Review of UH Academic Centers and Institutes for FY 2015

Information and Contacts:

Center or Institute Name: University of Houston Coastal Center

Year Established: 1968

Website Address (url): http://www.uhcc.uh.edu/

Director:

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12/31/2015 — Date

University of Houston Coastal Center
Annual Report for 2014-2015

Introduction and historical context

The University of Houston Coastal Center (UHCC) was formally established by President Hoffman in 1968. From 1976 to 2010, it was administered by Dr. Glenn Aumann. During Dr. Aumann's tenure, the primary missions of the UHCC were support of graduate students (in the form of small grants) and support of research (by providing access to pristine prairie and large open spaces as needed). During this time, the UHCC did not capture IDC return from funded projects, and it operated as a free University facility.

Drs. Steven Pennings (Biology and Biochemistry) and Barry Lefer (Earth and Atmospheric Sciences) assumed responsibility for administration of the UHCC in September 2010, with Pennings serving as Director and Lefer as Assistant Director. A five-year strategic plan for the UHCC was developed in 2010 following discussions with Dr. Birx, Vice President for Research. This plan emphasized growing the externally-funded research mission of the UHCC. Subsequent direction from the Vice President for research emphasized the importance of diversifying the user base among multiple colleges.

Over the following four years, University-wide budget cuts, coupled with repeated turnover in leadership and vision at the Division of Research, made the 2010 plan irrelevant. Pennings and Lefer continued to recruit new faculty to work at the UHCC and to pursue opportunities for the institute. In September 2014, the Vice President for Research and the Dean of the College of Natural Sciences and Mathematics agreed that the UHCC would start reporting to NSM instead of DOR. At the same time, an audit revealed that the original UHCC center paperwork from 1968 had been lost. Dr. Guoquan Wang (Earth and Atmospheric Sciences) replaced Dr. Lefer as Assistant Director in 2015.

Pennings and Wang are currently directing the UHCC while working with the Dean of NSM to develop a new funding and strategic plan that provides a measure of long-term stability for the operations of the UHCC. A proposal to (re-)create the UHCC as an academic center reporting to the Dean of NSM was approved by the UH Committee on Academic Centers and Institutes on November 17, 2015, but has not yet been approved by the Provost, and the UHCC does not have sufficient funds committed to support its one staff person beyond 2016. At the same time, use of the facility for research and education continues to increase.

B. Goals and objectives

The goals of the UHCC are to 1) develop a facility that meets the needs of environmental scientists for field sites, equipment and facilities, 2) develop a facility that meets the needs of environmental educators for field courses and informal educational

activities, 3) develop a facility that provides the unique opportunity for environmental service activities benefitting Houston, Texas and the nation, and 4) foster productive collaborations among those using the UHCC.

The primary objectives over recent years have been to 1) increase the number of faculty working at the UHCC, 2) diversify the user base among multiple colleges, 3) increase the number of academic courses using the UHCC, 4) hold annual meetings of advisors and users to foster interactions centered on the UHCC, and 5) develop a new funding and strategic plan that provides long-term stability for the operations of the UHCC.

C. Mission

The primary mission of the UHCC is to support environmental research on the Texas coast by providing researchers with access to field sites, equipment and facilities. A secondary mission of the UHCC is to conduct service and educational activities related to the environment.

The UHCC is the only field laboratory serving the University of Houston. It provides a unique and essential facility for faculty doing environmental research, because it provides large areas of land (~1,000 acres) where equipment or experiments can be deployed, it provides access to a highly-endangered natural habitat (pristine coastal prairie), and the equipment and experiments are fairly secure because the UHCC property is partially fenced and has a caretaker who lives on site.

By preserving a large stand of pristine coastal prairie, the UHCC is also serving the nation at large. Coastal prairie is a highly endangered habitat (less than one tenth of one percent remains), and the prairie at the UHCC is one of the highest quality prairies (as assessed by plant diversity) in the nation. Conservation NGOs and State and Federal agencies are highly aware of the conservation value of the prairie at the UHCC, and regularly express concern to the director about the long-term stability of the property.

