 Footage from a Miami, FL camera installed as part of the WebCOOS pilot project.

Join the Community Web Camera Observation Network

Web cameras or webcams are a low-cost coastal observing platform transforming how community environmental monitoring is conducted. Webcams can address significant gaps in the nation's ability to monitor and accurately forecast various weather, ocean, ecological, and public health hazards.

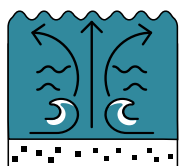
Webcams for Coastal Observations and Operational Support (WebCOOS) is a community supported low-cost webcam coastal observing network, which provides valuable imagery and tools for scientists, communities, and local coastal managers to make decisions.



 WebCOOS webcam located in Folly Beach, SC installed by University of South Carolina.

How can web camera data help your community?

Below are a few examples of how webcam data is transforming coastal monitoring.



Identify Rip Currents



Study Beach Erosion



Monitor Beach Usage



Flood Monitoring

Partnership Opportunity

There is strength in numbers! With more webcams, higher quality information can be provided to users. Communities can partner with SECOORA to either provide existing webcam streams or install a webcam in their chosen location and receive the imagery and data personalized for their needs.

A team will work with each community to help access the data available already or to determine the appropriate webcams, locations and installation. Customized products can be created for those that want alerts of interest to the community.

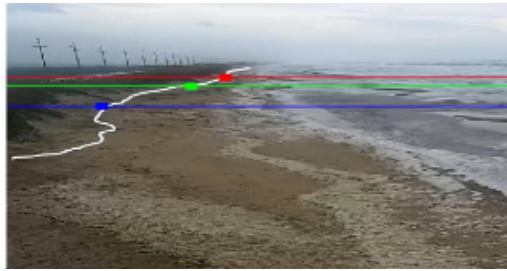
How are webcam data being used?



Identify Rip Currents

Machine learning and flow-based tracking can identify rip currents from webcam imagery.

This information can be used to inform the public of rip current dangers and improve NOAA rip current forecasts.



Study Beach Erosion

Algorithms are being developed to identify shoreline water levels (tides, storm surge, wave runup) from webcam imagery.

This information can identify potential dune erosion or overwash events, infrastructure risk and limitations to beach access.



Monitor Beach Usage

Machine learning tools can count a range of objects in a given area - including beach activities such as number of visitors and parking lot traffic.

This allows coastal managers to see how busy a location is during different times of the day, season, or year for planning and safety purposes.



Flood Monitoring

Public access to webcam imagery provides real-time monitoring and visualization of coastal flooding.

This helps to document flooding impacts and provide real-time alerts for local communities.



Next Steps

Interested in getting involved? Need a question answered? Contact us today!

Email: webcoos@secoora.org

Website: <https://webcoos.org/>



This is a SECOORA funded program. SECOORA is a non-profit that works to observe, understand, and increase awareness of our coastal ocean through strong partnerships.

My community would like to purchase and install a webcam. What is next?



Community Funding

A webcam can cost anywhere between \$400 and \$5,000, depending on the installation and application. In some cases, SECOORA can assist with funds for the purchase of the webcam. Once the webcam is installed, the ongoing costs are minimal power usage and video streaming costs. Real-time and archived access to the images and videos is free.



Location Identification

Communities should work together to identify a location for webcams based on the needs of the community. The project team will provide advice on the products which can be generated depending on the placement of the webcam.



On-Going Communication

Once the webcam is installed, community partners will be requested to work with the team to ensure continuing data flow and help define custom product needs for the community.

Examples of Webcams and Costs

The cost can vary greatly depending on the needs of the community (are you interested in flooding, beach usage, rip currents, etc.?) and the infrastructure available for the webcam (i.e., is there power and internet in place that can be leveraged?). The team will work with your community to help answer these questions.



- The Rosemont Community in Charleston, SC installed a webcam to take snapshot images to capture flooding within their community for less than \$500, which included camera, installation, power, and cellular access.
- SECOORA worked with a local contractor to install two streaming video webcams on Jennette's Pier in Nags Head, NC to observe rip currents and monitor wave runup. Contracted installations can be in the range of \$3,000 - \$5,000, but will typically include everything but monthly internet costs.
- A homeowner on Oak Island, NC installed a \$60 video webcam to help monitor storm impacts and understand how nourished beaches change over time.

I have a webcam that I want to integrate into the WebCOOS Network.

We are excited to work with you to determine if your webcam can be included as part of the network. While the ideal webcam is very much dependent on the potential use case, most any webcam footage can be helpful and useful to stream and store via the network.

General Webcam Characteristics

Webcam Features: Streaming video is generally preferred since it can benefit the greatest range of uses. Snapshot cams (i.e. image stills) are useful and may be preferred for some use cases such as object detection and flooding.

Webcam Elevation: Higher elevation is better for most use cases. The precise elevation needed will depend on the use case of interest, and the distance of the cam to the area of interest.

Webcam Angle: The area of interest should be towards the center of the viewing area. Avoid obstructions as much as possible – fences, trees, buildings, and paths where people or cars may obstruct the view. Lighting conditions, e.g. glare or shadows over the course of a day, should be considered.

Webcam Pan-Tilt-Zoom (PTZ): Less webcam movement is better and zooming should be minimized. Data is collected at 10-minute videos for each preset view.

Webcam Characteristics to Consider for Specific Use Cases



Rip current detection algorithms work best with video data from as high an elevation as possible and as close as possible to the surf zone. Stationary cams are preferred, if PTZ, ideally hold for at least 10 minutes in any one position.



For **studying beach erosion**, video is most useful, though snapshots can potentially provide some information. High elevation stationary webcams generally pointed alongshore to maximize the view of the surf zone and beach/dune are preferred.



For **monitoring beach use** (people, vehicle, or animal counting) high elevation stationary webcams are acceptable, however PTZ cams may be preferred to maximize coverage area. As detection algorithms will only recognize objects/persons usually within a 100 yard range (or where the person outline is more than 30 pixels large), placement at the beach dune line or as close to the beach activity to be monitored is required for this use case.



Flood monitoring applications can use snapshot or video and higher elevations are preferred. Ideally, if the webcam is PTZ, it should can hold for at least 10 minutes in any one position.

I have a webcam, how do I share my data?

Sharing your video or image feed is how we build the WebCOOS Network.

In order to properly incorporate your data into the project network, we need to ensure the following high level data requirements:

- Regular access to streaming video feed or to video or snapshot files.
- Video or snapshots should be in non-proprietary formats such as h.264/h.265 mp4 for video and jpg for snapshots.



Your video and images* can be uploaded into WebCOOS through one the following methods:

Option 1

(Preferred method)

Give WebCOOS access to your live RTSP feed.

Option 2

1. Upload standardized video files to WebCOOS regularly through an API (ftp, S3, etc.).
2. Provide WebCOOS access to video footage files that we can download periodically (http, ftp, S3, etc.).
3. Upload files via a website.

*Note in order to catalog and share the files, a robust metadata record will be created to describe the data. As long as you adhere to the naming conventions your data and products can be available through WebCOOS. The project team can help!

Questions?

If you have questions we are here to help. We will walk through the process with you. Contact us today!

Email: webcoos@secoora.org

Website: <https://webcoos.org/>



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Regional Association

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