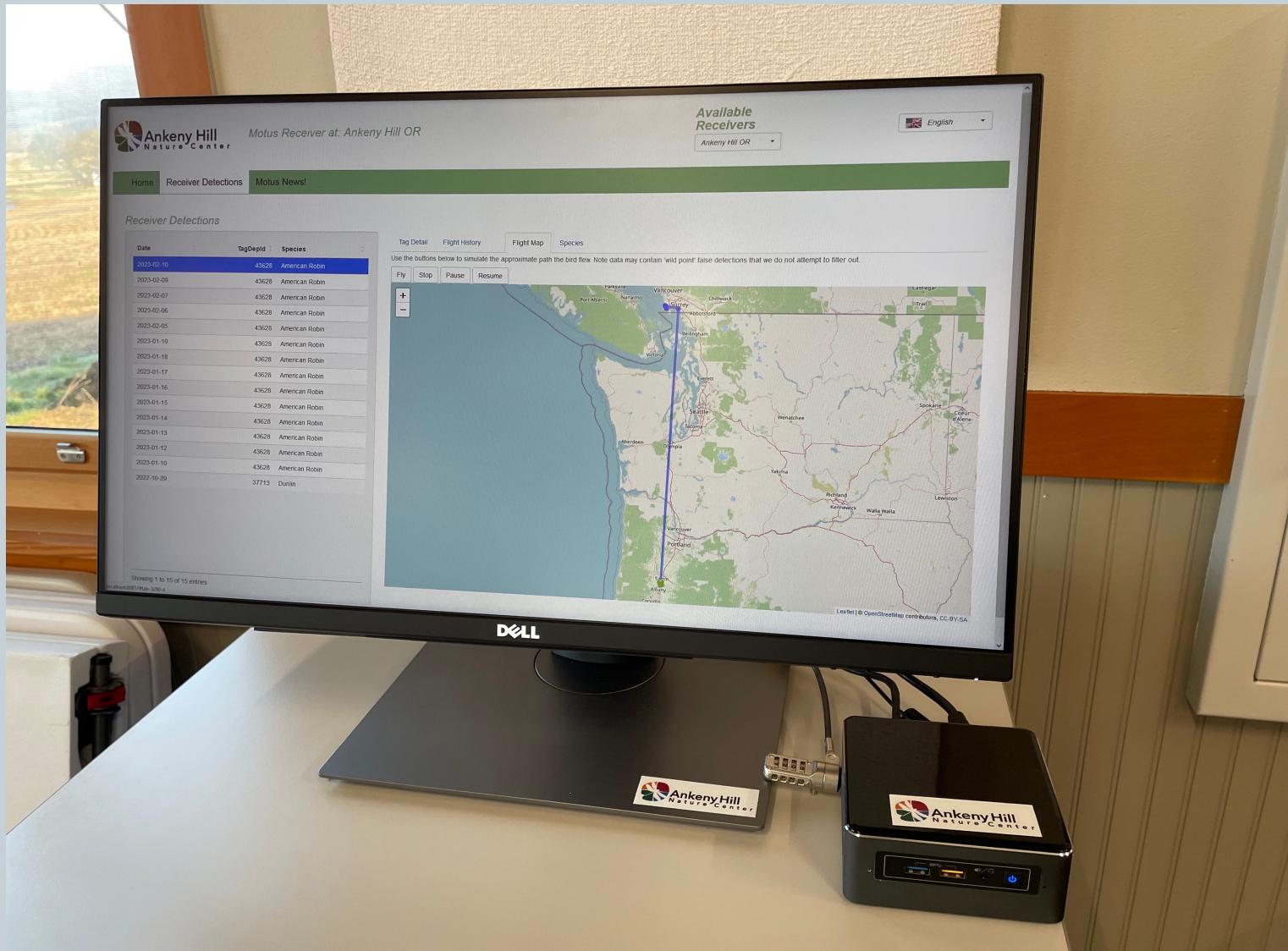


A Nature Center Kiosk for Motus Data

Rich Schramm – Volunteer at The USFWS Ankeny National Wildlife Refuge
schramm.r@gmail.com



The Ankeny Hill Nature Center

- Located on the Ankeny National Wildlife Refuge
- Indoor and outdoor classrooms, interpretive areas and trails.
- For use by educational organizations, community groups, non-profit organizations and refuge programs.



Credit: Mike Williams, Ankeny Hill Nature Center, Use by permission.

“The mission of the Ankeny Hill Nature Center is to provide educational and interpretive opportunities to connect people with nature.”

