrive. After due consideration, the PI and governance committee, in consultation with partner ETCL, determined that the best way to ensure open access to work product was through the Canadian-based Humanities and Social Sciences (HSS) Commons initiative. Last year, team members began integrating work product into a dedicated HSS Commons repository (**see Figure 3**). Over the coming years, we expect that the HSS

Project Response:

Commons will grow and provide a lasting repository for a range of outputs. The HSS Commons both provides access to finished products, typically in the form of published articles, papers, conference proceedings, and so on, and has the capacity to retain process work.

Since our project prioritizes the development of transposable methodologies, it is important for us to show how a diverse team of collaborators can develop a common vocabulary and move toward a complex goal. Throughout the development of O4, therefore, we have been tracking our work through a closed Wiki, which now contains an archive of our process work and prototypes. While the Wiki is currently closed to members of the public, upon completion of O4, we will link it to the HSS Commons and make it accessible publicly to show how we were able to coordinate work between computer programmers, game designers, geologists, archaeologists, historians, and teachers.

Taken together, the implementation of the HSS Commons and the integration of online repositories like the video game Wiki help us fulfill our original commitment to sharing our work product with others.

Midterm Review Committee Feedback: Choose a descriptor.

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2) Knowledge mobilization activities are proceeding and evolving as planned or, if not, the partnership has overcome challenges and adjusted plans appropriately and effectively to keep the project on track.

Provide links to the project's website and/or any social media:

https://www.medieval-environment.com/

https://www.dragenlab.ca/

https://www.instagram.com/dragenlab/

https://twitter.com/environofchange

Refer to SSHRC's Guidelines for Effective Knowledge Mobilization for examples of effective knowledge mobilization activities.

Describe the knowledge mobilization activities and events that have been accomplished to date as a direct result of the Partnership Grant and the extent to which your project is meeting the measures of success as outlined in your application and/or Milestone Report. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvement related to knowledge mobilization, describe how this feedback has been addressed. If you have experienced challenges, describe them and how they have been addressed. If you have adjusted your plans, explain and justify these changes. Finally, briefly outline your plans moving forward and describe how they will allow you to meet the goals and objectives of your project. You may wish to include, as an appendix, diagrams, charts or lists of publications that help to clarify your knowledge mobilization plans and that are tied to specific team members and objectives of the project.

Project Response:

With the continued support of the Council, we are proud to report that we have expanded our KM footprint significantly. In addition to a number of preliminary publications and conference presentations, our online presence is significant.

"Table 1: KMB Timeline by Year, Number, and Type" of our Stage 2 application laid out our preliminary KM plan. It is important to note that, due to the pandemic, the public CAMELOT conference we proposed in our Stage 2 application could not happen in summer 2020, 2021, or 2022. Team members did, however, continue to participate in conferences throughout these years, ensuring we met that KM commitment. The team, moreover, held an in-person AGM in 2019 and 2022, with virtual substitutes in between. The promised blog has been maintained on the project website, and our social media footprint is extensive. The pedagogical video game (O4), as noted, progresses well; we have noted the progress on the tourism app above; and we have explained how we are achieving our desired goal of digital artefact repositories. The acquisition of industrial 3D printers and 3D scanners for the DRAGEN Lab facilitates this work. Finally, publications continue as planned and work on the edited volume through Brepols is moving forward.

Beyond our initial Stage 2 KM plan, we have made other great strides. In 2020, we applied for and received a SSHRC Connection Grant to host a daylong symposium on climate and culture, *Disciplines in Dialogue* (**see Figure 4**). While the pandemic prevented this from happening as an in-person, we reconfigured our approach and instead have developed a series of three livestream webinars. Following the event, we edit the recordings into short videos and make them available [here](). The first of these online webinars occurred in September 2022. It focused on climate change and presented a three-way discussion between an early modern environmental historian (Sam White, Ohio State), a co-investigator (Maria Strack) who is the Canada Research Chair in Ecosystems and Climate, and a Minister of Parliament for the Green Party of Canada (Mike Morrice). Tracking of online engagement for this event reveals that 40,000 individuals viewed the abstract and poster, 15,000 Twitter users engaged the tweet, and over a hundred unique viewers participated in the live-stream discussion.

