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The Coastie Initiative

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Cherry, Nathan; George, Libby; Smith, Alex; and Houser, Chris, "The Coastie Initiative" (2022). *UWill Discover Conference*. 26.

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The Coastie Initiative

Nathan Cherry*, Elizabeth George, Alex Smith, Chris Houser



Abstract:

Coastline change is an ever-increasing area of interest with a multitude of research opportunities. The Coastie Initiative was developed in partnership with Parks Canada to crowdsource the collection of regular imagery of coastal morphology, building a large dataset for tracking shoreline change. Citizen scientists from across the country to participate in this growing program by submitting a "Coastie" through our web-based platform, while visiting one of our participating locations. At every site, a phone cradle, designed to standardize images across all devices, is accompanied by an informational panel and a QR code. Visitors can use the QR code to quickly access the submission wizard. After submission, the image is saved and awaits classification by a designated researcher. The intended development of the project includes an achievement system to promote user retention, an automated classification system to eliminate manual labelling, and an ocean literacy stream as an effort to educate and inform the public. The initiative was launched during the fall of 2021 with 5 participating locations: Prince Edward Island National Park, Kouchibouguac National Park, Fundy National Park, Point Pelee National Park, and Sable Island National Park Reserve. The Coastie program is a collaboration between Parks Canada and the University of Windsor that has developed from the global CoastSnap Community Beach Monitoring movement that began in Australia in 2017. Using the early prototype dataset, coastal change can be quantified from the repeat geo-rectified images. These images capture deposition or erosion of the beach and dune topography in response to ambient environmental conditions or higher energy storm events. Through time, this dataset will also serve as a baseline to monitor how coastal systems respond to climate change, including sea level rise, change in storm activity, and reduction in sea ice coverage. The Coastie Initiative provides a platform for citizen scientists to influence coastline exploration as they participate alongside motivated researchers. Beyond the advancements in this area of study, the program sets out to instill a pride and sense of urgency for the conservation of the nation's coastlines.

Interactive Activity:

#Coastie

Become a citizen scientist
Parks Canada is pleased to support a University of Windsor research initiative to monitor our changing coastlines.

1. Snap
Place your smartphone in the cradle and take a photo.

2. Share
Submit your photo (or photos) and select the direction (North or South).

- Coastiecanada.ca
- Scan the QR code to access the #Coastie submission portal or
- Tag us on social media using the hashtag for this #Coastie location

1. Photographiez
Placez votre téléphone intelligent dans le support et prenez une photo.

2. Partagez
Envoyez votre photo (ou vos photos) et choisissez la direction (nord ou sud).

- Coastiecanada.ca
- Scannez le QR code pour accéder au portail de transmission #Coastie ou
- pour accéder au portail de transmission #Coastie.

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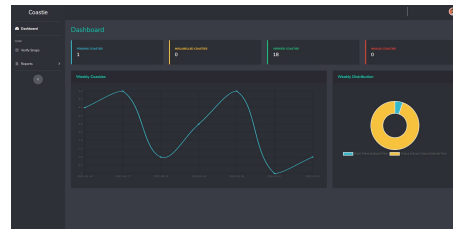
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Methodology:

The Coastie Initiative platform is created using the python-based web-framework, Django. The platform was created within a Docker container and is being hosted by the University of Windsor. As the project was expected to expand at a rapid rate, the web-application was designed with scalability at the utmost priority. The current prototype includes 5 distinct user types with varying permissions:

- **Unauthenticated User:** This user requires no log in and only has the ability to anonymously submit Coasties.
- **Registered User:** This user has no additional permissions to the unauthenticated user. The discerning factor is all submissions will be associated to the user's account for future incentive plans.
- **Researcher:** One level above the **Registered User**, the **Researcher** has access to the research/analytics panel. This panel is curated to provide a quick overview of website traffic as well as housing the submission verification system.
- **Admin:** This level of user has access to the admin panel and all associated permissions.
- **Superuser:** This level of user has all permissions without explicit assignment.



The platform consists of a main interface for submitting Coasties, an administration panel to directly interact with data and accounts, and an analytics dashboard (as seen above) for Coastie verification and platform statistics.

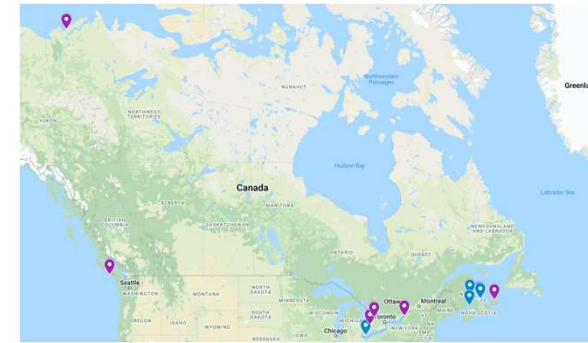
Results:

Current Sites:

- Cavendish
- Brackley Beach
- Kouchibouguac National Park
- Point Pelee National Park
- Fundy National Park Of Canada

Pending Sites:

- Pacific Rim National Park Reserve
- Tuktoyaktuk
- Cape Breton Island
- St Lawrence River
- Pinery Provincial Park
- Bruce County



Jan. 6th, 2022 – Pre Storms

Jan. 17th, 2022 – Post Storms

Composite

With the use of composite images, costal change can be analyzed over time. The above images, taken by citizen scientists at Brackley Beach, PEINP, display erosion of approximately one meter that occurred as a result of two winter storms.

Study Sites:

The Coastie Initiative aims to span across the country. In its prototype stage, is currently in five participating locations:

- Prince Edward Island National Park (4 sites)
- Kouchibouguac National Park (3 sites)
- Fundy National Park (3 sites)
- Point Pelee National Park (2 sites)
- Sable Island National Park Reserve (currently inactive)

During summer 2022, Coastie intends on expanding its presence to the Pacific Rim and Arctic Circle.



Visit Coastie

Conclusion:

The COASTIE program is a collaboration between Parks Canada and the University of Windsor that developed from the global CoastSnap Community Beach Monitoring movement that began in Australia in 2017. We acknowledge CoastSnap for their generous support in establishing COASTIE to capture changing coastlines throughout Canada. Verified and anonymized photographs taken at COASTIE stations are uploaded to the global database to capture changing coastlines. Coastie Canada is a CoastSnap program at Parks Canada sites.

Any municipality, citizen group or organization interested in becoming part of CoastSnap Canada should contact the University of Windsor Coastal Research Group at uwincoastalresearch@gmail.com