The UHCC also provides an ideal location for field courses taught by Earth and Atmospheric Sciences and by Biology and Biochemistry. The UHCC provides access to equipment and field sites coupled with immediate access to an air-conditioned building that has laboratory space and restrooms. Work can be done outside, but it is easy to retreat inside if rain or high temperatures require it.

The UHCC may provide an ideal location for field courses in petroleum engineering, because we host wells from two oil companies on our property. We are exploring this possibility.

Finally, the UHCC provides a unique venue for outreach and service activities related to the environment. In particular, we work closely with groups that are restoring coastal prairie habitat by providing a seed supply. The high diversity of the vegetation at the UHCC makes seed from our facility more desirable for restoration than seed from other prairie sites.

Few of the activities conducted at the UHCC could be moved to other UH properties, and the natural habitat itself is irreplaceable.

D. Metrics

The 2010 Strategic Plan for the UH Coastal Center set out goals for increasing external funding that were based on the assumption that DOR would continue previous strong levels of support for the UHCC. Over the following four years, University-wide budget cuts that severely affected the UHCC, coupled with repeated turnover in leadership and vision at the Division of Research, and the eventual transfer of the UHCC from DOR to NSM, have made the 2010 plan irrelevant. We are working with the NSM Dean to develop a new strategic plan for the UHCC that reflects our new reporting structure and funding situation. The immediate goal is to obtain funding commitments for a three-year period sufficient to support the UHCC caretaker and basic maintenance. For the moment, we are broadly tracking research, education and service activity as our metrics.

E. UH Participants and level of participation

College of Natural Sciences and Mathematics

Department of Earth and Atmospheric Sciences

Regina Capuano (hydrology). Currently inactive.
Shuhab Khan (field course). Currently inactive.
James Flynn (atmospheric science). Active.
Barry Lefer (atmospheric science). Active.
Bernhard Rappenglueck (atmospheric science). Active.
Jon Snow (arctic hard rocks). Currently inactive.
Robert Stewart (geophysics, field courses). Active.
Robert Talbot (atmospheric sciences). Active.
Bob Wang (geophysics). Active.

Department of Biology and Biochemistry

Ann Cheek (field course). Active.
Kerri Crawford (ecology). Active.
Christopher Gabler (ecology). Active.
Marc Garbey (modeling). Active.
Angela Laws (ecology). Active
Steven Pennings (ecology). Active.
Diane Wiernasz (ecology). Active.
Larry Williams (field course). Active.

College of Architecture

Patrick Peters (graduate design). Active.

College of Education

Wallace Dominey (environmental education). Active.
John Ramsey (environmental education). Open to opportunities.
Sissy Wong (environmental education). Open to opportunities.

Cullen College of Engineering

Petroleum Engineering program. Interest in two active oil wells on UHCC property.

Effectiveness. The UHCC is providing a valuable resource to faculty in NSM, with use for research, education and outreach steadily increasing. We have engaged faculty in Architecture whose courses will assist with renovation scenarios for the UHCC. The UHCC is potentially a valuable resource for faculty in Education, but current use is in the early stages. The UHCC is potentially an extremely valuable resource for faculty in Petroleum Engineering, but they are overwhelmed trying to set up their new program, and we have not yet been able to develop this potential.

F. Outside Interactions

Academic

Radford University. Chelse Prather (ecology). Active.
Rice University: Evan Siemann (ecology). Currently inactive.
San Jose State University: Craig Clements (fire research). Active.
Texas A&M: Charles Criscione (parasite life history). Active
University of Houston Downtown: Michael Tobin (course field trips). Active.
University of New Mexico: Jennifer Rudgers (plant ecology). Active.
University of New Mexico: Ken Whitney (experimental evolution). Active.

Conservation

Native American Seed: annual seed harvests. Active.
Coastal Prairie Partnership: research, conservation, education. Active.
Texas Master Naturalists: regular seed harvests. Active.

Effectiveness. The UHCC is providing a valuable resource to a number of outside groups. In particular, we provide a valuable research site for several NSF-funded projects from outside universities, and an extremely valuable source of seed for prairie restoration in Texas and Louisiana. There is strong community interest in the UHCC, and we would be able to do considerably more outreach activities than we currently do if we had the necessary staff.

