

Ajoy Kumar

Contact Information

Ajoy Kumar
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Education

University of Madras, India, B.Sc., Physics, 1985
University of Madras, India, M.Sc., Physics, 1987
Old Dominion University, VA, Ph.D., Physical Oceanography, 1996

Experience

Millersville University Department of Earth Sciences

Fall 2007-Present:

Assistant Professor, tenure-track. Taught, developed, and refined various senior and introductory level courses. Fostered actively funded oceanographic/remote sensing research program. Performed collaborative research with colleagues from several national and international laboratories and universities. Participated in numerous departmental collateral duties. Volunteered for various committees. Advised number of undergraduate students on various research projects, guided them to present their work at regional, national and international meetings, and publish their work in peer reviewed journals.

As a member of the Academic Advisory Council (AAC) for the Marine Science Consortium (MSC), actively participated in the Consortium's strategic Plan, developed and refined marine field courses, helped plan for new buildings, laboratories and oceanographic instruments for laboratories and research

vessels, and fostered collaborative student driven research with scientist from NASA Wallops Island and USFWS.

University of Miami Rosenstiel School of Marine and Atmospheric Sciences

January 2000-August 2007:

Assistant Scientist. Developed and tested improved SST retrieval algorithms in the infrared and mid-infrared wavelengths for AVHRR, GOES and MODIS sensors. Participated in a number of research cruises to collect data primarily for validation of satellite derived SST. Data includes skin temperature measured from the M-AERI and various physical oceanographic and meteorological instruments. Collaborated with scientists at the National Institute of Oceanography (NIO), India on studies involving physical-biological interactions in the coastal waters around India using satellite derived ocean color, temperature, sea surface height and *in situ* measurements. Supervised graduate students: Pietro Taballione, (2003-2005) and Chenglin Gan, (2005-2006).

January 1997-2000:

Post-doctoral Associate. Developed and tested improved SST algorithms for global and regional atmospheric conditions using AVHRR data from NOAA -9, -11, -14, -16 and -17 satellites. Contributed to the development of the Pathfinder Match-up Data Base (PMDB).

Old Dominion University, Norfolk, VA

Spring 1991-Spring 1996:

Ph.D. Graduate Research Assistant. Advisor: Dr. Gabe Csanady. Formulated and developed doctoral dissertation, "Observation of Shelfwater Overrunning the Southern Slope Sea". Actively participated in number of cruises and projects at Center for Coastal Physical Oceanography along with **Dr. Larry Atkinson.**

National Institute of Oceanography, Goa, India

September 1987-1990:

Scientist. Participated in research cruises during monsoons and inter-monsoon periods to study circulation features and coastal processes. Processed and analyzed ocean color data from CZCS over the Arabian Sea and Bay of Bengal.

Active Grants and Contracts:

External Grants:

Faculty member: **Ajoy Kumar**

Title of grant: Projecting the impacts of Climate Change and Identifying adaption options at Chincoteague National Wildlife Refuge

Grant amount: \$161, 012.29, FY 10-11, \$344,330 total (2010-2013)

Awarding agency: NASA

Faculty member: **Ajoy Kumar, O. Dreon, N. Dietrich, D. Dagit, J. Boal, J. Ambler, J. Bray, and R. Smith**

Title of grant: Wallops Island Science Training Program for Emergency Certified Teachers

Grant amount: \$135,000, 2010-2013

Awarding agency: PASSHE

Grants pending:

Faculty members: Ajoy Kumar

Title of Grant: Develop Site Specific Algorithms to reduce elevation errors in the processing of LIDAR data for coastal habitats.

Grant amount: \$264,825.65

Awarding agency: US Fish and Wild Life Service (USFWS)

Refereed Publications

S. Prasanna Kumar, Jayu Narvekar, M. Nuncio, **A. Kumar**, N. Ramaiah, S. Sardesai, Mangesh Gauns, Veronica Fernandes, and Jane Paul . "Is the biological productivity in the Bay of Bengal light limited?" *Current Science* (Vol.98; No.10; pp 1331-1339).

Kumar A. and J. Gilchrist. Application of satellite derived Sea Surface Temperature (SST) Fields along the Delmarva region. Proceedings of the International GHRSSST User Symposium, Santa Rosa, California, USA 28-29th May 2009.

