Ranjani W. Kulawardhana, PhD
Assistant Professor (Environmental Science/ Remote Sensing & GIS)
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PROFESSIONAL PREPARATION

PhD. 2013 **Ecosystem Science & Management -** Texas A&M University, Texas, USA
Dissertation title**:** Quantification of salt marsh carbon stocks: Integration of remote sensing data (lidar and multispectral) and techniques with field measurements (**GPA**: 3.82)

MSc. 2005 **Integrated Water Resources Management -** Postgraduate Inst. of Agriculture, Sri Lanka
Dissertation title: Determination of spatial and temporal variations of vegetation cover, land surface temperature, rainfall, and their relationships observed in natural vegetation of Sri Lanka using NOAA AVHRR data (**GPA:** 3.88)

BSc. 2002 **Agriculture** – Faculty of agriculture, University of Peradeniya, Sri Lanka
Dissertation title*:* Effects of organic tea cultivation on soil microbial biomass (**GPA:** 3.35)

RESEARCH INTERESTS

- Wetland & Coastal Ecology
- Ecosystem health, productivity & carbon cycling
- Impacts of natural and human-induced disturbance on natural and managed ecosystems
- Remote Sensing & GIS for vegetation and land cover analysis

PROFESSIONAL EXPERIENCE

- Assist. Prof. of Environmental Sci., Dept. of Biology, Jackson State University, Jackson MS - 2014 (Aug) – Present
- Postdoctoral Research Associate, Spatial Sciences Lab, Texas A&M University, College Station, TX - 2014 (Feb – July)
- Graduate Research/ Teaching Assist., Dept. of Ecosystem Sci. & Mngt, Texas A&M University, College Station, TX - 2009 – 2013
- Research Scientist, International Water Management Institute, Colombo, Sri Lanka - 2005 - 2008

PUBLICATIONS

Peer-review publications (only the most recent & relevant publications are listed)

1. Gulledge, E. M., Taimei, T. H., Han F. X., **Kulawardhana, R. W**., & Tchounwou, P. B. **2017**. Carbon sequestration ability of coastal wetland ecosystems of Gulf of Mexico: a review. AIMS Environmental Science, (in review)
2. **Kulawardhana, R. W**., Popescu, S. C. & Feagin, R. A. **2017-** *in press*). Airborne lidar remote sensing applications in non-forested short stature environments: a review. Annals of Forest Research. DOI:10.15287/afr.2016.719
3. **Kulawardhana, R. W**., Feagin, R. A., Popescu, et al. (**2015**). The role of elevation and relative sea level history in determining carbon distribution in *Spartina alterniflora* dominated salt marshes. Estuarine Coastal and Shelf Science. http://dx.doi.org/10.1016/j.ecss.2014.12.032
4. **Kulawardhana, R. W**., Popescu, S. C. & Feagin, R. A. (**2014**). Fusion of lidar and multi-spectral data to quantify saltmarsh carbon stocks. Remote Sensing of Environment. http://dx.doi.org/10.1016/j.rse.2013.10.036
5. Bianchi T.S., Allison M. A., Zhao J., Li X., Comeaux R. S., Feagin R. A. & **Kulawardhana R. W**. **2013**. Historical reconstruction of mangrove expansion in the Gulf of Mexico: Linking climate change with carbon sequestration in coastal wetlands. Estuarine, Coastal and Shelf Science. http://dx.doi.org/10.1016/j.ecss.2012.12.007
6. Hideto F., Busia D., **Kulawardhana R. W**., et al. **2011**. Features of river flow in inland valleys in semi-deciduous forest zone in Ghana. Transactions of the Japanese Society of Irrigation, Drainage and Rural Engineering, 77 (6), 637-644. https://www.jstage.jst.go.jp/article/jsidre/77/6/77_6_637/_pdf
7. Islam Md. A., Thenkabail P. S., **Kulawardhana, R. W**. et al. **2008**. Semi-automated methods for mapping wetlands using Landsat ETM+ and SRTM data, International Journal of Remote Sensing. http://dx.doi.org/10.1080/01431160802235878
8. **Kulawardhana, R. W**., Thenkabail, P. S., Vithanage, J., et al. **2007**. Evaluation of the Wetland Mapping Methods using Landsat ETM+ and SRTM Data. Journal of Spatial Hydrology (JoSH), 7(2): 1530-4736. http://spatialhydrology.net/index.php/JOSH/article/view/73/72