G. Role of the Institute

Within UH

The UH Coastal Center serves a number of UH faculty, primarily in NSM, who need the space or habitats uniquely provided by the UHCC (Section E).

Regional

The UHCC serves conservation organizations in the Texas and Louisiana area by providing tours and seed for prairie conservation (Section F).

National

The UHCC serves faculty in the Houston area and nationally who need the space or habitats provided by the UHCC (Section F).

The UHCC serves the nation by conserving a pristine parcel of high-quality coastal prairie, a habitat type that is highly endangered (Section C).

Other units

The UHCC is the only field laboratory serving the University of Houston. Few of the activities conducted at the UHCC could be moved to other UH properties, and the natural habitat itself is irreplaceable.

Students

Graduate and undergraduate students are active at the UHCC through the research programs in faculty laboratories, and through courses that utilize the UHCC.

H. Anticipated Changes

We are working with the NSM Dean to develop a new strategic plan for the UHCC that reflects our new reporting structure and provides long-term stability for the UHCC. A proposal to (re-)create the UHCC as an academic center reporting to the Dean of NSM was approved by the UH Committee on Academic Centers and Institutes on November 17, 2015, but has not yet been approved by the Provost, and the UHCC does not have sufficient funds committed to support its one staff person beyond 2016.

Pennings and Wang are continuing to recruit new faculty to conduct research, education and service activities at the UHCC.

The UHCC was awarded some deferred maintenance funds that will support some physical plant work in 2016. The goal is to paint the exterior, replace exterior doors, and renovate the bathrooms which are currently not ADA compliant.

In 2015, we submitted a FSML (Field Stations and Marine Laboratories) proposal to NSF that would support renovations of some of the laboratory space at the UHCC. This proposal was not funded, but we obtained useful feedback from the reviewers and NSF program officer, and will resubmit in January of 2016.

I. Current Measures of Performance

(1) Personnel. The UHCC does not have an official membership process (a formal membership process is part of the proposal to (re-)create the UHCC that is currently under review). A list of faculty who use the UHCC or are interested in doing so is provided in section E. We don't track how many postdocs or students from these labs are active at the UHCC. The UHCC has a single full-time staff person (Mr. Tim Becker) who is responsible for maintenance, security, grounds-keeping, janitorial duties, and providing logistical support to research operations.

(2) Funding.

Category	**2014-2015 income**	**Comments**
Support from OVPR	$35,650	
IDC return	$4,217	Variable among years.
Seed sales	$2,638	Highly variable among years.
Soil sales	$58,438	Sale of spoil from ditch work to adjacent developer. It is highly unlikely that we will be able to do this again in the future—it was a one-time opportunity.
User fees	0	Variable among years, usually < $500
Total	$98,305	

(3) Contracts and Grants. The UHCC does not directly receive grants; rather, faculty with grants through their departments work at the facility. A list of awards for projects active at the UHCC follows.

Awards Active during 2014-5 ($3,465,680.00 to UH)

PI: Kerri Crawford. Sand dune restoration: Do plant diversity and soil microbial amendments enhance ecosystem services? Texas Sea Grant: 1/2016 to 1/2018, $238,600.

PI: Chelse Prather. Pennings is Senior Personnel and UH subcontract lead. Are micronutrients important in structuring plant and herbivore communities? A test in coastal tallgrass prairie. NSF. 2015-2018. $271,662 to UH.

PI: Angela Laws. Senior personnel: CM Prather, M Strickland, J Jonas, D Bransen, A Joern, S Pennings. Is a diverse grasshopper community beneficial to the health and functioning of rangeland ecosystems? USDA. 2015-2018. $150,000.

PI: Jennifer Rudgers. COLLABORATIVE RESEARCH: Parsing the effects of host specificity and geography on plant-fungal symbioses under climate change. NSF: 2015-2019. $1,089,147 (not included in UH total funding).