L. Illari, J. Marshall, A. Tandon, S. Lee, **A. Kumar** ,P. Bannon, R. Najjar, G. McKinley, M. Morgan, T. Haine, R. Clark, T. Sikora and K. J. Mackin, **2009** "Weather in a Tank": exploiting laboratory experiments in the teaching of meteorology, oceanography and climate. *Bull. Amer. Meteor. Soc.*, **90**, 1619-1632.

Kumar, A., Valle-Levinson, A. and L. P. Atkinson, 2006. Overrunning of Slope Sea by shelf water in the Southern Mid-Atlantic Bight. **Progress in Oceanography**, **70**, Nos. 2-4, **213-232**.

Kumar S. P., M. Nuncio, J. Narvekar, **A. Kumar**, S. Sardesai, S. N. de Souza, Mangesh Gauns, N. Ramaiah and M. Madhupratap, 2004. Are eddies nature's trigger to enhance biological productivity in the Bay of Bengal? **Geophys. Res. Lett.**, **31**, doi:10.1029/2003GL019274.

Kumar, S. P., J. Narvekar, **A. Kumar**, C. Shaji, P. Anand, P. Sabu, G. Rijomon, J. Josia, K. A. Jayaraj, A. Radhika, and K. K. C. Nair, 2004. Intrusion of the Bay of Bengal water into the Arabian Sea during winter monsoon and associated chemical and biological response. **Geophys. Res Lett.**, **31**, doi:10,1029.2004GL020247.

Kumar A., 2004. Observation of intense sun glint in the daytime mid-infrared MODIS channels, **Gayana**, **68(2)**, 344-347.

Kumar, A., P. J. Minnett, G. P. Podesta and R. H. Evans, 2003. Error characteristics of the atmospheric correction algorithms used in retrieval of sea surface temperatures from infrared satellite measurements; global and regional aspects. **Journal of Atmospheric Sciences**, **60**, 575-585.

Nakamoto S., H. Saito, K. Muneyama, T. Sato, S. Prasasana-Kumar, **A. Kumar** and R. Frouin, 2002. Ocean bio-geophysical modeling using Mixed Layer-Isopycnal General Circulation Model coupled with photosynthesis process parameterization. **Research Signpost**, **37.661 (2)**, Fort P. O., Trivandrum-695 023, Kerala, India.

Kumar, A., P. J. Minnett, G. P. Podesta, R. H. Evans and K. Kilpatrick, 2000. Analysis of Pathfinder SST Algorithm for Global and Regional Conditions. Special issue on the international JGOFS Symposium on 'Biogeochemistry of the Arabian Sea' Proceedings of the Indian Academy of Science: **Earth and Planetary Sciences**, **109**, No. 4, 395-405.

Kumar, A. 1996. Overrunning of Slope Sea by Shelfwater in the Southern Mid-Atlantic Bight. **Ph. D. Dissertation, Old Dominion University, Norfolk, VA.**

J. J. Goes, H. Do. R. Gomes, **A. Kumar**, A. H. Parulekar, A. Gouveia and L. V. G. Rao, 1992. Satellite and ship studies of phytoplankton along the West Coast of India. **Oceanography of the Indian Ocean**, **B. N. Desai (editor)**, 67-80.

P. V. Sathe and **A. Kumar**, 1990. Remote sensing of sea state by the Brewster's angle technique. **Defence Sci. Journal**, Vol. **40,2**,119-131.

Publications in Review:

Davies, A., **A. Kumar**, and J. Moisan, 2011. CODAR observed spatial resolution of tidal dynamics along the lower Delmarva peninsula.

Gilchrist, J., A. Davies, and **A. Kumar**, 2011. A simple technique to remove tidal influence from ADCP measurements.

Ambler, J. and **A. Kumar**, 2011. Seasonal nearshore distributions of tunicates and the cladoceran *Penilia avirostris* in the southern Mid-Atlantic Bight.

Other Publications

Nakamoto, S., S. P. Kumar, J. M. Oberhuber, P. Sammarco, K. Muneyama, T. sato, **A. Kumar**, R. Frouin, 2002. Upper Ocean Circulation Modulation by Phytoplankton Concentration in the Equatorial Pacific and the Indian Ocean. **PORSEC BALI Proceedings.**

Kumar, A. and P. J. Minnett, 2000. Diurnal variation of SST and Heat Fluxes in the Tropical Pacific. Proceedings of the 5th Pacific Ocean Remote Sensing Conference (PORSEC) 5-8 December, Goa, India. **Vol. II: pp 809-812.**

Non-refereed Publications and Presentations from Conferences and Workshops

Kumar, A, N. Murray and M. Miziorko, 2011: LIDAR processing and Analysis. A project status report presented at the NASA-MSC-USFWS meeting at Harrisburg, February 5th, 2011.