Proceeding papers

1. **Kulawardhana R. W**., Washington-Allen, R. A., Popescu S. C., et al. **2012**. Regional scale assessment of rangelands degradation and its key drivers using remotely sensed vegetation net primary productivity data. Proceedings of the 4th Int. Conference on Geo-Information Technology for Natural Disaster Management. November 7-8, Colombo, Sri Lanka
2. Washington-Allen R. A., **Kulawardhana R. W**., Reeves M. C. & Mitchell J. E. **2011**. The impact of livestock grazing on US dryland productivity from 2000 to 2006. Proceedings of the IX International Rangeland Congress, Diverse Rangelands for a Sustainable Society, April 2 – 8, 2011, Rosario, Argentina
3. **Kulawardhana R. W**., Thenkabail P.S., Masiyandima M., et al. **2006**. Evaluation of different methods for delineation of wetlands in the Limpopo river basin using Landsat ETM+ and SRTM data. Proceedings of the first Globwetland Symposium: Looking at wetlands from space, October 19 – 20, 2006, Frascati, Italy.

Book Chapters

1. Reeves M, Angerer J, Hunt ER, **Kulawardhana R. W**, et al.**2015**. A Global View of Remote Sensing of Rangelands: Evolution, Applications, Future Pathways. In Remote Sensing Handbook. Volume II: Land Resources: Monitoring, Modeling, and Mapping (Thenkabail, P.S. ed.). Boca Raton, FL: CRC Press/Taylor & Francis Group.

Book reviews

1. **Kulawardhana R. W. 2013**. Review on the book "Environmental Remote Sensing and Systems Analysis, ed. Ni-Bin Chang, CRC Press, NY". International Journal of Photogrammetric Engineering and Remote Sensing. Photogrammetric Engineering and Remote Sensing, 79, 508-603.
2. **Kulawardhana R. W. (2012)**. Review on the book "Remote sensing and GIS technologies for monitoring and prediction of disasters, ed. Shailesh Nayak and Sisi Zlatanova, Oxford, NY, Springer". International Journal of Digital Earth, 4, 539 – 541.
3. **Kulawardhana R. W. (2011)**. Review on the book "Remote sensing of vegetation: principles, techniques and applications by Hamlyn G. Jones and Robin A Vaughan, Oxford University Press, Oxford, NY". Journal of Vegetation Science, 22, 1–3.