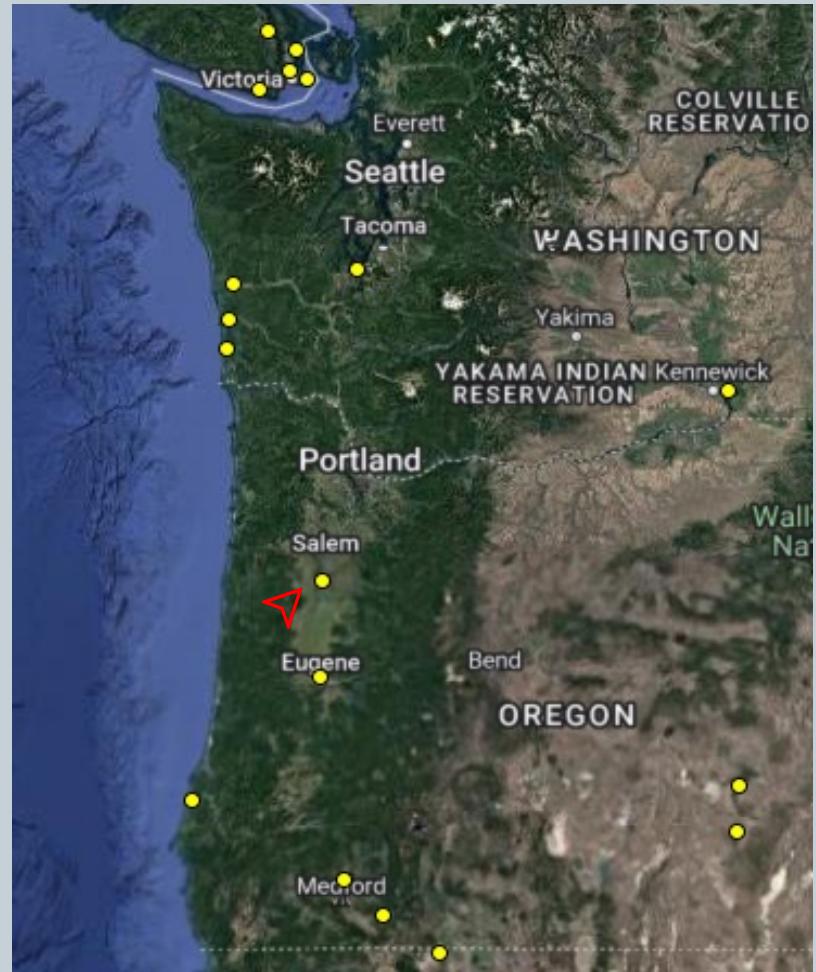
Our Motus Station



Made possible by a grant from **The Oregon Conservation & Recreation Fund** and the **Oregon Department of Fish and Wildlife** to the Salem Audubon Society.

Built with the support of:

USFWS Willamette Valley Wildlife Refuge Complex
The Ankeny Hill Nature Center
Salem Audubon Society
Friends of the Willamette Valley Wildlife Refuge Complex
USFWS Division of Migratory Bird Management



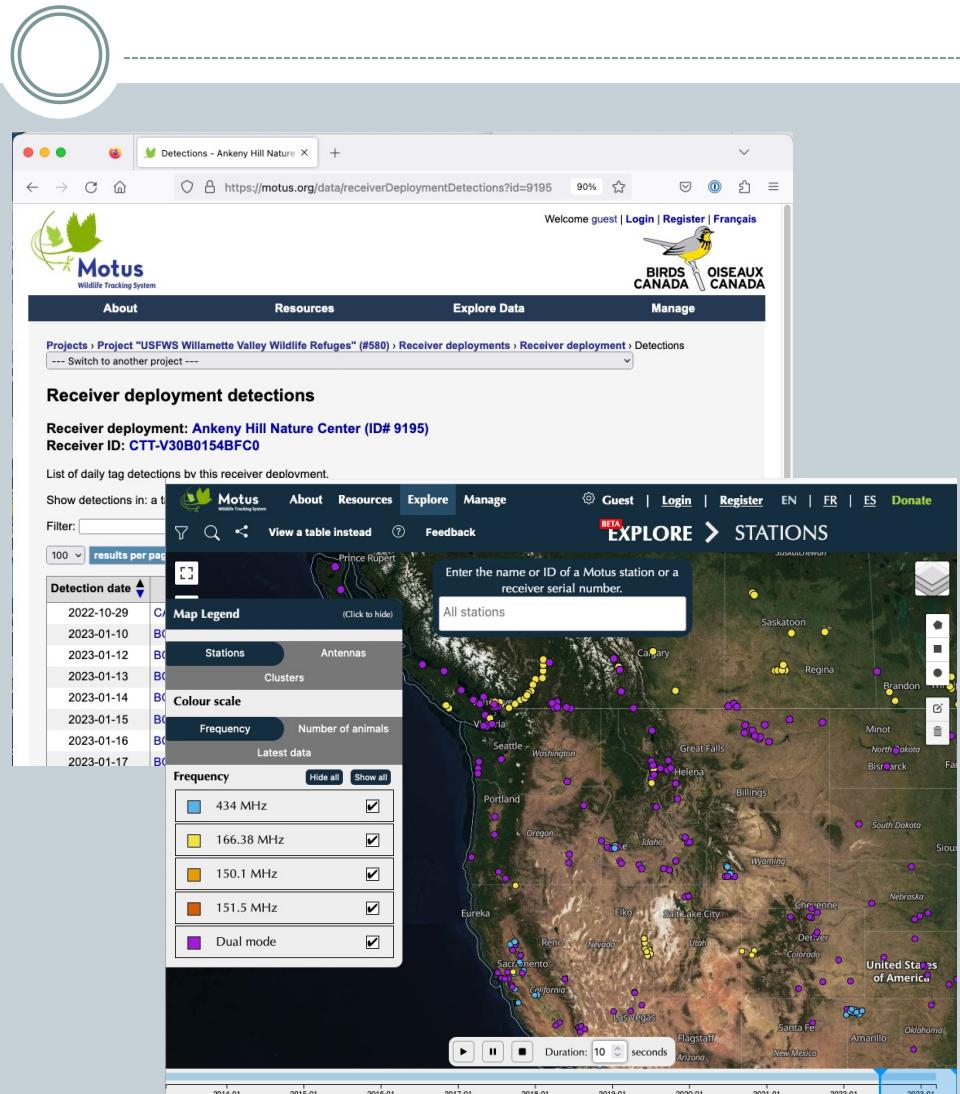
Why a kiosk?