Our next online event matches a pre-eminent historian of health from Colby College (Dr. Jim Webb), the CEO of Public Health United and Immunologist at Johns Hopkins (Dr. Nina Martin), and Professor Emeritus of Molecular Biology and Immunology at Johns Hopkins (Dr. Clive Shiff). They will present on the theme of vector-borne diseases. A third event will occur in early 2023. We expect to increase our KM impact with each event.

Though the pandemic limited our ability to speak publicly or at scholarly conferences, team members continued to engage virtually in Years 2 and 3 and found innovative ways of disseminating findings to broad audiences. Co-investigator Jane Tingley (York University), for example, launched a highly successful art installation, *Foresta Inclusive* that presented digital visualizations of sounds gathered in real time for sensors attached to trees. In Year 4, co-investigator Dr. Simon Coppard, a biologist, builds on Tingley's artistic vision by gathering sensor data from trees in Sussex and Ontario through a novel software platform that allows the trees to live-Tweet observations on their sensory experience. This innovative social media "hook" is intended to draw attention to other aspects of *Environments of Change* that present scientific and historical proxy data from trees.

As soon as pandemic conditions allowed, we resumed participation in scholarly conferences and engaged HQP in that vital scholarly KM experience. Doctoral student Erin Kurian served as in-person liaison at the [2022 International Medieval Congress held at Leeds]() in June. There, the project PI and co-investigator Geneviève Dumas presented findings virtually. During the pandemic, in May 2021, the PI, the RF, and two co-investigators (MacDonald and Slavin), presented papers virtually on a panel they organized at the 56th International Congress on Medieval Studies, Kalamazoo, entitled "Environments of Change: Late Medieval Landscapes, Communities, and Health."

Scholarly publications remain on-track and are monitored by the executive team. The co-authored article by the PI and the RF that appeared in *Speculum: the Journal of the Medieval Academy of America*, the top journal in the field of Medieval Studies, indicates the publication standard established for the broader project. Additionally, team members have begun to publish collaboratively and across disciplines, as demonstrated by the forthcoming

> **Project Response:**
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> chapter co-authored by the PI, the RF, and several co-investigators (MacDonald, Graham, and Harrap). A number of drafted articles push the boundaries of interdisciplinarity, including "Understanding Space Usage and Interaction in Museums" and "Beyond Preservation: Multisensory Interaction for a More Immersive User Experience." The HSS Commons attests to the excellent publication track record, despite pandemic limitations (i.e. inability to travel; closure of libraries; loss of access to archives). We also have an edited volume on the various *EoC* projects accepted by Brepols. We expect to increase publications in Years 5, 6, and 7.

Has your project involved any of the following methods of knowledge mobilization? Select all that apply.

☒ Academic dissemination (*essentially, a one-way flow to other scholars in or near your field(s) of research*)

☒ Knowledge transfer (*transferring knowledge to scholars in other fields of research*)

☒ Knowledge translation (*writing or presenting research findings in more readable or useable forms e.g., writing for a wider or more diverse public*)

☒ Knowledge exchange (*exchanging or sharing knowledge with other disciplines or across sectors (two-way flow) e.g., workshop or conference*)

☒ Knowledge brokering (*facilitating the flow of knowledge between others*)

☒ Knowledge synthesis (*pulling together existing research in a useful form for other researchers or organizations*)

☒ Co-production (*building research teams or alliances that generate new knowledge based on an ongoing exchange of knowledge*)

☒ Networking (*organizing ongoing networks of scholars and/or other experts to mobilize knowledge*)

How many research products (including those under submission) have resulted directly from the Partnership Grant? You may append a list of publications tied to specific team members and objectives to help demonstrate the direct link to the project.

