

VIDEO METRIC SYSTEMS™

from NorthWest Research Associates, Inc.

Quantitative Video Monitoring Services for Coastal Zone Management and Engineering

Coastal zone managers and engineers are faced with difficult and complex choices in deciding how best to protect and maintain our vital shorelines. A key problem they face is errors and uncertainties in the information available to them on the processes that cause erosion of our beaches and the results of those processes. This problem is so important that the National Research Council (NRC) has recommended that better ways must be found to produce *quantitative* information for monitoring the causes and progress of coastal erosion.

With Video Metric Systems™ we've taken the NRC recommendation seriously. Using the Argus Beach Monitoring Station (ABMS), we can give you the quantitative information you want with the accuracy you need for managing your coastal resources. Our service produces numeric and graphical data products using state-of-the-art digital video image processing and photogrammetric techniques. Video-based monitoring lets us collect data continuously at low cost and produce spatial and time series analyses of shoreline processes over a wide range of averaging intervals.

Data Products and Services

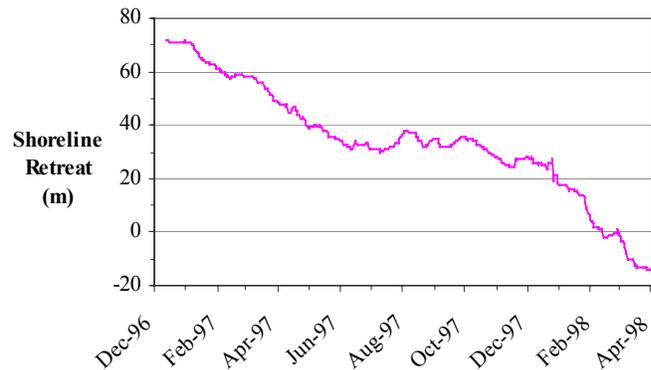
- Shoreline location
- Recreational beach width, area change
- Beach profiles, volume change
- Time series and trends analyses
- Offshore sand bar location, morphology
- Wave run-up statistics
- Confidence intervals, uncertainties
- Basic and advanced analyses and data packages
- Video imagery and movie archives
- Internet dissemination, web page hosting
- Project design and execution
- Supporting nearshore oceanographic and meteorological measurements

From Images...

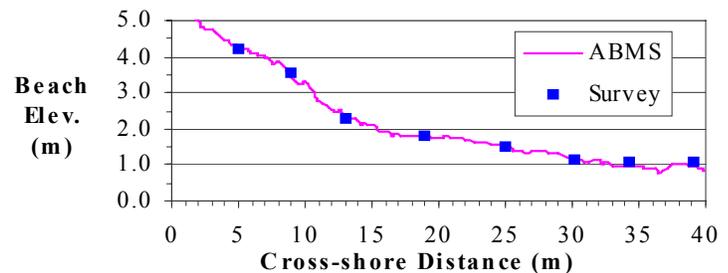


Argus station surveying a beach in New Zealand.

To Information



Shoreline retreat of a nourished beach (distance in meters) measured by an Argus station.



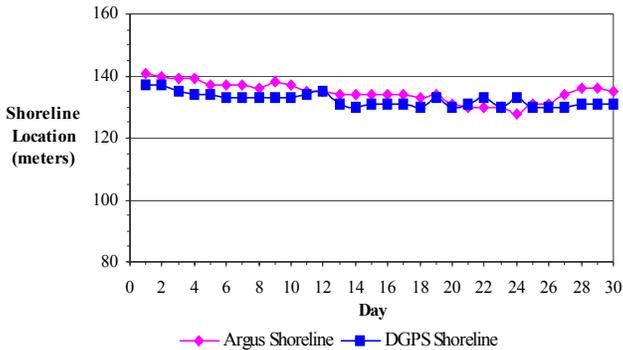
Cross-shore beach elevation (m) measured by an ABMS.

Video Metric Systems™ is the only service that gives you continuous, quantitative information on shoreline migration and beach erosion processes for managing your coastal resources.

Performance

Comparisons of Argus data to ground truth observations demonstrate that the Argus technology provides data of high quality and reliability. The table below summarizes typical performance specifications for an ABMS based on comparisons to ground truth data.

Comparison of shoreline location measured by an ABMS and Differential Global Positioning System (DGPS).



Performance specifications for an ABMS.

Parameter	Value
Range*	± 40 m to ± 2.5 km
Resolution*	At 100 meters from station: x,z = 0.1 m y = 0.5 m At 1000 meters from station: x,z = 0.5 m y = 12.5 m
Accuracy	0.35–2.4 m cross-shore 10-20 cm vertical
Averaging Int.	10 min. nominal

* Function of camera height and lens focal length

Benefits

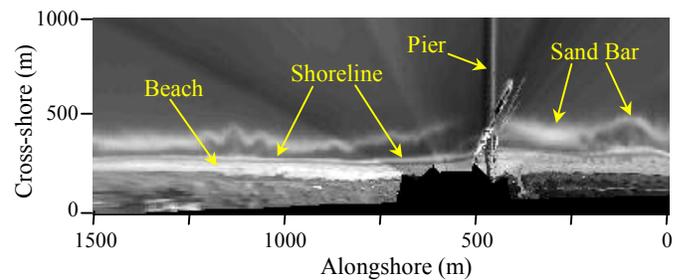
- Obtain cost-effective monitoring for coastal resource planning, management, and evaluation
- Characterize pre-storm/post-storm damage more completely and consistently
- Improve the accuracy of project designs, evaluate shoreline conditions more thoroughly, and recognize important trends earlier
- Identify erosion hot spots and plan suitable corrective actions sooner
- Receive continuous data with quality comparable to or exceeding traditional survey methods
- Create information for public outreach



An Argus Beach Monitoring Station

What is an Argus Beach Monitoring Station?

The key parts of an ABMS consist of video cameras pointed obliquely along a beach and a state-of-the-art SGI™ image processing system that produces snapshot, time exposure, and variance images. Using image rectification (see below) and analyses of pixel intensity, we can track coastal features in any coordinate system desired. Time series analyses identify changes in the locations of these features and their degree of variability.



Rectified plan view image of beach at Duck, NC.

The Argus technology was developed by researchers at Oregon State University. Argus stations are deployed in programs for the U.S. Army Corps of Engineers, U.S. Geological Survey, research laboratories, and universities. Now, NorthWest Research Associates, Inc. brings the Argus technology to the coastal zone management and engineering communities. We can design and execute the monitoring programs, process and analyze the data, and produce basic and advanced data packages and data deliverables for our clients.

How To Contact Us

Our toll-free number is **1-888-644-NWRA** (-6972), or send an e-mail to info@videometricsystems.com. You can find the latest news about Video Metric Systems™ at www.videometricsystems.com.



NorthWest Research Associates, Inc. • 14508 NE 20th St. • Bellevue, WA 98007-3713
425-644-9660 • FAX 425-644-8422 • www.nwra.com • www.videometricsystems.com