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Huiqing Liu

EDUCATION

- 2002-2006 Ph.D., Marine Sciences
Dissertation title: Analysis and modeling of wave-current interaction.
North Carolina State University, Raleigh, North Carolina
- 1999-2002 M.S., Physical Oceanography
Thesis title: Analysis of Indian Ocean Dipole mode.
Ocean University of China, Qingdao, China
- 1995-1999 B.S., Physical Oceanography
Ocean University of China, Qingdao, China

PROFESSIONAL EXPERIENCE

- 11/2013-present Research Scientist
MDL/NWS/NOAA
- 12/2011-present Adjunct Assistant Professor
Marine, Earth and Atmospheric Sciences Department
North Carolina State University, Raleigh, North Carolina
- 09/2010-10/2013 Research Scientist
International Hurricane Center
Florida International University, Miami, Florida
- 01/2007-08/2010 Research Associate (Post Doc)
Marine, Earth and Atmospheric Sciences Department
North Carolina State University, Raleigh, North Carolina
- 08/2002-12/2006 Graduate Research Assistant (Ph.D)
Marine, Earth and Atmospheric Sciences Department
North Carolina State University, Raleigh, North Carolina
- 09/1999-06/2002 Graduate Research Assistant (Master)
Marine Environmental College
Ocean University of China, Qingdao, China.

RESEARCH INTERESTS

- Physical oceanography, including coastal circulation, storm surge, tides and wave dynamics. Study of the sensitivity of near-shore wind waves to hurricane wind asymmetry and translation speed;
- Satellite Oceanography, including ocean color satellite, processing and analyzing data from various satellite data, applying satellite data to various ocean models to improve model results, developing and improving algorithms for satellite products, evaluating algorithms using the in situ measurements, using satellite data to study ocean/atmosphere dynamics and interactions between physics and biology;
- Construction of numerical modeling schemes to predict hurricane induced storm surge, inundation and waves;
- Study wave-current effects on simulating coastal circulation, storm surge, flooding and prediction of waves;
- Construction of ocean-wave-atmosphere coupling system to forecast hurricane intensity and track.
- Examination of wave-current interaction dynamics using numerical model and examination of parameterization of wind drag coefficient (C_d);
- Study coastal ocean sediment transport and coastal beach erosion.

MODELING SKILLS:

POM (Princeton Oceanic Model)
HYCOM (HYbrid Coordinate Ocean Model)
SWAN (Simulating Waves Nearshore)
WAVEWATCH (Wave Model)
WRF (The Weather Research and Forecasting Model)
SLOSH (NOAA Storm Surge Model)
CEST (FIU Storm Surge Model)
ROMS (Regional Ocean Modeling System)

COMPUTER SKILLS

Fortran 77/90, MATLAB, NCL, ArcGIS, Python, Tcl/Tk, and C/C++ under Unix/Linux Red hat/Windows operating systems, Visual Basic, Excel, Word, PowerPoint, parallel computing, MCT (The Model Coupling Toolkit)

TEACHING EXPERIENCE

One lecture about 'Introduction of storm surge' in course of MARINE METEOROLOGY (NCSU MEA 467)

One lecture about 'Oceanic General Circulation' in course of MARINE METEOROLOGY (NCSU MEA 467)

One lecture about 'Overview of Air-Sea Coupling Mechanisms' in course of MARINE METEOROLOGY (NCSU MEA 467)

PRESENTATIONS ON PROFESSIONAL MEETINGS

03/2008 Oral Presentation at Ocean Science Meeting (POM Gathering) in Orlando, FL.

Presentation title POM-4DVAR, Wet & Dry and Wave-Current

07/2007 Trendy Perspectives and Hazard Implications in Coastal Water Variability and Rise

Len Pietrafesa (presenter), Shaowu Bao, Machuan Peng, Huiqing Liu, Meng Xia, Tom Karl¹ and Dave Dickey

01/2007 Storm Surge and Inundation Workshop in New Orleans, LA.

07/2006 Oral presentation at the 2006 Chinese Academy of Sciences Conference on Marine Sciences in Qingdao, China (Invited).

Presentation title '*Effect of ocean surface waves on storm surge and coastal flooding*'.

04/2006 Oral presentation at the 27th Conference on Hurricanes and Tropical Meteorology in Monterey, CA.

Presentation title '*Effect of ocean surface waves on storm surge and coastal flooding*'.

02/2002 Oral presentation at tropical ocean environment and climate change conference meeting in Sanya, Hainan Province, China.

Presentation title '*A dipole mode at thermocline layer in the tropical Indian Ocean*'.

OCEANOGRAPHIC CRUISES

01/2002 Two-week cruise in Baohai Sea of China for winter circulation investigation.

10/2001 Two-week cruise in Baohai Sea of China for summer circulation investigation.

AWARDS RECEIVED

2002-2006 Research Assistantship at North Carolina State University.

1999-2002 Research Assistantship at Ocean University of Qingdao.

1996-1999 Academic Excellence Scholarship (First Prize awarded each year) Ocean University of Qingdao.

PROFESSIONAL SOCIETY AND COMMITTEES

2003-present Member of the American Geophysical Union.

2006-present Member of the American Meteorological Society.