PRESENTATIONS

Paper presentations

1. **Kulawardhana R. W**., Harris T.T., Gulledge E. M., Han F. X. & Tchounwou P. B. **2016**. Impacts of natural- and human-induced disturbances on Estuarine Wetland Ecosystems: Case study from Grand Bay National Estuarine Research Reserve (NERR). NOAA EPP/MSI 8th Biennial Education and Science Forum Mississippi, USA, Aug. 29-31, New York, USA
2. **Kulawardhana R. W.**, Harris T.T., Gulledge E. M., Feagin R. A. & Tchounwou P. B. **2016**. Land-use/ land-cover (LULC) change modelling using medium to very high resolution satellite remote sensing data to evaluate natural and human induced impacts on estuarine wetland ecosystems of Grand Bay National Estuarine Research Reserve (NERR) of Mississippi. International Society for Ecological Modelling Global Conference, May 8-12, Maryland, USA
3. **Kulawardhana R. W**., Harris T.T., Gulledge E. M. & Tchounwou P. B. **2016**. Wetland land-use/land-cover changes as affected by natural and human-induced disturbance regimes. 80th Annual Mississippi Academy of Sciences Meeting, February 18-19, Hattiesburg, MS, USA
4. **Kulawardhana R. W.,** Tchounwou P. B., Gulledge E. M., Harris T. T., Mbemi A., McDowell J. & McDowell R. **2015**. Geospatial analytical techniques for the study of changing ecosystems and their effects on ecosystem health, conditions and human health. 12th International Symposium on Recent Advances in Environmental Health Research, September 13-16, Jackson, MS, USA
5. **Kulawardhana R. W**., Feagin R. A., Popescu S. C., Boutton T. W. & Tchounwou P. B. **2015**. The role of elevation, relative sea level history, and land cover conversions in determining carbon distributions in *Spartina alterniflora* dominated salt marshes in Galveston, Texas, Third International Conference on Oceanography, June 22-24, 2015, Philadelphia, Pennsylvania, USA
6. Washington-Allen R. A., March, R. G., Mcnelis J.J., Roberts J. R., Seiden, Z. T., **Kulawardhana R W**., Reeves, M. C., & Mitchell, J. E. **2015**. Examining the causes of US dryland "greening" and their relationships to commercial livestock grazing using time series of LST and NPP satellite data. Third Scientific Meeting of the United Nations Convention to Combat Desertification (UNCCD), March 9 - 12, 2015, Cancun, Mexico.

7. Washington-Allen R. A., McNelis J., Joseph R., Zachariah S., **Kulawardhana** R. W., Reeves M. C. & Mitchell J. **2014**. How much of US Dryland's carbon stocks is being appropriated by commercial grazing livestock. AGU Fall Meeting, Dec 15 – 19, 2014, San Francisco, California, USA
8. **Kulawardhana R. W.**, Feagin R. A., Popescu S. C. & Boutton T. W. **2014**. Salt marsh carbon distributions as affected by relative sea level history and land cover conversions: Case study using remote sensing based estimates in *Spartina alterniflora* dominated salt marshes in Galveston, Texas. Eleventh International Symposium on Recent Advances in Environmental Health Research, September 14-18, Jackson, MS, USA**.**
9. **Kulawardhana R. W**., Feagin R. A. & Popescu S. C. **2014**. Role of elevation and relative sea level history in determining carbon distribution in *Spartina alterniflora* dominated salt marshes. Annual Conference of ASPRS, March 23-28, 2013, Louisville, Kentucky USA –*Lightning talk*
10. **Kulawardhana R. W**., Popescu S. C. & Feagin R. A. **2014**. Fusion of LiDAR and multi-spectral data to estimate elevation, vegetation height and biomass in herbaceous salt marsh environments. International LiDAR Mapping Forum (ILMF). February 17-19, Denver, Colorado, USA – University featured presentation
11. **Kulawardhana R. W**., Feagin R. A. & Popescu S. C. **2013**. Spatial and temporal variation in carbon deposition in a Galveston, Texas salt marsh: The role of elevation and relative sea level history. AGU Fall Meeting, Dec 9 – 13, 2013, San Francisco, California
12. **Kulawardhana R. W**., Popescu S. C. & Feagin R. A. **2013**. Fusion of LiDAR and multi-spectral data to quantify carbon stocks in Galveston saltmarshes. Annual Conference of ASPRS, March 24-29, 2013, Baltimore, Maryland, USA
13. **Kulawardhana R. W**., Popescu S. C. & Feagin R. A. **2013**. Characterization of salt marsh vertical structure using airborne LiDAR and spectral data. 14th Ecological Integration Symposium of the Texas A & M University: From theory to practice - ecology and its application. March 22-23, College Station, Texas, USA
14. **Kulawardhana R. W**., Popescu S. C. & Feagin R. A. **2012**. LiDAR based vegetation height models to quantify carbon stocks in Galveston saltmarshes. AGU Fall Meeting, December 3-7, 2012, San Francisco, California, USA
15. **Kulawardhana R. W**., Popescu S. C., Feagin R. A., Reeves M. C. & Washington-Allen R. A. **2012**. Degradation assessment of Texas rangelands using 28 year data records of vegetation net primary productivity, precipitation and Temperature. Fourth International Conference on Geo-Information Technology for Natural Disaster Management. November 7-8, 2012, Colombo, Sri Lanka
16. Washington-Allen R. A., Ramsey R. D., West N. E., **Kulawardhana R. W.,** Reeves M. C., Mitchell J. E. & Van Niel T. G. **2011**. Local to global scale time series analysis of US dryland degradation using Landsat, AVHRR, and MODIS. AGU Fall Meeting, December 5 – 9, 2011, San Francisco, California
17. Washington-Allen R. A., **Kulawardhana R. W**., Reeves M. C. & Mitchell J. E. **2011**. Impact of livestock grazing on US dryland productivity from 2000 to 2006. Proceedings of the IX International Rangeland Congress, Diverse Rangelands for a Sustainable Society, April 2 – 8, 2011, Rosario, Argentina