- AHNC wanted to move beyond static interpretive signage to a friendly touchscreen interactive visitor interface.
- We tightly control the content we want them to see - no surprises or 'unintended uses'.
- Something engaging, easy to navigate with a limited number of choices.
- Something a young student or a child, teacher or grandparent can navigate.
- Show current live data specific to our nearby stations.

Other options considered

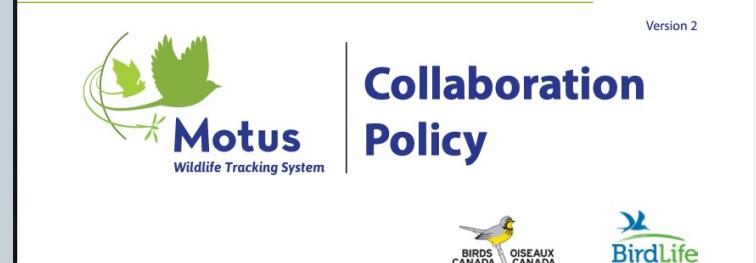
- Motus.org & Birds Canada already provides two fantastic, feature rich browser-based data access tools.
 - “Explore Data” interface
 - New “Motus Data Dashboard” (beta)
- Both require an investment of time to learn how to search for and navigate to projects, receivers, tags, and detections.
- A visiting public provides us a very limited time window to grab their attention.



Additional Requirements

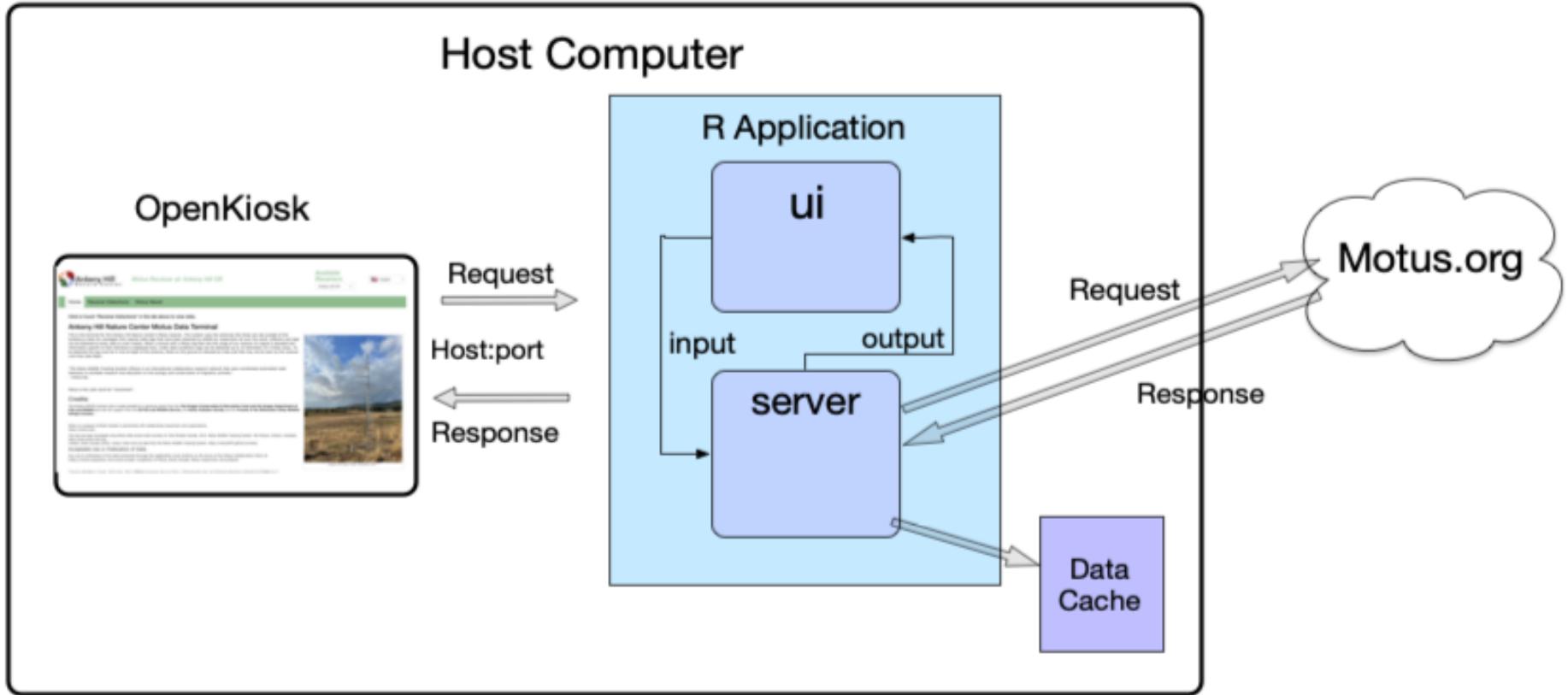


- Adhere to Motus Collaboration Policy presenting only Motus public ‘Summary Level’ data.
- Multi-language support.
- System boots directly into kiosk homepage.
- Prohibit users from accessing any login account , file system, system commands or settings.
- Low cost hardware and open-source tools, no monthly fees.
- No support staff needed on site.