Kumar, A, N. Murray and M. Miziorko, 2011: LIDAR processing and Analysis. A project status report presented at the NASA-MSC-USFWS meeting at Marine Science Consortium, March 7th, 2011.

Murray, N, A. Kumar and M. Miziorko, 2011: Airborne LIDAR Assesment of Wallops Island, VA. Presented at the Atlantic Estuarine Research Society (AERS) Spring 2011 Meeting, Solomons, MD, April 7-9, 2011.

Kumar, A, N. Murray and M. Miziorko, 2011: Projecting the impacts of Climate Change and Identifying Adaption Options at the Chincoteague National Wildlife Refuge. Presented at the Coastal Zone Research Symposium, Marine Science Consortium, Wallops Island, Va, May 13-14, 2011.

J. Gilchrist, A.R. Davies and A. Kumar, "A simple technique to remove tidal influences from ADCP measurements". International Ocean Sciences Meeting, Portland, OR, Feb. 23-26th, 2010.

A. R. Davies, J. R. Moisan and A. Kumar, "Using HF Radar to Observe Coastal Ocean Tidal Features". International Ocean Sciences Meeting, Portland, OR, Feb. 23-26th, 2010.

A. Kumar, "Long Term Density Stratification Trends off Delmarva Shelf Region". International Ocean Sciences Meeting, Portland, OR, Feb. 23-26th, 2010.

Kumar A. and J. Gilchrist. Application of satellite derived Sea Surface Temperature (SST) Fields along the Delmarva region. International GHRSSST User Symposium, Santa Rosa, California, USA 28-29th May 2009.

Kumar A. and P. J. Minnett. Error Characteristics of the sea surface temperature algorithm. Ocean Sciences Meeting, Orlando, Florida, March 2-7th, 2008.

Kumar A., B. McCormick and K. Hoyt. Monitoring the coastal ocean environment for Harmful Algal blooms. Ocean Sciences Meeting, Orlando, Florida, March 2-7th, 2008.

Minnett, P.J., R. H. Evans, K. Kilpatrick, **A. Kumar**, W. Baringer, E. Key, M. Szczodrak, S. Walsh and V. Halliwell. Sea-surface Temperature from MODIS-recent Progress in improving accuracy. MODIS Science Team Meeting, Adelphi, MD, October 31-November 2, 2006.

Minnett, P.J., R. H. Evans, K. Kilpatrick, **A. Kumar**, W. Baringer, E. Key, M. Szczodrak, S. Walsh and V. Halliwell. Validation of Sea-surface Temperatures from MODIS. MODIS Science Team Meeting. Adelphi, MD. October 31 - November 2, 2006

Minnett, P. J., R. H. Evans, K. Kilpatrick, M. Szczodrak, E. L. Key and **A. Kumar**. At-sea validation of oceanic and atmospheric variables derived from NASA EOS infrared imaging spectroradiometers MODIS and AIRS. Conference on Characterization and Radiometric Calibration for Remote Sensing (CALCON06), October 5, 2006. Utah State University, UT.

Kumar, A. Status of Satellite Infrared sea surface temperature (SST) retrievals in the Indian Ocean. Sustained Indian Ocean Biogeochemical and Ecological Research Workshop, 3-6 October, 2006, Goa, India.

Kumar, A. P. J. Minnett and C. Gan. Satellite Observation of Oceanic Processes in the Indian Ocean. 13th Ocean Sciences Meeting, Honolulu, HI, 20-24 February, 2006.

Minnett, P. J., O. B. Brown, R. H. Evans, E. L. Key, E. J. Kearns, K. Kilpatrick, **A. Kumar**, M. Szczodrak & S. Walsh. Sea Surface Temperatures from MODIS. MODIS Science Team Meeting, Baltimore, MD. March 22-24, 2005.