Poster Presentations

1. Feagin R. A., **Kulawardhana R. W.**, Hinson, A. L., Popescu, S. C., Bianchi, T. S., Yeager, K. M., Najjar, R. G., Kroeger, K. D., Windham-Myers L. **2015**. Spatial quantification of blue carbon at landscape and continental scales. NASA Carbon Cycle & Ecosystems Joint Science Workshop. April 20-24, 2015, College Park, Maryland, USA
2. Popescu S. C., Sheridan R., Zhao K., Ku N., Vogel J., Moore G., Feagin R. A., **Kulawardhana R. W. 2015**. Lidar remote sensing of vegetation canopy structure and biophysical parameters at multiple scales. NASA Carbon Cycle & Ecosystems Joint Science Workshop, April 20-24, 2015, College Park, Maryland, USA
3. Feagin R, **Kulawardhana R. W**, Popescu S, Bianchi T, Yeager K, Najjar R, Kroeger K, Windham-Myers L. **2015**. Spatial quantification of blue carbon at landscape and continental scales. North American Carbon Program Conference 2015, Jan 26-29, Washington, DC.
4. **Kulawardhana R. W**., Feagin R. A., Popescu S. C. & Tchounwou P. B. **2014**. Carbon distributions in *Spartina alterniflora* dominated salt marshes in Galveston, Texas: The role of elevation, relative sea level history, and land cover conversions. AGU Fall Meeting, Dec 15 – 19, 2014, San Francisco, California

5. **Kulawardhana R. W**., Washington-Allen R. A., Popescu S. C. & Reeves M. C. **2013**. Pixel based regression model to characterize vegetation NPP of US rangelands over the period from 1982 to 2009. Spatial Statistics Conference, June 4-7, 2013, Columbus, Ohio, USA
6. **Kulawardhana R. W**., Popescu S. C. & Feagin R. A. **2013**. Vegetation height models to characterize salt marsh vertical structure using airborne LiDAR. International LiDAR Mapping Forum (ILMF), February 11-13, Denver, Colorado, USA
7. **Kulawardhana R. W.,** Washington-Allen R. A., Mitchell J. E. & Reeves M. C. **2012**. Degradation Assessment of Texas Rangelands using 28 year data records of vegetation net primary productivity. 13th Ecological Integration Symposium of the Texas A & M University: Ecology in a Changing World. March 23-24, 2012, College station, Texas, USA
8. **Kulawardhana R. W.,** Washington-Allen R.A., Eric S, Austin M. A., Popescu S., Reeves M. C & Mitchell J. E., **2011**. A 28-year dataset to characterize vegetation productivity of US rangelands. AGU Fall Meeting, December 5 – 9, 2011, San Francisco, California
9. **Kulawardhana R. W**., Washington-Allen Eric S, Austin M. A., Popescu S., Reeves M. C & Mitchell J. E., **2011**. Vegetation productivity of US rangelands over a 28 year period from 1982 to 2009. 96th Annual Meeting of Ecological Society of America, August 7 – 12, 2011, Austin, Texas
10. Washington-Allen R. A., **Kulawardhana R. W**., Reeves M. C & Mitchell J. E., **2011**. Is commercial livestock grazing a driver of the observed net carbon gain in US Drylands? 96th Annual Meeting of Ecological Society of America, August 7 – 12, 2011, Austin, Texas
11. Washington-Allen R. A.; **Kulawardhana R. W**.; Reeves M. C.; Mitchell J. E. **2010**. The Impact of Livestock Grazing on US Rangeland Productive Capacity from 1981 to 2009. AGU Fall Meeting, Dec 13 – 17, 2010, San Francisco, California
12. **Kulawardhana R. W.,** Washington-Allen R. A., Mitchell J. E. & Reeves M. C. **2009**. Regional and national scale assessment of the impact of US livestock footprint on dryland productive capacity. AGU Fall Meeting, Dec 14 – 18, 2009, San Francisco, California
13. **Kulawardhana R. W**., Thenkabail P.S., Masiyandima M., Biradar C.M., Vithanage J., Finlayson M., Gunasinghe S. & Alankara R. **2006**. Evaluation of different methods for delineation of wetlands in the Limpopo river basin using Landsat ETM+ and SRTM data. First Globwetland Symposium: Looking at wetlands from space, Oct 19 - 20, 2006, Frascati, Italy