2022 Collaboration Policy
<https://motus.org/policy/>

Ankeny Motus Kiosk



The kiosk app's server module fetches our Motus data when needed by the UI.



About

Resources

Explore Data

Manage

[Projects](#) › Project "USFWS Willamette Valley Wildlife Refuges" (#580) › [Receiver deployments](#) › [Receiver deployment](#) › Detections

--- Switch to another project ---

Receiver deployment detections

Receiver deployment: Ankeny Hill Nature Center (ID# 9195)

Receiver ID: CTT-V30B0154BFC0

List of daily tag detections by this receiver deployment.

Show detections in: a table | [a timeline](#)

Filter:

100

results per page

Detection date	Tag deployment	Species	Date deployed	Latitude	Longitude
2022-10-29	CA-Shorebirds#61662A4B:30 M.57962	Dunlin	2022-01-27	39.178	-122.0761
2023-01-10	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129
2023-01-12	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129
2023-01-13	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129
2023-01-14	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129
2023-01-15	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129
2023-01-16	BCwinter#62:19.1 M.71516	American Robin	2022-10-18	49.101081	-123.166129

This is what we see when we use [motus.org ‘Explore Data’](#)

```
700  </div>
711  </div>
712  <h2>Receiver deployment detections</h2>
713  <h3>
714  Receiver deployment: <a href='receiverDeployment?id=9195'>Ankeny Hill Nature Center (ID# 9195)</a><br>
715  Receiver ID: <a href='receiver?id=5382'>CTT-V30B0154BF0</a>
716  </h3>
717  <p>List of daily tag detections by this receiver deployment.</p>
718  <p>Show detections in: a table | <a href='receiver/deployment/detections/timeline?id=9195'>a timeline</a>
719  <form class=motus-table-search>
720  <label>Filter: <input type=search name=q value=' '></label>
721  <input type=hidden name=f value=1>
722  <input type=hidden name=n value=100>
723  <input type=hidden name=o value=0ala2a3a4a5a>
724  <input type=hidden name='id' value='9195'>
725  </form>
726  <form class=motus-table-page-size>
727  <select name=n>
728  <option value=25>25</option>
729  <option value=50>50</option>
730  <option value=100 selected>100</option>
731  <option value=1000>All</option>
732  </select>
733  <input type=hidden name=q value=' '>
734  <input type=hidden name=f value=1>
735  <input type=hidden name=o value=0ala2a3a4a5a>
736  <input type=hidden name='id' value='9195'>
737  <input type=submit value='results&#32;per&#32;page'>
738  </form><pre class=motus-table-page-links></pre>
739  <table class=motus-table>
740  <thead>
741  <tr>
742  <th>Detection date <div class=motus-table-sort-controls><div>▲</div></div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
743  <th>Tag deployment <div class=motus-table-sort-controls><div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
744  <th>Species <div class=motus-table-sort-controls><div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
745  <th>Date deployed <div class=motus-table-sort-controls><div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
746  <th>Latitude <div class=motus-table-sort-controls><div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
747  <th>Longitude <div class=motus-table-sort-controls><div><a href='?q=&#61;id=&#61;9195&f=&#61;1&amp;n=&#61;100'>
748  </tr>
749  </thead>
750  <tbody>
751  <tr>
752  <td>2022-10-29</td>
753  <td><a href='tagDeployment?id=37713'>CA-Shorebirds#61662A4B:30 M.57962</a></td>
754  <td>Dunlin</td>
755  <td>2022-01-27</td>
756  <td>39.178</td>
757  <td>-122.0761</td>
758  </tr>
759  <tr>
760  <td>2023-01-10</td>
761  <td><a href='tagDeployment?id=43628'>BCwinter#62:19.1 M.71516</a></td>
762  </tr>
```

This is what the browser ‘sees’ as the same response in HTML



Receiver Detections

Date	TagDepID	Species
2023-02-10	43628	American Robin
2023-02-09	43628	American Robin
2023-02-07	43628	American Robin
2023-02-06	43628	American Robin
2023-02-05	43628	American Robin
2023-01-19	43628	American Robin
2023-01-18	43628	American Robin
2023-01-17	43628	American Robin
2023-01-16	43628	American Robin
2023-01-15	43628	American Robin
2023-01-14	43628	American Robin
2023-01-13	43628	American Robin
2023-01-12	43628	American Robin
2023-01-10	43628	American Robin
2022-10-29	37713	Dunlin