Minnett, P.J., O. B. Brown, R. H. Evans, E. L. Key, E. J. Kearns, K. Kilpatrick, **A. Kumar**, K. A. Maillet, and M. Szczodrak. Sea-surface temperature measurements from the Moderate-Resolution Imaging Spectroradiometer (MODIS) on Aqua and Terra. IEEE International Geoscience and Remote Sensing Symposium (IGARSS'04), September 20-24, 2004, Anchorage, AK.

Minnett, P.J., R. H. Evans, E. J. Kearns, K. Kilpatrick, K. A. Maillet, **A. Kumar**, W. Baringer, S. Walsh, E. L. Key, M. Szczodrak and O. B. Brown, Sea surface temperature measurements from the MODerate-resolution Imaging Spectroradiometer (MODIS). Workshop to Discuss Potential NESDIS Operational Products from MODIS. Silver Spring, MD. June 9, 2004.

Minnett, P.J., O. B. Brown, D. Cucchiara, R. H. Evans, E. L. Key, E. J. Kearns, K. Kilpatrick, **A. Kumar**, K. A. Maillet, C. Maxwell, G. Szczodrak Applications of the Marine-Atmospheric Emitted Radiance Radiometer (M-AERI). Explorer of the Seas Media Event. Explorer of the Seas, June 15, 2004.

Kumar, A. and P. J. Minnett, Validation and analyses of SST fields over the TWP area. ARM conference, 20-26 March, 2004.

Minnett, P.J., R. H. Evans, E. J. Kearns, K. Kilpatrick, **A. Kumar**, W. Baringer, O. B. Brown and W. Esaias. AQUA MODIS Sea Surface Temperatures. Aqua Science Working Group Meeting, NASA Goddard Space Flight Center, Greenbelt, MD, May 28, 2003.

Minnett, P.J., R. H. Evans, E. J. Kearns, K. Kilpatrick, K. A. Maillet, **A. Kumar**, W. Baringer, S. Walsh, E. L. Key, M. Szczodrak & O. B. Brown. Sea surface temperature measurements from the MODerate- resolution Imaging Spectroradiometer (MODIS) on AQUA. AGU Fall Meeting, San Francisco, CA. December 9, 2003.

Minnett, P.J., O. B. Brown, R. H. Evans, E. L. Key, E. J. Kearns, K. Kilpatrick, **A. Kumar**, K. A. Maillet, and M. Szczodrak. Sea-surface temperature measurements from the Moderate-Resolution Imaging Spectroradiometer (MODIS) on Aqua and Terra. IEEE International Geoscience and Remote Sensing Symposium (IGARSS'04), September 20-24, 2003, Anchorage, AK.

Kumar, A. and P.J. Minnett. Ocean surface temperature from GOES. Seventh International Conference on Remote Sensing for Marine and Coastal Environments, Miami, Florida, USA, 20 May, 2002.

Evans R.H., P.J. Minnett, O.B. Brown, I.L. Barton, E.J. Kearns, K. Kilpatrick, R.J. Sikorski, **A. Kumar** and A.M. Závody. Measurements of the Ocean Surface Temperature from the Moderate Resolution Imaging Spectroradiometer (MODIS). IEEE International Geosciences and Remote Sensing Symposium. Sydney, Australia. July 9-13, 2001.

Brown, O. B., P. J. Minnett, R. H. Evans, E. J. Kearns, V. Banzon, W. Baringer, J. Brown, J. Hanafin, E. Key, K. Kilpatrick, **A. Kumar**, K. Maillet, M. Szczodrak and S. Walsh. Sea Surface Temperature - MOD 28 Status. *MODIS Science Team Meeting*, Baltimore, 18 December, 2001

Kumar, A. and P. J. Minnett, Diurnal variation of SST and Heat Fluxes in the Tropical Pacific. Pacific Ocean Remote Sensing Conference, 5-8 December 2000.

Kumar, A. and P. J. Minnett, Process studies in Bay of Bengal. Pacific Ocean Remote Sensing Conference, 5-8 December 2000.

Kumar, A. R. H. Evans, P. J. Minnett, O. B. Brown, I. J. Barton, E. J. Kearns, K. Kilpatrick, R. J. Sikorski and A. M. Zavody. Measurements of the ocean surface temperature from the Moderate Resolution Imaging Spectroradiometer (MODIS). IGARSS. Washington DC, 20-25 July, 2000.

Kumar, A. and P. J. Minnett, Validation of satellite data in the North Indian Ocean. Ocean Sciences Meeting of the American Geophysical Union. San Antonio, Texas, 24-28 January 2000.