REVIEW EXPERIENCES

One time for Bulletin of the American Meteorological Society

One time for Ocean Engineering

PUBLICATIONS

BOOK

Standard Training Course for storm surge, Chapter 8, chapter 9 and chapter 10.
2011

Refereed Publications

1. **Liu, H.**, K. Zhang and Y.Li, *Numerical Study of the effects of the Port of Miami (Dodge Island) on Storm Surge Flooding in Biscayne Bay*, in preparation for submission to Geophysical Research Letter, 2014.

2. **Liu, H.** and K. Zhang, *Numerical study of the relationship between storm surge domain size selection and radius of Hurricane*, in preparation for submission to Geophysical Research Letter, 2014
3. **Liu, H.**, K. Zhang, Y. Li and L. Xie, *Numerical Study the Sensitivity of Mangrove in reducing Storm Surge and Flooding to Hurricane Characteristics in Southern Florida*, Continental Shelf Research, 64, 51-65, 2013.
4. Zhang, K., Y. Li, and **H. Liu**, J. Rhome, and C. Forbes. Transition of the Coastal and Estuarine Storm Tide Model to an operational forecast model: A case study of Florida, Weather and Forecasting: DOI:10.1175/WAF-D-12-00076.1, 2013.
5. Zhang K., Y. Li, **H. Liu**, H. Xu and J. Shen, Comparison of Three Methods for Estimating the Sea Level Rise Effect on Storm Surge Flooding, Accepted by Climatic Change, 2012
6. **Liu, H.**, B. Liu, L. Xie and K. Zhang, *Simulation of Ocean Response to an Idealized Landfalling Tropical Cyclone Using a Coupled Atmosphere-Wave-Ocean Modeling System*, Accepted by Tropical Cyclone Research and Review, 2012.
7. Zhang K., **H. Liu**, Y. Li, H. Xu, J. Shen, J. Rhome and T.J. Smith III, *The Role of Mangroves in Attenuating Storm Surges*, Estuarine, Coastal and Shelf Science, 102-103, 11-23, 2012.
8. Xie, L., **H.Liu**, B. Liu and S. Bao, *A Numerical Study of the Effect of Hurricane Wind Asymmetry on Storm Surge and Inundation*, Ocean Modelling, Vol. 36, Issues 1-2, 71-79, 2011.
9. Liu,B., **H.Liu**, L.Xie, C.Guan and D.Zhao, *A Coupled Atmosphere-Wave-Ocean Modeling System: Application to Tropical Cyclone Intensity Simulation*, Monthly Weather Review, Vol. 139,132-152, 2011.
10. Xie, L., B. Liu, **H. Liu** and C. Guan, *Numerical Simulation of Tropical Cyclone Intensity Using an Air-Sea-Wave Coupled Prediction System*, Accepted, Advances in Geophysics (AOGS2008 Special Issue), 2009.
11. **Liu, H.** and L. Xie, *A numerical study on the effects of wave-current-surge interactions on the height and propagation of sea surface waves in Charleston Harbor during Hurricane Hugo 1989*, continental Shelf Research, 2009, doi: 10.1016/j.csr.2009.03.013.
12. Liu, Z., D. Hu and **H. Liu**, *On the fluctuations and vertical structure of the shelf currents in the southern Yellow Sea*, *The Yellow Sea*, Vol. 9, No. 1, 1-7, 2008.

13. Xie, L., **H. Liu** and M. Peng, *A numerical study on the effect of wave-current interactions on the storm surge and inundation associated with Hurricane Hugo 1989*, *Ocean Modelling*, Vol. 20, 252-269, 2008.
doi:10.1016/j.ocemod.2007.10.001
14. **Liu, H.**, L. Xie, L. J. Pietrafessa and S. Bao, *Sensitivity of Wind Waves to Hurricane Wind Characteristics*, *Ocean Modelling*, Vol. 18, 37-52, 2007.
15. M. Peng, L. Pietrafesa, S. Bao, **H. Liu**, M. Xia, and T. Yan, **LIDAR vs. GEODAS Land Elevation Data in Hurricane Induced Inundation Modelling**, *Ocean Science*, accepted 2007.
16. Pietrafesa, L. J., K. Kelleher, T. Karl, M. Davidson, M. Peng, S. Bao, D. Dickey, L. Xie, **H. Liu** and M. Xia, *A new architecture for coastal inundation and flood warning prediction*, *Marine Technology Society Journal*, Winter 2006/2007, Vol. 40, No. 4, 71-77.
17. Pietrafesa, L. J., E. B. Buckley, M. Peng, S. Bao, **H. Liu**, S. Peng, L. Xie, D.A. Dickey, *On Coastal Ocean Systems, Coupled Model Architectures, Products and Services: Morphing from Observations to Operations and Applications, Stemming the Tide of Coastal Disasters, Part 2*, *Marine Technology Society Journal*, Spring 2007, Vol. 41, No. 1.
18. **Liu, H.**, L. Xie, L.J. Pietrafessa and M. Peng, *Effect of ocean surface waves on storm surge and coastal flooding*, Extended Abstract, the 27th Conference on Hurricanes and Tropical Meteorology, 2006.
19. Tian, J., **H., Liu** and W., Qian, *A dipole mode at thermocline layer in the tropical Indian Ocean*, *ACTA OCEANOLOGICA SINICA*, vol 22, No,1,15-25,2003.