	date	site	lat	lon	receiverDeploymentID
1	2022-10-18	Alaksen	49.1	-123.17	8415
32	2022-10-18	Tagged	49.10108	-123.16613	0
2	2022-10-19	Alaksen	49.1	-123.17	8415
3	2022-10-20	Alaksen	49.1	-123.17	8415
4	2022-10-21	Alaksen	49.1	-123.17	8415
5	2022-10-22	Alaksen	49.1	-123.17	8415
6	2022-10-23	Alaksen	49.1	-123.17	8415
7	2022-10-24	Alaksen	49.1	-123.17	8415
8	2022-10-24	Brunswick Point farm	49.06	-123.14	5085
9	2022-10-25	Alaksen	49.1	-123.17	8415
10	2022-10-26	Alaksen	49.1	-123.17	8415
11	2022-10-26	Brunswick Point farm	49.06	-123.14	5085
12	2022-10-27	Alaksen	49.1	-123.17	8415
13	2022-10-27	Brunswick Point farm	49.06	-123.14	5085
14	2022-10-28	Alaksen	49.1	-123.17	8415
15	2022-10-28	Blackie Spit	49.06	-122.87	8296
16	2022-10-29	Alaksen	49.1	-123.17	8415
17	2022-10-29	Blackie Spit	49.06	-122.87	8296

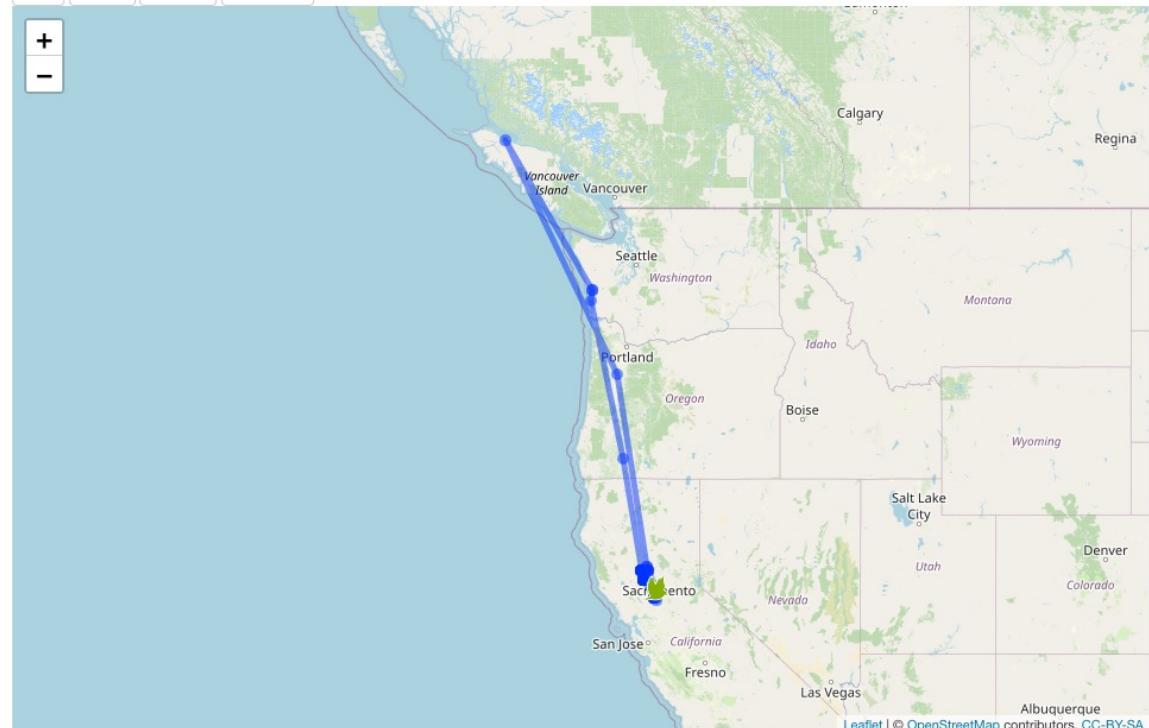
We parse and re-render the HTML response – in this case as a table

Receiver Detections

Date	TagDepId	Species
2023-02-10	43628	American Robin
2023-02-09	43628	American Robin
2023-02-07	43628	American Robin
2023-02-06	43628	American Robin
2023-02-05	43628	American Robin
2023-01-19	43628	American Robin
2023-01-18	43628	American Robin
2023-01-17	43628	American Robin
2023-01-16	43628	American Robin
2023-01-15	43628	American Robin
2023-01-14	43628	American Robin
2023-01-13	43628	American Robin
2023-01-12	43628	American Robin
2023-01-10	43628	American Robin
2022-10-29	37713	Dunlin

[Tag Detail](#) [Flight History](#) **Flight Map** [Species](#)

Use the buttons below to simulate the approximate path the bird flew. Note data may contain 'wild point' false detections that we do not attempt to filter out.