PI: Wallace Dominey. Pennings is instructional team member. University of Houston Regional Collaborative for Excellence in Science Teaching, Source of Support: Texas Regional Collaboratives for Excellence in Science Teaching (University of Texas- Austin), Award Period: 05/01/2014- 07/30/2015, Award UTA14-000418, UH G108230, Award Amount: $210,000

PI: Wallace Dominey. Pennings is instructional team member. University of Houston Regional Collaborative for Excellence in Science Teaching, Source of Support: Texas Regional Collaboratives for Excellence in Science Teaching (University of Texas- Austin), Award Period: 05/01/2015- 07/30/2016, Award UTA15-000261, UH G109772, Award Amount: $164,901

PI: James Flynn (100%), “Monitoring Related to Ozone Formation in and Particulate Matter Transport into the Houston Region” (G109975) Texas Commission on Environmental Quality [$312,859] April 2015 – June 2016.

PI: James Flynn (100%), “Characterization of Background PM2.5 and NOx north of the Houston Metropolitan Area” (G110066) Texas Commission on Environmental Quality [$289,000] February 2015 – August 2016.

PI: Barry Lefer (50%), Co-PI: James Flynn (50%), “Analysis and Presentation of Spatial and Temporal Variability of NO2 and O3 in Support of DISCOVER-AQ Houston” (G109273) NASA [$49,999] December 2014 – December 2015

PI: Steven Pennings and Anna Armitage. Mangroves are invading Texas salt marshes: what are the consequences? Texas Sea Grant. $176,603. 5/2014-4/2016. This project uses the UHCC for logistical support.

PI: Merryl Alber, Steven Pennings. LTER: Georgia Coastal Ecosystems III. National Science Foundation. $5,880,000. UH budget $292,021. 2012-2018. This project uses the UHCC for logistical support.

PI: Guoquan Wang. Title: TUES (Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics): Integrating GPS and LIDAR into

geosciences education. Sponsor: NSF. Project period: October 1, 2013—September 30, 2016. Total Award: $168,187.

PI: Guoquan Wang, co-PIs: Ramesh Shrestha, T. C. Hsu, Shuhab Khan, and Barry Lefer, “MRI: Acquisition of GPS Equipment for Establishing a Continuously Operating Dense GPS Network in Houston Metropolitan Area for Urban Natural Hazards Study” (G105029) National Science Foundation [$401,374] September 2012 – August 2015.

PI: Barry Lefer, co-PI: James Flynn, "Monitoring related to ozone formation in and particulate transport into the Houston region" (G108439) Texas Commission on Environmental Quality [$189,000] April 2014 – June 2015.

PI: Barry Lefer, “Analysis of Surface Particulate Matter and Trace Gas Data Generated during the Houston Operations of DISCOVER-AQ” (G107731) Air Quality Research Program [$109,635] April 2014 – June 2015.

PI: Barry Lefer, “Improved Analysis of VOC, NO2, SO2 and HCHO data from SOF, mobile DOAS and White cell DOAS during DISCOVER AQ” (G107840) Air Quality Research Program [$23,080] April 2014 – June 2014.

PI: Barry Lefer, “Houston Aerosol Characterization and Health Experiment (HACHE)” (G106085) Houston Endowment, Inc. [$228,759] April 2013 – May 2015.

PI: Barry Lefer, “Monitoring Related to Ozone Formation in the Houston Region” (G106624) Texas Commission on Environmental Quality [$190,000] February 2013 – April 2014.

PI: Charles Criscione, William Font. NSF DEB # 1145508 “Biodiversity in the parasitic fluke genus Alloglossidium: Evolutionary origins of changes in life cycle complexity” (not included in UH total funding).

PI: Ken Whitney, Loren Rieseberg. National Science Foundation DEB 1257965. Repeatability and genetic architecture of adaptive introgression: a long-term experimental evolution study in sunflowers (not included in UH total funding).

Pending Awards

PI: Bernhard Rappenglueck, “Signatures of anthropogenic and biogenic VOCs to the formation of speciated peroxy acyl nitrates (PANs) and Ozone”, National Science Foundation (NSF) [$530,800.00], January 01, 2016 – December 31, 2018

PI: James Flynn (100%), “Monitoring Related to Ozone Formation in and Particulate Matter Transport into the Houston Region” (G109975) Texas Commission on Environmental Quality [$280,000] April 2016 – June 2017.

