
Waterfowl Travel: Team Iteration 1 Report



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Prepared by the students of CSC 4610 – Fall 2024

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Stories Identified:

Author: Revel Etheridge, Drew Burkhalter, Kenny Adams

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

- **[K] Spike Waterfowl Research:** The team was tasked with learning more about ducks and their migration patterns so we would have some level of understanding for the data we were supposed to be processing. Each member was assigned a specific research paper to read through and once they understood they presented the paper to other members of the team in order to clarify it. Additionally, Dr. Cohen gave a description of the data's meaning in relation to ducks and put it in terms computer programmers would understand. These methods allowed the team to understand the data they were given and filter the data to what was necessary to them.
- **Spike Coding Language-** The team is tasked with learning and familiarizing themselves with 3 programming languages. The first is R so we can smoothly interrupt all our data for our map. The second language is going to be JavaScript so that we can have our migratory map run smoothly along with any other front-end development we need to do. The final language is going to be Python for our back-end development.
- **[K] Spike Movebank Repository:** Jacob and Breanna were chiefly responsible for the use of Movebank which was where the data for the duck's migration patterns were stored. They had to learn how to access the Movebank website and search for the specific data the team needs. After locating the data on the website another challenge was the breadth of the data downloaded which posed a challenge when trying to sort through it in R in a timely manner. Breanna was eventually able to create a program that sorted through the data that took around 15 minutes. Now that there is a basic understanding of how to handle this large quantity of data we hope to improve its response time.
- **Spike GitHub:** The team was tasked with learning and getting familiar with the basics of GitHub so that we can properly keep track of our code and user stories. Some of us had more experience than others and were able to help the other team members who are less familiar with the ins and outs of GitHub. Most of the team is now familiar with this and can effectively navigate and use it with some possible questions here and there.
- **[R] Spike UI Development:** The finished website will be used by a variety of users with varying experience and technical skill, and so the user interface should be clean, straightforward, and easy to navigate. The team was tasked with studying, practicing, and learning more about the creation and implementation of user interfaces in order to provide the best possible user experience.
- **[R] Spike Data Science and Machine Learning:** The main feature of the project is a ten-day prediction of waterfowl migration, which will require a sound and thorough foundation of data analysis and machine learning. The entire team, therefore, was tasked with furthering their understanding of both subjects to create a prediction algorithm that is as accurate and efficient as possible.
- **[R] Creating a Mockup:** For the sales pitch, our team wanted to create a mockup of the website we will be developing to ensure the client is happy with our application of his vision. The mockup will feature a home/landing page, a ten-day prediction of migration, toggles for covariates, a newsletter signup page, an about us section, and a learn more page. The team worked as a whole to create the blueprint for the homepage and from there, Revel and Drew built the rest of the website to match.
- **Manage website through GitHub:** For creating the website, the team ended up agreeing that it would be easiest for all of us to manage and build the website from within GitHub. This was a

decision that ended up making sense since we would already be storing a good chunk of this project on GitHub to begin with. Tania and Jacob were the ones who were tasked with getting the website set up through GitHub. Once completed they gave the whole group a detailed explanation of how this would work and made sure everyone understood.

- **[R] Spike Learning Wix:** The team was tasked with learning how to use Wix, a platform for web development so that we could visualize the goals, structure, organization, and format of our project. Wix was selected because of its simplicity, ease of use, and rough familiarity among developers.

Plan for next iteration:

Author: Kenny Adams

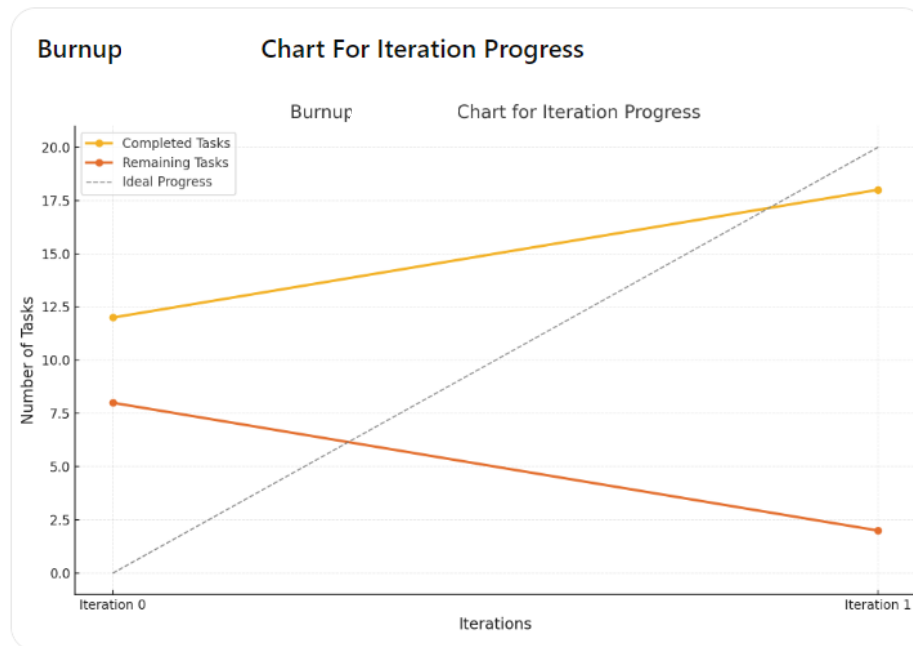
Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

Iteration 2 is the next iteration and will be the start of full development on the website instead of simple planning and making mockups. The first user story that will be tackled is creating a map that we will later be able to put markers on that represent the data of ducks. This task will be handled by Drew and Revel due to its necessity to be directly integrated with the website. The difficulty of this task will be how to integrate the R code with a map the user can interact with. The next user story will be the Automated Data Integration which will be handled by Breanna and will entail finding a way to format the massive amount of data into R. This will require figuring out a way to either sort through or delete the large movebank dataset to get the data we specifically need. Another user story is the real-time weather data integration which will be handled by Kenny. Preliminary steps were taken for this in the last iteration but will mainly be refined in this iteration. It will be necessary to pull weather data from an API that can be updated. This pulled data will be compared to the already acquired historical data and is necessary for the predictive algorithm. The final user story will be interactive websites functions which will be taken care of by Tania and Jacob. This step will involve backend development and have some overlap with Revel and Drew. The main challenge will be how to directly import the map from R using a program called “Leaflet”. With these user stories we hope to have the frame of the website completed and will be able to make a functioning app in future iterations.

Burnup Chart:

Author: Jacob Sullivan

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores



As the burnup chart shows, we picked up at 12 points coming out of iteration 0. The chart also shows that, as a team, we were able to almost keep up with the outlook of completing each story in the iteration. As in iteration 1, we had a few larger spikes which left us with one task, which was pushed to be completed during the break for all group members to pursue to keep up with the velocity of our progress. So, after we return from the break, we will be back on track with completing user stories within this iteration.

Retrospective Summary:

Author: Breanna Woosley

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

What Has Gone Well?

1. Completion of Core Tasks

- The majority of tasks for Iteration 1, such as creating project charters, skeleton mockups, and analyzing migration patterns in R, were successfully completed.
- This demonstrates strong team coordination and dedication.

2. Team Collaboration

- Team members actively collaborated on tasks, with multiple contributors working on efforts like researching and integrating the Movebank database schema.

3. Utilization of Tools

- a. Members became familiar with tools such as GitHub and R packages, leading to smoother task execution and better overall efficiency.

4. Clear Deliverables

- a. The creation of mockups and database schema spikes ensured that deliverables were well-defined and ready for the next development phase.

What Could Be Improved?**1. Task Completion Timing**

- a. Tasks like uploading R maps to the website and developing map interaction features are still in progress. This indicates a need for better time management or reallocation of resources.

2. Tool Proficiency

- a. While GitHub proficiency has improved, additional practice would help reduce bottlenecks and streamline task integration through version control.