Kearns, E. J., R. H. Evans, P. J. Minnett, O. B. Brown, K. Kilpatrick, S. walsh, **A. Kumar**, W. Baringer, J. Brown, and R. Sikorski. New SST and Ocean Color Data from MODIS/Terra: Caveat Emptor?. NOAA Atlantic Oceanographic and Meteorological Laboratory, Miami, FL, June, 2, 2000.

Minnett, P.J., **A. Kumar** and L.L. Ma. Satellite Remote Sensing for the Atmospheric Radiation Measurements Program (ARM) North Slope of Alaska/Adjacent Arctic Ocean Region. Ninth ARM Science Team Meeting, San Antonio, TX, 22-26 March 1999.

Kumar, A. and P. J. Minnett, Satellite Remote Sensing for the Atmospheric Radiation Measurements Program (ARM) North Slope of Alaska/Adjacent Arctic Ocean region. ARCUS, The Arctic Forum, 22-23 March 1999.

Kumar, A and P. J. Minnett, Validation of sea surface temperature in the Arabian Sea. International Scientific Symposium and Training Course on Biogeochemical Modeling of the Ocean, Bangalore, India, 18-29 January 1999.

Minnett, P.J., **A. Kumar** and L.L. Ma. Satellite Remote Sensing for the Atmospheric Radiation Measurements Program (ARM) North Slope of Alaska/Adjacent Arctic Ocean Region. Ninth ARM Science Team Meeting, San Antonio, TX, 22-26 March, 1999.

Minnett, P.J. and **A. Kumar**. Satellite Remote Sensing for the Atmospheric Radiation Measurements Program (ARM) North Slope of Alaska/Adjacent Arctic Ocean Region. 11th Annual meeting of the ARCUS, 21-22 March 1999. Arlington, VA.

Minnett, P.J., O. B. Brown, R. J. Sikorski, **A. Kumar**, K. Kilpatrick and A. M. Závody. MODIS SST retrievals – algorithm derivation, error budget and plans for validation. *MODIS Science Team Meeting*, College Park, MD. December 15, 1998.

Minnett, P.J., J.A. Hanafin, **A. Kumar**, E. Kearns, R. Sikorski, E. Key and M. Szczodrak, Measurements of near-surface temperature gradients during GASEX'98. GaseX '98 Data Workshop. Miami, October 26-27 1998

A. Kumar and G. T. Csanady, Satellite observation of shelf water overflow in the Southern Mid-Atlantic Bight. American Geophysical Union Fall meeting, San Francisco, 7-11 December 1994.

A. Kumar, NASA Summer School for Earth Sciences, Processes of Global Change., Pasadena, LA, 9-13 August 1993.

Course Instruction at Millersville University

ESCI 104 - The World's Ocean
ESCI 105- World Ocean Lab
ESCI 261- Introduction to Oceanography with lab
ESCI 364 – Descriptive Physical Oceanography
ESCI 365 – Dynamical Physical Oceanography
ESCI 366- Ocean Resources
ESCI 446- Statistical Meteorology
ESCI 267 – Field Methods in Oceanography
ESCI 384 – Remote Sensing and Image Interpretation
ESCI 485– Air/Sea Interaction

Student Projects at Millersville University

Monitoring Harmful Algal Blooms along the Florida Coast. **With Brian McCormick and Katie Hoyt.**

Analysis of ADCP data along the Delaware-Virginia Coast. **With Justin Gilchrist**

Analysis of CODAR Data along the Delaware-Virginia Coast: **With Alex Davies**

Ocean Circulation studies Off Delmarva: **With Virginia Maroulis and Sigourney Stelma**

Projecting the impacts of Climate Change and Identifying Adaptation Options at Chincoteague National Wildlife Refuge: **With Nate Murray and Matt Miziorko**

Honors

Scholarship, Center for Coastal Physical Oceanography, Old Dominion University
Research Fellowship, Council of Scientific and Industrial Research, Government of India

Reviewer

Journal of Physical Oceanography
Journal of Geophysical Research-Oceans
Geophysical Research Letters
Journal of Atmospheric and Oceanic Technology
Remote Sensing of Environment
Deep Sea Research I
Deep Sea Research II

Professional Affiliations

American Geophysical Union
Indian Association of Physical Sciences
Mid-Atlantic Coastal Ocean Observing Regional Association