PI: James Flynn (100%), “Characterization of Background PM2.5 and NOx north of the Houston Metropolitan Area” (G110066) Texas Commission on Environmental Quality [$205,380] August 2016 – August 2017.

Likely Submissions in near future

Pennings. LTER: Western Gulf of Mexico. NSF. Pre-proposal will be submitted in January 2016. Full proposal would be for ~$7,000,000.

Pennings and Wang. Laboratory Renovations for the University of Houston Coastal Center. NSF Field Station and Marine Laboratories Facilities program. Will be submitted in January 2016.

Criscione. Evolutionary genomics of precocious life cycle development in parasitic flatworms. NIH. June 2016.

(4) Expenditures. The UHCC does not have a business manager and relies on staff in the department of Biology and Biochemistry to handle our accounts. We are currently not able to recompense the department for this service. Major expenses were funding for the UHCC caretaker, who provides grounds-keeping, maintenance, security, janitorial and research services, various expenses related to maintenance of the facility, and matching or seed funding for research projects.

Category	**2014-2015 Expenditures**	**Comments**
Salary	$48,943	Most of this is the UHCC caretaker (Tim Becker)
Fringe	$1,576	
M&O	$23,683	Maintenance expenses, matching or seed funding for research projects.
Travel	$521	Matching or seed funding for research projects.
Equipment	$2,000	Matching funding for research grant
Total	$76,773	

(5) Publications and Presentations. Below we list publications from 2012-2015.

In review or in press

Aziz, A., R.R. Stewart, and S. Green, 2015, Effect of GPR antenna frequency on near-surface imaging: To be submitted to J. Measurement.

Bittebiere, K., M.Garbey, M.Smaoui, B.Clement and C.Mony, A comparative study of plastic and non-plastic plant individuals under competition: importance of clonal architecture determinants, to appear in Evolutionary Ecology.

Cuchiara G., Rappenglück B. (2015): Validating a Large-Eddy Simulation for a well-documented case in the Houston-Galveston area, Texas, Atmos. Res., submitted

Liu, W., Maung-Douglass, K., Strong, D.R., Pennings, S.C. and Zhang, Y. 2016. Geographical variation in vegetative growth and sexual reproduction of the invasive Spartina alterniflora in China. Journal of Ecology 104:173-181.

Wang, Y. L. Zhu, E. Siemann and J. Ding. Repeated damage by specialist insects suppresses the growth of a high tolerance invasive tree (22 pages, 1 Table, 2 Figures, in review, Biocontrol)

Zengel, S., C. L. Montague, S. C. Pennings, S. P. Powers, M. Steinhoff, G. Fricano, C. Schlemme, M. Zhang, J. Oehrig, Z. Nixon, S. Rouhani, J. Michel. 2016. Impacts of the Deepwater Horizon oil spill on salt marsh periwinkles (Littoraria irrorata). Environmental Science & Technology. DOI: 10.1021/acs.est.5b04371.

2015

Bock, D. G., C. Caseys, R. D. Cousens, M. Hahn, S. M. Heredia, S. Hübner, K. G. Turner, K. D. Whitney, and L. H. Rieseberg. 2015. What we still do not know about invasion genetics. Molecular Ecology 24: 2277-2297.

Guo, H., S. A. Chamberlain, E. Elhaik, I. Jalli1, A. Lynes, L. Marczak, N. Sabath, A. Vargas, K. Więski, E. M. Zelig and S. C. Pennings*. 2015. Geographic variation in plant community structure of salt marshes: species, functional and phylogenetic perspectives. PLOS ONE 10(5): e0127781. doi:10.1371/journal.pone.012778.

He, Q., M. D. Bertness, J. F. Bruno, B. Li, G. Chen, T. C. Coverdale, A. H. Altieri, J. Bai, T. Sun, S. C. Pennings, J. Liu, P. R. Ehrlich, B. Cui. 2014. Economic development and coastal ecosystem change in China. Scientific Reports 4:5995, DOI: 10.1038/srep05995.