Products	Number Planned (in Milestone Report)	Number Developed	Number Planned (for second half)
Presentations	28	10	14
Interviews (broadcast or text)	2	0	2
Peer-reviewed journal articles (open access)	22	20	15
Peer-reviewed journal articles (subscription based)	0	2	2
Edited journal issues	0	0	0
Books (including edited books)	0	0	1
Book chapters	0	5	2
Entries (dictionary and encyclopedia)	0	0	0

Products	Number Planned (in Milestone Report)	Number Developed	Number Planned (for second half)
Conference publications	0	0	0
Articles in popular media	14	2	12
Reports, briefs, and other forms of grey literature	0	2	2
Artistic performances	4	1	1
Other (specify: Research/digital tools:	21	10	0
Educational aids:	4	9	0
New courses:	6	4	2

List the number of knowledge mobilization events that occurred directly as a result of the grant.

Event	Number Planned (in Milestone Report)	Number Developed	Number Planned (for second half)
Conference	0	0	0
Workshop	0	1	3
Summer institute	0	2	3
Media events (such as television/radio presentations)	0	0	0
Public debates	0	1	1
Other (specify: Written presentations)	9	10	10

Midterm Review Committee Feedback:	Choose a descriptor.
Click here to enter text.	

3) Training and mentoring commitments have been executed and projected as planned or, if not, the changes are well justified and appropriate.

Refer to SSHRC's Guidelines for Effective Research Training for examples of effective research training activities.

With respect to the project's training and mentoring activities, explain your accomplishments to date and the extent to which your project is meeting the measures of success as outlined in your application and/or Milestone Report. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvement related to training and mentoring, describe how this feedback has been addressed. Describe progress made to date in the training and/or development of research or support staff. Explain the expected degree of participation of the research staff (students, specialists, individuals from partner organizations and others) to be expected by the end of the project.

If you have experienced challenges, describe them and how they have been addressed. If you have adjusted your plans, explain and justify these changes. Briefly outline your plans moving forward and describe how they will allow you to meet the goals and objectives of your project.

Project Response:

HQP formation lies at the heart of *Environments of Change* and we are pleased to have trained a high number of young scholars, the next generation of digitally-minded investigators focused on historical issues of natural environment. At our inaugural Annual General Meeting, held in Waterloo in October 2019, we established a Student Caucus, to empower HQP and give them a voice in project leadership, research, and training opportunities. The student caucus remains a developing resource and one challenge that it faces is constant turn-over. Nevertheless, at our 2022 AGM at Herstmonceux Castle, the students met in a Special Session to contemplate new initiatives that could assist with continuity (**see Figure 5**).

HQP opportunities have included, but are not limited to: experiential learning at archaeological sites; training in 3D scanning and printing; mentored archival research; knowledge mobilization in the form of conference organization and presentations; lidar scanning of research sites; training in digital humanities tools and methodologies (in collaboration with Partner the DHSI); sedimentological analysis of project research sites; computer programming and video game development; historical-ecological research of sites of interest. As proposed in the PG application, HQP opportunities are based on a scaffolded approach to teaching and learning; graduate students with experience and expertise provide support to undergraduate learners operating in their fields of study, and faculty and other experts provide the guidance, expertise, and pedagogical frameworks for these pursuits. These opportunities allow HQP to learn and dialogue within and across disciplines, to network with individuals within and beyond their fields, and to develop academic and professional skills to support both their own interests and the interests of the project.

Distribution of individual HQP by level:

- Undergraduate: 35
- Master's: 35
- PhD: 10
- Postdoc: 2

Distribution of HQP opportunities by year:

- 2019-2020: 37
- 2020-2021: 24
- 2021-2022: 20
- 2022-2023: 41*

Distribution of HQP opportunities by level and year:

	2019-2020	2020-2021	2021-2022	2022-2023*
Undergraduate	17	12	5	16
Master's	15	8	10	18
PhD	5	4	4	4
Postdoc	0	0	1	2

* Please note that we are only halfway through this fiscal year

HQP play a vital role in helping us mobilize knowledge, deploying their combined historical and technological skills with great impact. For example, former MA candidate and current doctoral candidate Erin Kurian has prepared animated videos we have displayed at museum spaces in the UK and Canada, and online. These short animated

videos present to a popular audience topic such as medieval climate change and the Medieval Climate Optimum. Another of these videos, on medieval urban waste management, was a finalist in the 2021 GRADFlix competition.