Student Presentations

1. Harris T.T., **Kulawardhana R.W**., Gulledge E. M., Han F. X. & Tchounwou P. B. **2016**. Spatial patterns and temporal dynamics of *Juncus roemerianus* dominated wetland vegetation characteristics and carbon stocks of Grand Bay National Estuarine Research Reserve, Mississippi. NOAA EPP/MSI 8th Biennial Education and Science Forum, Aug 29-31, New York, USA.
2. Mbemi A. **Kulawardhana R. W**. & Sylvianne N. **2015**. Predictive geographic incidence of human West Nile Virus in Mississippi USA and its' correlation to precipitation trends. 12th International Symposium on Recent Advances in Environmental Health Research, Sept. 13-16, Jackson, MS, USA
3. Gulledge E. M., **Kulawardhana R. W**., Harris T. T., Johnson T. K., Han F. X. & Tchounwou P. B. **2015**. Wetland Land-Use/Land-Cover (Lulc) changes in the Grand Bay National Estuarine Research Reserve of Mississippi, USA: Remote Sensing based Approach. 12th International Symposium on Recent Advances in Environmental Health Research, Sept. 13-16, Jackson, MS, USA
4. McDowell R., **Kulawardhana R. W**. & McDowell J. **2015**. Land use change, and shifting deforestation and urbanization patterns in the Jackson metropolitan area between 1992 and 2011. 12th International Symposium on Recent Advances in Environmental Health Research, Sept. 13-16, Jackson, MS, USA
5. Harris T. T., **Kulawardhana R. W**., Gulledge E. M., Han F. X., & Tchounwou P. B. **2015**. Vegetation Characteristics and carbon storage ability of estuarine wetland ecosystems of Mississippi: A case study from the Grand Bay National Estuarine Research Reserve. 12th International Symposium on Recent Advances in Environmental Health Research, Sept. 13-16, Jackson, MS, USA
6. Gulledge E. M., **Kulawardhana R. W**., Han F. X. & Tchounwou P. B. **2014**. Characterization of soil carbon pools of Grand Bay National Estuary Reserve Wetland ecosystems. 11th International Symposium on Recent Advances in Environmental Health Research, Sept. 14-18, Jackson, MS, USA**.**
7. Harris T. T., **Kulawardhana R. W**., Han F. X. & Tchounwou P. B. **2014**. Wetland biomass and carbon storage in the Grand Bay National Estuary Reserve: Evaluation of their potential contributions as soil carbon sinks and for the mitigation of global warming. 11th International Symposium on Recent Advances in Environmental Health Research, Sept. 14-18, Jackson, MS, USA**.**