Hübner, L., S. C. Pennings and M. Zimmer. 2015. Sex- and habitat-specific movement of an omnivorous semi-terrestrial crab controls habitat connectivity and subsidies: a multi-parameter approach. Oecologia 178:999-1015.

Whitney, K. D., K. W. Broman, N. C. Kane, S. M. Hovick, R. A. Randell, and L. H. Rieseberg. 2015. QTL mapping identifies candidate alleles involved in adaptive introgression and range expansion in a wild sunflower. Molecular Ecology 24: 2194-2211.

Yang Q., B. Li, and E. Siemann. 2015a. The effects of fertilization on plant-soil interactions and salinity tolerance of invasive Triadica sebiferum. Plant Soil 394:99-107.

Yang Q., S. Wei, L. Shang, J. Carrillo, C.A. Gabler, S. Nijjer, B. Li, E. Siemann. 2015b. Mycorrhizal associations of an invasive tree are enhanced by both genetic and environmental mechanisms. Ecography 38:1112-1118.

2014

Ahern, J. R. and K. D. Whitney. 2014. Sesquiterpene lactone stereochemistry influences herbivore resistance and plant fitness in the field. Annals of Botany 113: 731-740.

Ahern, J. R. and K. D. Whitney. 2014. Stereochemistry affects sesquiterpene lactone bioactivity against an herbivorous grasshopper. Chemoecology 24: 35-39.

Carrillo J., D. McDermott, and E. Siemann. 2014. Loss of specificity: Native but not invasive populations vary in tolerance to different herbivores. Oecologia 174: 863-871.

Chang, L., R. R. Stewart, and N. Dyaur, 2014, Geophysics for astronauts: GSH Journal, 5, 4, 26-27.

Gu X., E. Siemann,L. Zhu, S. Gao, Y. Wang, and J. Ding. 2014. Invasive plant population and herbivore identity affect latex induction. Ecological Entomology 39:1-9.

Guo, H., K. Więski, Z. Lan and S. C. Pennings. 2014. Relative influence of deterministic processes on structuring marsh plant communities varies across an abiotic gradient. Oikos 123:173-178. DOI: 10.1111/j.1600-0706.2013.00425.x.

He, Q., M. D. Bertness, J. F. Bruno, B. Li, G. Chen, T. C. Coverdale, A. H. Altieri, J. Bai, T. Sun, S. C. Pennings, J. Liu, P. R. Ehrlich, B. Cui. 2014. Economic development and coastal ecosystem change in China. Scientific Reports 4:5995, DOI: 10.1038/srep05995.

Holland, J.N. and F. Molina-Freaner. 2013. Hierarchical effects of rainfall, nurse plants, granivory, and seed banks on cactus recruitment. Journal of Vegetation Science 24: 1053-1061.

Holland, J.N., Y. Wang, S. Sun, and D.L. DeAngelis. 2013. Consumer-resource dynamics of indirect interactions in a mutualism-parasitism food web module. Theoretical Ecology 6: 475-493.

Hovick, S.M., and K. D. Whitney. 2014. Hybridization is associated with increased fecundity and size in invasive taxa: meta-analytic support for the hybridization-invasion hypothesis. Ecology Letters 17: 1464–1477.

Huang, W., E. Siemann, L. Xiao, X. Yang, and J. Ding. Species-specific defense responses facilitate conspecifics and inhibit heterospecifics in above-belowground herbivore interactions. Nature Communications 5: 4851. doi:10.1038/ncomms5851

Malek, S. and M. Garbey, Improving Volunteer Computing Scheduling for Evolutionary Algorithms, Future Generation Computer Systems, Vol 29 Issue 1:pp1-14, 2013.

Pennings, S. C., B. D. McCall and L. Hooper-Bui. 2014. Effects of oil spills on terrestrial arthropods in coastal wetlands. Bioscience64:789-795. DOI:10.1093/biosci/biu118.

Sharitz, R. R., Batzer, D. P. and S. C. Pennings. 2014. Ecology of freshwater and estuarine wetlands: an introduction. In, D. P. Batzer and R. R. Sharitz, eds.

Ecology of Freshwater and Estuarine Wetlands. Second edition. University of California Press. In press.