Finally, it is important to note that the Host Institution and Partners continue to make a significant investment in HQP formation. Though, for most of the first half of the project, the pandemic prevented in-person placements with industry partners, industry support remains strong. So, for example, in April 2022, with the resumption of our in-person field school, St. Jerome's University released $47,250 in travel funds to support HQP. The previous year, during the pandemic lockdown, the Faculty of Arts at the University of Waterloo provided an additional $40,500 in graduate scholarships to support project HQP (Jacqueline Gergal, Erin Kurian, Zac Kachuck, Andrew Moore). Major investments such as these are not reflected in the SSHRC figures, which capture only grant funds. Although SSHRC only requires that we secure 35% in additional resources during the life of the grant, we secured a match of 261% in cash and kind. So generous is the funding we receive from partners and the Host Institution to train HQP and provide research spaces for them, moreover, that we received more than the total required project match in Year 1 alone.

How many students, postdoctoral researchers and/or non-students, respectively, have participated in your project?

Student Level	Number supported by SSHRC grant		Number supported by host and/or partner contributions	
	Canadian	Foreign	Canadian	Foreign
Undergraduate students	24	1	30	0
Master's students	30	4	21	0
Doctoral students	9	1	10	0
Postdoctoral researchers	1	1	0	0
College students	0	0	0	0
Other (e.g., technician, professional research associate)	7	0	0	0
Total Number	72	6	61	0

Please note that several students have received support from both SSHRC funds and host/partner contributions, and thus have been counted in both categories.

Indicate, if applicable, the kinds of activities in which students and/or postdoctoral researchers, supported by the SSHRC grant, have been engaged as part of this initiative. Select all that apply.

Activities	Undergraduate students	Master's students	Doctoral students	Postdoctoral researchers	College Students
Data collection	☒	☒	☒	☒	☐
Data entry	☒	☒	☒	☒	☐
Data analysis and literature review	☒	☒	☒	☒	☐
Communications (e.g., lecturing or presenting at conferences)	☒	☒	☒	☒	☐
Mentoring	☐	☒	☒	☒	☐
Networking and collaborations	☒	☒	☒	☒	☐
Outreach activities	☒	☒	☒	☒	☐
Participation in publications	☒	☒	☒	☒	☐
Project Design	☒	☒	☒	☒	☐
Report writing/editing	☐	☒	☒	☒	☐
Teaching (including pedagogy and/or educational training).	☐	☒	☒	☒	☐
Internships or other activities in the business, not-for profit or government sectors	☒	☒	☒	☐	☐
Activities that provide international experience	☒	☒	☒	☒	☐
Other (specify: Click here to enter text.)	☐	☐	☐	☐	☐

Midterm Review Committee Feedback: Choose a descriptor.
Click here to enter text.

4) Governance and management structure is functional and appropriate

Start this section by identifying any changes (i.e., additions, withdrawals or removals) in the project team and/or partner organizations from the start of the project and offer a brief justification for these changes.

Briefly describe the management and governance approaches and structures of the partnership, including details about how the partnership is organized (e.g. working groups, clusters, teams, etc.). List the research and/or related activities or sub-projects associated with each grouping within the partnership, as appropriate. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvements related to governance, describe how this feedback has been addressed.

Assess the effectiveness of these structures and approaches employed by the partnership (e.g., approaches to communication, decision-making, conflict resolution, etc.). Highlight the successes that have been facilitated by the project's structure and identify challenges that have been encountered. If the structure has changed over the duration of the project, explain and justify these changes.