[Fly](#) [Stop](#) [Pause](#) [Resume](#)


Or here as a map on a tab panel

Receiver Detections

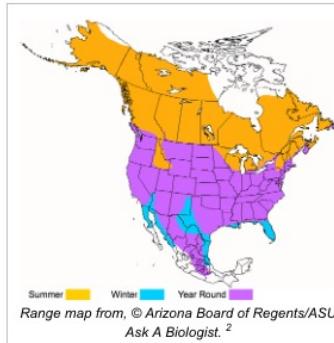
Date	TagDepId	Species
2023-02-10	43628	American Robin
2023-02-09	43628	American Robin
2023-02-07	43628	American Robin
2023-02-06	43628	American Robin
2023-02-05	43628	American Robin
2023-01-19	43628	American Robin
2023-01-18	43628	American Robin
2023-01-17	43628	American Robin
2023-01-16	43628	American Robin
2023-01-15	43628	American Robin
2023-01-14	43628	American Robin
2023-01-13	43628	American Robin
2023-01-12	43628	American Robin
2023-01-10	43628	American Robin
2022-10-29	37713	Dunlin

[Tag Detail](#) [Flight History](#) [Flight Map](#) [Species](#)

American Robin (*Turdus migratorius*)

Description: This member of the thrush family is 9 to 10 inches long and weighs about 3 ounces. Males are gray-brown with round reddish breasts, dark heads, and white crescents above and below each eye. Females and juveniles are similar but lighter in color.

Migration & Habitat: Robins can tolerate cold temperatures thus do not migrate unless forced by food scarcity and poor weather. They typically migrate to the Southwest, Mexico, and the Gulf Coast.



Reproduction: Robins build nests in trees or shrubs with grass, twigs, roots, and mud. The female lays from 3 to 5 eggs per clutch and typically raises two broods each season. The eggs hatch in about 2 weeks and the young leave the nest in 14 to 16 days.

Diet: Their diet is primarily invertebrates (such as grubs, earthworms, and caterpillars), fruits, and berries.

Conservation Status: Robins in Oregon are most abundant in the Willamette Valley and from Lincoln County northward.³ Populations have slightly increased, and they are a low conservation concern. Ground foraging makes them vulnerable to pesticide poisoning and predation by cats.



American Robin - Karney, Lee USFWS¹

Fun Facts:

- Robins are fast fliers, up to 20-35 miles per hour in good weather.
- They live about 2 years in the wild. Some live 6 to 9 years. The oldest known lived 13 years.
- Their keen eyesight can see tiny disturbances in the soil that indicate food.
- Robins pair up in the spring but separate once their family is raised.
- They are a known host for West Nile virus.