What Questions Do You Have About the Project or Process?**1. Integration of Components**

- a. How will smaller components of the application integrate into a cohesive, functional system?
- b. Challenges include identifying the most suitable hosting solution, integrating the R program with a web-based platform like Wix, and ensuring component interoperability.

2. Machine Learning Algorithm Selection

- a. What machine learning algorithm (e.g., Random Forest, SVM, Neural Networks) best suits the project's data and objectives?
- b. How feasible is incorporating ensemble methods for improved prediction accuracy?

3. Database Size and Structure

- a. How can spatial data, particularly raster and geospatial formats, be stored and retrieved efficiently?

4. Data Handling and API Integration

- a. What is the best approach for developing APIs to enable communication between the front end and back end, especially for dynamically fetching data (e.g., from weather websites)?

5. Hosting and Deployment

- a. What hosting platform can support advanced functionality while accommodating Wix's limitations?

6. Visualization of Results

- a. What JavaScript libraries (e.g., D3.js, Leaflet) are best for effectively visualizing geospatial data, including heatmaps and migration route overlays?

What Action Items Need to Be Addressed?**1. Complete Pending Tasks**

- a. Prioritize completing tasks such as map uploading and user interaction features for R maps. *(Responsible Party: Development Team)*
- 2. Redistribute Workload**
 - a. Evenly distribute tasks among team members to prevent burnout and ensure timely completion. *(Responsible Party: Team Lead)*
- 3. Increase Sync-Ups**
 - a. Schedule more frequent team sync-ups to address blockers and challenges. *(Responsible Party: All Members)*
- 4. Emphasize Learning Opportunities**
 - a. Continue emphasizing tool and process training critical for project success. *(Responsible Party: Individual Team Members)*

Lessons Learned

- Focusing on spikes (e.g., research and tool familiarization) early on provided a strong foundation for development.
- Regular check-ins and progress updates are essential to identify and resolve bottlenecks.
- Incorporating feedback loops for mockups and deliverables ensures alignment with project goals.

Team Temperature:

Author: Tania Perdomo Flores

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

Spider chart along with a description and summary of our team's temperature.



Summary:

After the first iteration of this project, our spider diagram reflects strong performance across most categories. However, the scores for *Workload* and *Team Collaboration* were notably lower. These challenges

seem to stem from issues related to time management and task allocation. While the workload is generally distributed evenly among team members, there have been instances where incomplete tasks required others to step in, leading to some members taking on more work than originally assigned. While we recognize that unforeseen circumstances may arise, resulting in some team members being unable to complete their tasks, we have encountered situations where even smaller tasks remain unfinished. This has placed additional strain on others to compensate for the gaps, affecting both team collaboration and overall productivity. Moving forward, we aim to improve task accountability and ensure better completion of even smaller tasks to maintain a balanced workload and foster stronger team collaboration. On the other hand, Team Communication, Project Progress, and Stakeholder Engagement continue to have high scores. Our internal communication and progress have been strong, with team members maintaining a clear understanding of project goals. While we are still refining our ability to collaborate efficiently, we are steadily improving as a team. Our primary stakeholder, the client, has been excellent at maintaining regular communication and scheduling weekly meetings with the team. These interactions have been invaluable in refining project features and ensuring alignment on both features and user stories.

Showcase:

Author: Tania Perdomo Flores

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

At the end of this iteration, our team prepared a showcase of the effort completed. The showcase demonstrates the specific user stories completed during the iteration.

https://www.youtube.com/watch?v=S1nHbYmE_nA

Appendix:

Author: Jacob Sullivan

Contributors: Revel Etheridge, Drew Burkhalter, Jacob Sullivan, Kenny Adams, Breanna Woosley, Tania Perdomo Flores

- Kanban Board and GitHub
 - <https://github.com/users/JakeSul1023/projects/1/views/1> (Kanban Board GitHub)
 - https://github.com/JakeSul1023/Team-7_Waterfowl (Repository GitHub)