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**Pre-workshop Questionnaire Summary for the WebCAT Workshop  
Exploring Applications, Opportunities and Challenges  
to Using webcams for Environmental Monitoring**  
November 14-15, 2018 | Charleston, SC

*Workshop attendees completed a pre-workshop questionnaire to determine if there were common practices or challenges across the group. There were 33 respondents. A summary is below.*

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### **Web Camera Operation**

28% of respondents operate a web camera

72% of respondents do NOT operate a web camera

Below are the systems operated (includes open ended responses):

- FLIR/Point Grey/Streams 7
  - IP cameras
  - Axis series 6035s+
  - Prosilica and Point Grey cameras
  - Mini-Argus
  - NWS does not own webcam equipment, but frequently monitor webcams along the coast and incorporate data into operations.
  - Operate cameras for scientific data collection (e.g. Argus)
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### **Web Camera Protocols**

*Of the respondents that operate a web camera, below are the standard protocols they have in place.*

75% of camera operators have standard protocols for Host Acquisition

100% of camera operators have standard protocols for Camera Placement

100% of camera operators have standard protocols for Camera Operation (panning, still, etc.)

Other standard protocols reported:

- Site surveys
- Data storage
- Streaming
- Meta data
- Data processing

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## Web Camera Data Application

75% of respondents are applying or planning to apply web camera data

13% of respondents are NOT applying or planning to apply web camera data

12% of respondents skipped the question

Below are how respondents are applying or planning to apply web camera data:

- Coastal processes
- Nearshore hydrodynamics, bathymetry, topography, shoreline position
- rip current model validation
- Rip current model validation and surf zone bathy observations. High tide flooding observations.
- Rip current studies, surf forecasting, near shore wave model verification
- Monitoring Least Tern breeding on NOAA Pier Romeo
- Mostly shore line erosion over time
- shoreline change detection, wave runup observations, storm-induced coastal change observations, nearshore bathymetry
- Evaluation of models for a wide range of coastal hazards
- Developing AI algorithms for image classification
- Wanting to place Web cameras at Several Weather Stations around SC such as Sassafras Mountain and Botany Bay
- Hydrodynamic model validation, data assimilation, boundary conditions, bathymetric change in coastal and riverine environments
- exploring the potential for shore bird monitoring
- Counting things.
- A variety of meteorological phenomena including rip currents, waterspouts and other coastal hazards.
- Various ocean monitoring applications, in particular recreation.
- Ice validation, HAB preliminary warning
- Visitor use of a restoration site
- To support numerous applications

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## How Respondents are Storing Web Camera Data

- locally; send processed data to web
- post-processed image products
- Image Products (timex, etc), pixel time sequences
- Short (1-minute) movement-triggered video & static images
- Time sequences
- Time sequences
- No cameras installed at this time
- compressed video files, processed data
- AWS
- Images

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## How Far Back in Time Respondents are Storing Web Camera Data

- all of it
- all image products, no raw data
- 6 months
- Haven't had much success yet, so I have some data from one season
- perpetuity
- So far, from the beginning of the installation
- No cameras installed at this time
- 2011
- n/a
- 5 days via web, 30 days in cold storage.
- all images archived

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## Tools and/or Techniques for Web Camera Data Analysis

- Argus coastal imaging products
- Matlab codes for post-processing image data
- cbathy, timestack analysis,
- Raspberry Pi running the Motion open-source software with up to 3 cheap USB cameras.
- Coastal Imaging Research Network (CIRN)
- No cameras installed at this time
- Coastal Imaging Research Network (CIRN) GitHub repository/Legacy OSU Coastal Imaging Lab code/MATLAB scripts I write
- large situational awareness display which shows a large number of webcams along the coast into one place.
- Various operational tools for viewing multiple cams at once. Image processing software and machine learning techniques also in development.

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## Please share any specific topics or challenges that you would like to see addressed at the workshop.

- Presentation on CIRN - Coastal Imaging Research Network.
- Collection of camera calibrations for pre-existing or privately owned cameras in order to make quantifiable coastal observations/measurements; standard metadata of images/products.
- cloud storage, website access
- Power and communication to/from a remote site. 2) This was all volunteer work, so doing this on a very tight budget is a major requirement 3) Hosting web content publicly and automatically, 4) Screening video clips for interesting events to put online, 5) Weather-proofing the remote installation.
- We are currently retooling a former project from scratch. Our techniques are outdated and we would like to see and interact with others to gain more insights into better techniques and procedures.

- Specific requirements for web camera installation and data storage for each type of application for which there is a need.
- Standardization of camera operations to fill the broad scientific community.
- Data storage and sharing, encouraging people to participate in the Coastal Imaging Research Network (CIRN) community
- Artificial intelligence, how/where training data sets are developed
- Growth of WebCAT project after year 1.