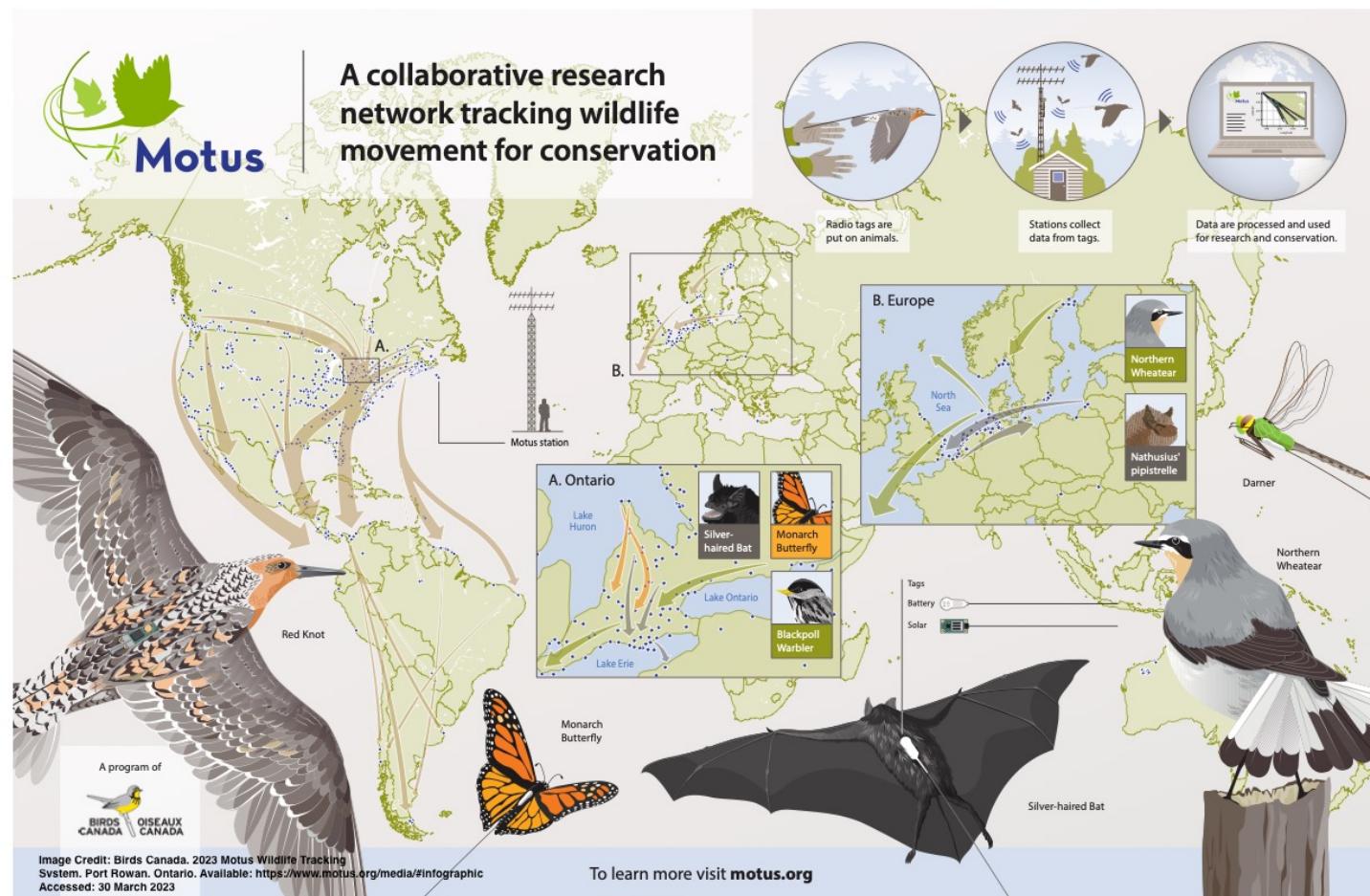
Prepared by Vickie Stiteler

Credits:

¹Title: American Robin Credit: C Karney, Lee USFWS

Source: <https://digitalmedia.fws.gov/digital/collection/natdigilib/id/4488/rec/161>

You can also write your own content about species you detect



And link to educational information about motus.org

One application - many deployment options



- Full Kiosk mode.
- Run directly from RStudio for your own use (only when you need it).
- Run ‘locally’ in R as a background task and point any browser to it (awsy there, local area network, viewable by others)
- Host it on your organization’s internal or external www web servers.
- Push it to a web hosting service for www public access (shinyapps.io)
- Perhaps create customized versions for your station funders.

Getting the Code

- Its all available on GitHub
- GNU General Public License v3.0
- Lots of README documentation and ‘cookbooks’
- **1_START_HERE.md**
- If you doing a windows “full kiosk mode” **READMEs** for configuring Windows startup and OpenKiosk

The screenshot shows the GitHub repository page for `rschramm9/AHNC_MOTUS_KIOSK`. The repository is public and has 88 commits. The code tab is selected, showing a list of recent commits:

Commit	Message	Time Ago
4cddbdb	Richard Schramm v4.0.1 with homepages specified in sample.cfg files	5 hours ago
88 commits	(See release notes)	
Logs	Added the Logs directory and README	4 months ago
data	Commit numerous changes for version 4.0.0. See release notes.	3 days ago
md_images	forgot to add new image to README.md	(See release notes)
modules	homepage html files are now specified in the config file. created...	5 hours ago
www	homepage html files are now specified in the config file. created...	5 hours ago
.gitignore	Commit numerous changes for version 4.0.0. See release notes.	3 days ago
AnkenyKiosk.Rproj	Initial commit.	5 months ago
BUILDING_THE_APP_README.md	Added a Species tab next to the flight map that displays a static...	4 months ago
DEVELOPERS_README.md	added section on updating R howto	4 months ago
FINAL_DEPLOYMENT_WINDOW...	Overhaul the windows TaskScheduler setup procedures	4 months ago
LICENSE	Initial commit	5 months ago
LICENSE_ADDITIONAL_PERMIS...	Initial commit	2 days ago
MOTUS_MSWINDOWS_STARTS...	Added the new windows Task Scheduler startup files.	4 months ago

On the right side of the repository page, there are sections for About, Releases, Packages, and Languages. The 'About' section includes a description of the repository as the Ankeny Hill Nature Center MOTUS Kiosk, a Readme link, a GPL-3.0 license link, a star count (1 star), a fork count (3 forks), and a release count (13 releases). The 'Releases' section shows v4.0.0 as the latest release. The 'Languages' section indicates no packages published.

https://github.com/rschramm9/MOTUS_KIOSK

Is it really that simple ?



- Yes and no... it depends on your skill set or the people you can rope-in to assist.
- To get started, the effort is more like ‘system administration’ than ‘coding’
- To get the App running you need some RStudio experience, installing the packages, running apps etc.
- Need to edit simple html for home and species pages in a text editor.
- If you want to get change layouts fonts etc. you also need to be pretty comfortable with Cascading Style Sheets (CSS).
- The repository README files should get you through the ‘starting gate’ with the application and OpenKiosk on windows.

Making it your own

- The basic setup is configuration file driven.
- Edit the kiosk config, give it a logo, tell it which receivers, edit the homepages and restart the application.

```
ReceiverDeploymentID=8691,7474,7950
ReceiverShortName="Nisqually Delta WA", "Oysterville WA", "Tokeland WA"
MainLogoFile="images/logos/salem_audubon_logo.png"
NavBarColor="#c14d21"
TitlebarColor="#c14d21"
MainLogoHeight=140
MainTitle="Motus Receiver at:"
HomepageEnglish="www/docs/salem_audubon_homepage_en.html"
HomepageSpanish="www/docs/salem_audubon_homepage_es.html"
HomepageFrench="www/docs/salem_audubon_homepage_fr.html"

MovingMarkerIcon="images/icons/motus-bird.png"
MovingMarkerIconWidth=22
MovingMarkerIconHeight=22
InactivityTimeoutSeconds=3600
EnableReadCache=1
EnableWriteCache=1
CachePath="data/cache"
CacheAgeLimitMinutes=180
DeepCacheAgeLimit=20160
CheckMotusIntervalMinutes=10
HttpGetTimeoutSeconds=10
LogLevel=LOG_LEVEL_INFO
```



SALEM
AUDUBON
SOCIETY

Motus Receiver at: Nisqually Delta WA

Available
Receivers

Nisqually Delta WA ▾

English

Home Receiver Detections Motus News!