GRANTS

- **NOAA Center for Coastal and Marine Ecosystems** – Funded by NOAA Educational Partnership Program – Co-PI (PI - Larry Robinson, Florida A&M University; Institutional PI – Timothy Turner, Dept. of Biology; $15.4 million for 5 years (sub-award to JSU: $1.37 million)
- **Mississippi Storm and Flooding Ecosystem Responses – Coastal Environment Evaluation Strategies (MS SAFER CEES) Working Group** – Funded by Mississippi Research Consortium – Co-PI (PI – Patrick Biber, University of Southern Mississippi Gulf Coast Research Laboratory; 6K for 1 year)
- **Mississippi's RESTORE Act Center of Excellence** – Funded by MDEQ – Co-PI (PI – Landry Bernard, University of Southern Mississippi; 400K for 5 years)
- **GEMS: Geoscience Excellence for Minority Students** – Proposal submitted to NSF GEOPATHS – Co-PI (PI – Ezat Heydari, JSU; Funding requested 600K for 3 years)

TEACHING (at JSU)

Wetland Ecology (ENV 803); Introduction to Remote Sensing for Environmental Science (ENV 717); Application of Remote Sensing in Environmental Science (ENV 718); Ecology (BIO 423/ 523); Ecology Lab (BIOL 423/ 523; Introduction to Marine and Environmental Science (BIO 114); General Biology (BIO 111)

STUDENT MENTORING

- Co-chair: Taimei Harris & Eric Gulledge (2013 – 2017 - Env. Sci. PhD students at JSU)
- Chair: Ashley Acuna & Jennifer Blanks (2015 – 2017 – Env. Sci. MSc. Students at JSU)
- Faculty Mentor: Trenton Johnson (Summer 2015 – STEM Undergraduate Intern at JSU)

AWARDS/ FELLOWSHIPS/ HONORS

- Schlumberger Faculty for Future Fellowship (2012/2013; 2013/2014), Schlumberger Foundation, USA
- Tom Slick Senior Graduate Fellowship (2012/2013), College of Agriculture and Life Sciences, TAMU
- Unilever Ceylon Water Professional's Fellowship (2003/2004), Postgraduate Institute of Sri Lanka
- Presidential awards in scientific research -2008/2009, National Research Council of Sri Lanka
- Travel Award ($1500) - Fall 2014 - Center for University Scholars, Jackson State University
- Travel Award ($300) - Fall 2012 - Texas A&M Graduate Student Council
- Travel Award ($ 500 each) - Fall 2009 & Summer 2010 - Dept. of ESSM, TAMU

PROFESSIONAL AFFILIATIONS

- Working Group Member, NOAA National Centers for Coastal Ocean Science (NCCOS)
- Faculty Member, NOAA Center for Coastal and Marine Ecosystems (NOAA CCME)
- Faculty Member, NOAA Environmental Corporative Science Center (NOAA ECSC)
- Associate Faculty Member, Graduate Faculty, Jackson State University
- Academy Scholar, Research and Scholarly Engagement Academy, Jackson State University

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- International Gamma Sigma Delta (GSD) Agricultural Honor Society
- American Society for Photogrammetry and Remote Sensing (ASPRS)
- American Association for the Advancement of Science (AAAS)
- Ecological Society of America (ESA)
- American Geophysical Union (AGU)

PROFESSIONAL SERVICES

Editorial board member, Annals of Forest Research

Invited panelist

- NOAA's Center for Sponsored Coastal Ocean Research program 2016/ 2017 proposals
- EPA STAR 2015/ 2016 Graduate Fellowship Research proposals
- NASA ROSES 2014/ 2015 research proposals

Invited paper reviewer:

ISPRS Journal of Photogrammetry and Remote Sensing, Estuarine Coastal and Shelf Sciences, ISPRS International Journal of Geo-Information, Journal of Coastal Research, Remote Sensing, Subtropical Agriculture and Environment, Journal of Sustainability, Landscape and Urban Planning

PROFESSIONAL CERTIFICATIONS

- Graduate Certificate in Remote Sensing - Texas A&M University
- Graduate Certificate in GIS - Texas A&M University