Sharitz, R. R. and S. C. Pennings. 2014. Development of wetland plant communities. In, D. P. Batzer and R. R. Sharitz, eds. Ecology of Freshwater and Estuarine Wetlands. Second edition. University of California Press. In press.

Silva A. and R. R. Stewart, 2014, Seismic, sonar, and sunshine: The 2014 UH Geophysics Field Camp at Galveston: GSH Journal, 5, 8.

Whitney, K. D., and E. Gering. in press. Five decades of invasion genetics. New Phytologist.

Więski, K. and S. C. Pennings. 2014. Latitudinal variation in resistance and tolerance to herbivory of a salt marsh shrub. Ecography 37:763-769. DOI:10.1111/ecog.00498.

Więski, K. and S. C. Pennings. 2014. Climate drivers of Spartina alterniflora saltmarsh production in Georgia, USA. Ecosystems 17: 473-484. DOI: 10.1007/s10021-013-9732-6.

Wilmot C.-S. M., Rappenglück B., Li X. (2014): MM5 v3.6.1 and WRF v3.2.1 model comparison of standard and surface energy variables in the development of the planetary boundary layer, Geosci. Model Dev.Discuss., 7, 2705-2743, doi: 10.5194/gmdd-7-2705-2014

Yang, Q., B. Li, and E. Siemann. 2014. Positive and negative biotic interactions and invasive Triadica sebifera tolerance to salinity: a cross-continent comparative study (In press, Oikos).

2013

Chamberlain, S. A., K. D. Whitney, and J.A. Rudgers. 2013. Proximity to agriculture alters abundance and community composition of wild sunflower mutualists and antagonists. Ecosphere 4(8): 96.

Chen L, C.Tiu, S. Peng, and E. Siemann. 2013. Phenotypic plasticity and invasion: invasive populations of Triadica sebifera have performance advantage over native populations only in low soil salinity. PLoS-one 8(9): e74961. doi:10.1371/journal.pone.0074961

Ewers, C., A. Beiersdorf, K. Wieski, S. C. Pennings, and M. Zimmer. 2012. Predator/prey-interactions promote decomposition of low-quality detritus. Wetlands 32: 931-938. DOI 10.1007/s13157-012-0326-4.

Gabler C.A. and E. Siemann. 2013. Timing of favorable conditions, competition and fertility interact to govern recruitment of invasive Chinese tallow tree in stressful environments. PLoS ONE 8(8): e71446. doi:10.1371/journal.pone.0071446

Gabler C.A. and E. Siemann. 2013. Rapid ontogenetic niche expansions in invasive Chinese tallow tree permit establishment in unfavorable but variable

environments and can be exploited to streamline restoration. Journal of Applied Ecology 50(3)748-756.

Gu X., E. Siemann,L. Zhu, S. Gao, Y. Wang, and J. Ding. 2013. Invasive plant population and herbivore identity affect latex. Ecological Entomology.

Guo, H., Y. Zhang, Z. Lan and S. C. Pennings. 2013. Biotic interactions mediate the expansion of black mangrove (Avicennia germinans) into salt marshes under climate change. Global Change Biology 19:2765-2774. DOI: 10.1111/gcb.12221.

Guo, H., K. Więski, Z. Lan and S. C. Pennings. 2013. Relative influence of deterministic processes on structuring marsh plant communities varies across an abiotic gradient. Oikos. DOI: 10.1111/j.1600-0706.2013.00425.x.

Ho, C.-K. and S. C. Pennings. 2013. Preference and performance in plant-herbivore interactions across latitude—a study in U.S. Atlantic salt marshes. PLOS One. doi: 10.1371/journal.pone.0059829.

Horn K.C., M.D. Eubanks, and E. Siemann. 2013. The effect of diet on intra- and interspecific interactions of Caribbean crazy ants (Nylanderia pubens) PLoS ONE 8(6): e66912. doi:10.1371/journal.pone.0066912

Marczak, L. B., K. Więski, R. F. Denno and S. C. Pennings. 2013. Importance of local versus geographical variation in saltmarsh plant quality for arthropod herbivore communities. Journal of Ecology 101:1169-1182.