Project Response:

Our project began with a robust governance structure that has served us well. For ease of reference, we replicate the proposed governance structure contained in our Stage 2 application in the appendix (**see Figure 6**). Changes to that planned governance structure occurred primarily to those areas of the chart coloured green. First, in terms of the Steering Committee, we maintained the Industry Reps, Queen's University Rep, and HQP Reps, but modified the Team Coordinators. As we worked, the role we had imagined Team Coordinators could play evolved into more project-centred roles, as opposed to umbrella clusters. This aligns more closely with our Objectives. Rather than have a team devoted to "physical evidence" (originally construed as T2), to monitor all aspects of materiality running across all sub-projects, we find it more practical to have, say, our archaeology leader report on all archaeology-related activities and our digital scanning leader report on physical artefacts managed through his project. Simply put, because of the multi-faceted nature of the research projects that fall under our broader project, it was overly ambitious to assume that one team leader could maintain an intimate awareness at an operational level of many projects. It is, therefore, more effective to have project leaders report up individually, and then for the senior leadership team to distill and disseminate information back down through the project. Another change is that much of the committee work originally ascribed to sub-committees has fallen directly under the office of the Project Manager, who directs team members as necessary. So, for example, the PD and PM undertook an equity review that led to the creation of an endowed scholarship for Black and Indigenous students in the DRAGEN Lab and the establishment of a formal partnership with Anishnabeg Outreach and the Royal Ontario Museum. In developing these initiatives, the PD and PM reported directly to project members at the AGMs, received feedback through workshops, and then maintained good communications with all stakeholders. The PD and PM adopted similar models for Finance, Data Management, KM, Partner Expansion, and Risk Management.

Our team has grown considerably. In Year 1, co-investigator Dr. Laura Cameron withdrew from the project and collaborator Christopher Whittick retired from his position with Partner ESCC. Whittick has continued his work as a technician. Otherwise, we have added a considerable number of collaborators and co-investigators, notably Dr. Neil Loader at Swansea University. New partners include Anishnabeg Outreach, the Royal Ontario Museum, the High Weald Area of Natural Beauty, and the Kent County Council (KCC). We are currently formalizing MOUs with York University and Toronto Metropolitan University. Because the pandemic prevented HQP placement at Partner UbiSoft, we have yet to engage HQP training through that relationship. Similarly, private schools VOICE Integrated and KWBS were, until now, unable to receive HQP placements to test O4. Partner WRDSB, despite being unable to provide game-testing for O4, has made a continual investment in the form of teacher liaisons and access to Board experts. Partner Nelson Publishing was always intended to be engaged in the second half of the project and that plan remains intact. Core partners remain the University of Waterloo, St. Jerome's University, Queen's University, Bader College, Brock University, WRDSB, and KCC.

We have listed above the various projects and deliverables associated with Environments of Change.

The governance structure is effective and serves the project well. All stakeholders review governance at the Annual General Meeting and we have found that, throughout the year, weekly and monthly meetings of sub-teams, continual updates on social media and the project website, scheduled sub-project workshops, and the publication of an Annual Report all ensure smooth operations.

Midterm Review Committee Feedback:	Choose a descriptor.
Click here to enter text.	

5) Partner organizations are engaged in the project.

Assess the extent to which the partnership structures have facilitated partner engagement and describe how partner organizations are contributing to project activities. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvements related to partner engagement, describe how this feedback has been addressed. If partner engagement could be improved, provide a strategy or plan to further engage partners moving forward. You may wish to include, as an appendix, diagrams or charts that help to clarify your governance and management structures.

Project Response:

The partnership structure has been essential to our progress. The pandemic severely limited access to corporate partners, like UbiSoft, which had planned to train HQP in job-placement opportunities, and to all overseas (British) partners; however, our research, KM, and HQP outputs remain strong because we adapted. For example, while it was impossible for Partner Bader College to host our annual field school in Years 2 or 3, we developed instead a virtual field school in Year 2 and, in Year 4, expanded the field school to encompass a wider range of training opportunities. Likewise, as soon as international travel became a possibility, Bader College hosted the project AGM in April 2022 and provided generous lodging, meeting space, transportation, and access to support staff and British research sites. Similarly, as noted above, while Partner WRDSB could not allow our experts and HQP to enter their classrooms to test our video game due to pandemic restrictions, WRDSB instead provided dedicated staff time in the DRAGEN Lab to consult on pedagogical development of that digital output. Likewise, although Partner ETCL was unable to offer in-person training through their Digital Humanities Summer School, they instead provided online training to our team each summer and developed the project's HSS Commons. In the UK, Partner KCC created several remote positions for HQP, allowing Canadian students the opportunity to work with a branch of UK government and ultimately to produce a series of white papers on cultural asset management and climate change. Partner Brock University lost access to UK tourism sites, but Brock co-investigator Dr. David Brown and his graduate HQP nevertheless developed a series of Google-based tours at Herstmonceux. So, in large part, we collaborated with partners to find creative ways to pursue our mutual goals and objectives.