Click or touch "Receiver Detections" in the tab above to view data.

Default Homepage for a Generic Motus Data Kiosk

Insert your own html text and photos here.

This is the default English language homepage for a generic Motus receiver. It resides in your project's www/docs folder along with a Spanish language version.

You are welcome to copy and use it as a template to create your own custom homepage for your site. You should always create a Spanish language version of your page as well.

These .html files need to reside in the R project's www/docs sub-directory and the names need to be entered into your kiosk.cfg or sample.cfg file.

"The Motus Wildlife Tracking System (Motus) is an international collaborative research network that uses coordinated automated radio telemetry to facilitate research and education on the ecology and conservation of migratory animals."

- motus.org

Motus is the Latin word for "movement".

Please preserve the Credits and Citations shown below to properly recognize Motus developers!

Credits

Motus is a program of Birds Canada in partnership with collaborating researchers and organizations.
<https://motus.org/>

This site has been developed using Motus data access tools courtesy of: Bird Studies Canada. 2015. Motus Wildlife Tracking System. Port Rowan, Ontario.
Available: <http://www.motus-wts.org>.

Citation: Birds Canada (2022). motus: Fetch and use data from the Motus Wildlife Tracking System. <https://motusWTS.github.io/motus>.

Acceptable Use or Publication of Data

Any use or publication of the data presented through this application must conform to the terms of the Motus Collaboration Policy at <https://motus.org/policy/> and ensure proper recognition of Motus, Birds Canada, Motus researchers and projects.



A Motus Antenna Array. Schramm, Rich - Public Domain

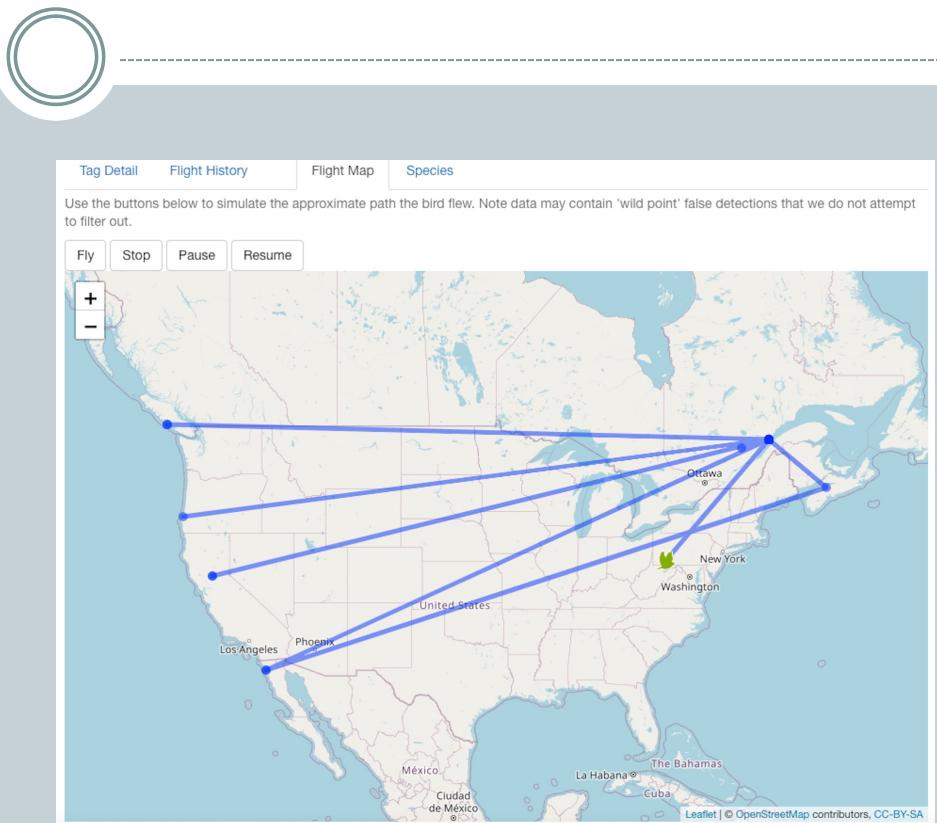
Issues



- Web harvesting is vulnerable to changes in the web pages by motus.org
- Our web deployed version on shinyapps.io has not been subject to much traffic.
- We don't know if we are able to stay on their monthly "free tier" when traffic increases.
- We need some "early-adopters" to expose gaps, errors or confusing directions in the installation guides and of course - inevitable bugs.

More issues and some opportunities

- Sometimes we get this!
- How to filter false or ambiguous detections.
- Need to span receiver deployments at a receiver?
- Smaller screen & very small screen support.
- Linux installation - perhaps a Raspberry Pi install?
- Other R experts to help with further development and community support.



Thanks



Resources:

- Software and documentation on GitHub
- The AHNC demo project & website
- I can help.

Questions?

https://github.com/rschramm9/MOTUS_KIOSK

https://ahnc.shinyapps.io/AHNC_MOTUS_KIOSK/

schramm.r@gmail.com