Pennings, S. C. 2013. Forging collaborations between ecology and historical ecology. In V. D. Thompson and J. C. Waggoner Jr. (eds.), The archaeology and historical ecology of small scale economies. The University Press of Florida, Gainesville.

Schalles, J. F., C. M. Hladik, A. A. Lynes and S. C. Pennings. 2013. Landscape estimates of habitat types, plant biomass, and invertebrate densities in a Georgia salt marsh. Oceanography 26:88-97.

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(6) Outreach and Service. In 2014-2015, the UHCC hosted visits by the Texas Master Naturalists who collected seed and prairie plants for restoration projects. The company Native American Seed is marketing prairie plant seed from the UHCC for sale to individuals and organizations interested in prairie restoration projects.

Chelse Prather gave a seminar at the Southern Prairie and Plains Conference about her work at UHCC to a group of landowners, scientists, restorationists, and conservationists from grasslands regionally (about 40 people at seminar), gave a tour of her NSF-funded field experiment to a seed-collecting group (about 15 people) from the Coastal Prairie Partnership, created a Wikipedia site for a common grasshopper species at UHCC and across North America.

On March 5, 2015, the Science Teaching Equity Project (Dominey, PI) demonstrated the ScalingUpMarshScience.cs.uh.edu website to 15, grades 4-6 teachers and subsequently shared the website by email with an additional 40, grades 4-6 teachers. The purpose was to gather feedback on using the website and to create an interest in participating in future research and outreach activities related to UHCC.

Each year Flynn and Lefer participate in the Sam Houston Area Council's Scout Fair, one of the largest in the country. Each year approximately 22,000 Scouts and family members attend from 16 counties to earn advancements and demonstrate the skills they have learned. Our group brings our mobile lab and weather tower to the event to demonstrate weather balloon launches and showcase the measurement work we do around the Houston area, including the UH Coastal Center.

(7) Courses taught at the UHCC.

UH

BIOL 2397, Introduction to Field Biology, Ann Cheek. Hands on field education. Three hours per day, M – F, for the 5-week June 2015 summer school session. 6 students.

BIOL 4206, Ecology and Evolution Laboratory. Larry Williams. Field trips to UHCC.

GEOL4300 Introduction to Geophysics, Guoquan Wang. ~120 students.

GEOL4332 Geoscience Applications of GPS and LIDAR, Guoquan Wang. ~60 students.

GEOL 4355, UH Geophysics Field Camp, Rob Stewart, Guoquan Wang. Six-day camp using the two wells at UHCC, roads for seismic and GPR surveys, GPS for elevation studies, and classroom facilities. 64 students.

GEOL6324 Satellite Positioning and GPS Geodesy. Guoquan Wang. ~25 students.

Nautilus World LLC, Seismic Acquisition: Principles and Practice. Rob Stewart. Five-day industry course on seismic acquisition techniques using the wells, roads, and classroom facilities at UHCC, 11 students.

ARCH5500, Architecture Design Studio, Patrick Peters. Using the UHCC as the subject of their semester-long academic assignment, twelve UH undergraduate architecture students conducted research and designed master plans and building proposals for the UH Coastal Center as a form of service learning. 12 students.

UHD

BIOL-CHEM-GEOL 4260 Environmental Lab and Field Studies, Michael Tobin. Two four-hour field exercises at the UHCC, ~12 students.

(8) User days. We recorded 1,134 visitor-days to the UHCC In 2012, 1,633 in 2013, 1,677 in 2014, and 1,790 (as of November) in 2015, indicating a steady increase in use over the last 3 years. Visits to the UHCC are split between research (~25%), education (~25%) and operation of the oil wells (~50%), with a small number of outreach days. About 19% of the user days are faculty and staff, 6% graduate students, 25% undergraduates, and 50% industry.

J. Future Measures of Performance

Administration of the UHCC was transferred from the Division of Research to the Dean of NSM in the fall of 2014. Pennings and Wang are working with the Dean to discuss how the UHCC will be administered and funded in future years, and to develop a new strategic plan. Our general goals will remain unchanged: to continue to increase research, teaching and service activities that are facilitated by UHCC.