In the case of Nelson Publishing, a founding partner, it was always the intention that this partnership would activate in the second half of the project, as we prepare to publish pedagogical tools.

In terms of matching partner funds, it seems important to note that we exceeded the minimum total project match immediately in Year 1. The continued partner contributions from which we benefit have, since that point, been in excess of the minimum required by the grant parameters.

Midterm Review Committee Feedback:	Choose a descriptor.
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6) The host institution and partner organizations are largely meeting their commitments, and the project is on track to secure the 35% cash and in-kind contribution requirement.

This criterion will primarily be assessed based on the partner contribution workbook that is submitted to SSHRC each year. As this workbook is quite detailed, only describe partner and host contributions in high-level, general terms.

Identify the extent to which the commitments made in the Formal application have been met by the host institution, partner organizations and supporting organizations. Highlight any anticipated shortfalls or additional support and their impacts on project plans. If contributions are not on track to meet SSHRC's 35% minimum requirement, describe any plans or actions being undertaken to obtain additional contributions. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvement related to contributions, describe how this feedback has been addressed.

Project Response:

As noted above, we exceeded the total required project contributions in Year 1. We submitted the required documentation to SSHRC at the end of Year 1.

Midterm Review Committee Feedback: Choose a descriptor.

Click here to enter text.

7) Budget allocations are projected as initially planned or, if not, the changes are well justified and appropriate.

Provide details on budget allocations in the first half of the project and explain any significant changes from the proposed budget in the original application. Also provide a detailed budget justification for the remaining period of the project, highlighting any significant changes from the initial application and/or Milestone Report. Amounts should correspond with the tables below. If the expert panel and/or the adjudication committee at the Formal application stage raised concerns or made suggestions for improvements related to the budget, describe how this feedback has been addressed.

Project Response:

As noted above, the restrictions that COVID-19 placed on travel and in-person training opportunities meant that the project had to revise its proposed activities for Years 2 and 3. This required a reformulation of the Stage 2 budget and a redistribution of funds to support opportunities that both advanced the project's Goal and Objectives and that could be engaged remotely.

Activity in Years 2 and 3 centred around the various subprojects noted above. The Governance Committee disbursed the funds required for these activities as sub-awards to project co-investigators, who then administered them according to their approved budgets. In some cases, funds were disbursed before the effects of pandemic restrictions could be anticipated. This is the case for the postdoctoral funding for Year 2, which, as note 3 indicates, was disbursed but ultimately postponed. In the table below, the funds disbursed as sub-awards have been accounted within the line items they supported. As the table illustrates, the majority of funds supported student salaries/training, though the distribution of these funds deviated from the budget proposed during the application stage of the project.

Project Response:

The values recorded under "Seed Funding" account the funds disbursed to project co-investigator Dr. Neil Loader to support the dendroclimatological work he is supervising at Oxford and Swansea University. Although these funds operate like the other sub-awards, we have captured them as seed funding, given the restrictions of the report table. In this instance, the bulk of the funding went to cover high laboratory costs and Dr. Loader's HQP salaries.

Outside of the expected underspending on travel, the most notable discrepancy between the budget proposed during the application and the actual expenses for Years 1-3 can be seen in the distribution of HQP funding. The majority of the proposed undergraduate opportunities were experiential and required in-person participation. Since this was not possible for much of 2020 and 2021, funds were redistributed to remote masters and doctoral students who had the skills and knowledge base to support the subprojects that became of the focus of these years.

Very little of the SSHRC funds have been allocated to computer equipment and supplies, despite an initial and significant financial obstacle. Due to a miscommunication between the Tri-Council and the Canada Fund for Innovation (CFI), the project did not receive the anticipated support from JELF for infrastructure in the DRAGEN Lab. To ensure that the DRAGEN Lab could operate as required, as a space for collaboration, coordination, and production, the University of Waterloo's Office of Research established a $400,000 Research Support Fund for infrastructure and technology.

Please note that the two sample Annual Reports appended to this report capture overall spending, which combined SSHRC funds and matching funds.

7a) Actual Expenses in the first half of the project.

Complete the budget table below for the first half of your project. The categories are based on the original application and this section should show how SSHRC funds were used in the first half of the grant. Any significant deviations must be justified in the text box above (e.g. changes in allocation of funds dedicated to students).

Budget categories		Actual Expenses		
		Year 1	Year 2	Year 3*
Students' salaries and benefits/stipends	Undergraduate	29,339.39	79,543.22	28,031.01
	Masters	52,404.45	76,458.04	62,183.33
	Doctorate	25,893	54,099.93	54,821
Non-student salaries and benefits/stipends	Postdoctoral	0	45,000[4]	32,000
	Other[1]	60,689.37	25,181.88	54,062.74
Travel and subsistence costs	Participants – Canadian travel	7,706.31	250.50	0
	Participants – Foreign travel	29,412.08	0	8,617.84
	Students – Canadian travel	1,510.31	0	0
	Students – Foreign travel	14,689.83	0	9,512.52
Other expenses	Professional/Technical services	7,724	1,427.09	4,647.41
	Supplies[2]	3,270.11	2,371.65	4,474.25
Non-disposable equipment	Computer hardware	9,412.82	11,388.47	4,326.51
	Other[3]	2,268.31	5,012.91	5,119.16
Other expenses (specify)	Hospitality	3,341.45	161.96	255.28
	Seed funding	0	129,211.95	26,816.98
	Memberships / conference fees	982.18	236.95	730.36

Budget categories	Actual Expenses		
	Year 1	Year 2	Year 3*
Total	248,643.61	430,344.55	295,598.39

* For 5 year projects, please include both the actual and projected expenses for year 3.

[1] Includes Project Manager's salary; Year 1 also includes the salary for a part-time pedagogical consultant, a recently-graduated MA and BEd HQP whose degree formation ended as the project was beginning
[2] Includes books and periodicals
[3] Includes software subscriptions
[4] Disbursed as a sub-award, but postponed due to COVID-19 restrictions

7b) projected expenses for the remainder of the project.

Complete the budget table below for the remaining years of your project (i.e. for 5 year projects complete years 4-5, for 6 year projects complete years 4-6, and for 7 year projects complete years 5-7). The categories are based on the original application and should account for the use of SSHRC funds for the remaining years of the project.

Budget categories		Projected Expenses			
		Year 4	Year 5	Year 6	Year 7
Students salaries and benefits/stipends	Undergraduate	60,000	60,000	60,000	60,000
	Masters	60,179	60,179	60,179	60,179
	Doctorate	79,968	79,968	79,968	79,968
Non-student salaries and benefits/stipends	Postdoctoral	44,800	44,800	44,800	44,800
	Other	41,309	41,309	41,309	41,309
Travel and subsistence costs	Participants – Canadian travel	14,301	14,301	14,301	14,301
	Participants – Foreign travel	23,158	23,158	23,158	23,158
	Students – Canadian travel	13,000	13,000	13,000	13,000
	Students – Foreign travel	20,000	20,000	20,000	20,000
Other expenses	Professional/Technical services	0	0	0	0
	Supplies	0	0	0	0
Non-disposable equipment	Computer hardware	11,000	11,000	11,000	11,000
	Other	0			
Other expenses (specify)	Open access fees	17,011	17,011	17,011	17,011
	Seed project funding	15,000	15,000	15,000	15,000
Total		399,726	399,726	399,726	399,726

60, 0000 – undergraduate; add

Midterm Review Committee Feedback: Choose a descriptor.

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