CURRICULUM VITAE

H. CARLTON (CARL) FITZ, III

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EDUCATION

1990: Ph.D., Ecology. University of Georgia, Athens, GA, USA.

1979: B.A. with Distinction, Environmental Science. University of Virginia, Charlottesville, VA, USA.

PROFESSIONAL EXPERIENCE

2017 - present: Courtesy Assistant Professor, School of Geosciences, University of South Florida.

2017 - present: Courtesy Research Associate, Southeast Environmental Research Center; Consultant, Institute of Environment, Florida International University.

2014 - present: CEO, EcoLandMod, Inc. Research and applications in landscape ecology and modeling.

2007 - 2014: Assistant Professor, Soil and Water Science Department, Ft. Lauderdale Research and Education Center, IFAS, University of Florida. Research (55%) and Extension (45%) appointment in landscape ecology and modeling.

2001 - 2007: Lead Environmental Scientist: Everglades Division; Hydrologic & Environmental Systems Modeling Department, South Florida Water Management District. Leader in development and application of spatially explicit simulation models (primarily the Everglades Landscape Model) for integrated ecological assessment of the Everglades.

1996 - 2001: Senior Environmental Scientist, Everglades Systems Research Division, South Florida Water Management District. Principal developer and analyst of the spatially explicit Everglades Landscape Model for integrated ecological assessment of the Everglades.

1993 - 1996: Assistant Research Scientist, Institute for Ecological Economics, Center for Environmental and Estuarine Studies, University of Maryland. Team leader in development of spatially explicit simulation models (incl. Everglades Landscape Model) for regional scale ecological research and management.

1991 - 1993: Postdoctoral Research Associate, Chesapeake Biological Laboratory, Center for Environmental and Estuarine Studies, University of Maryland. Developed spatially explicit simulation model for regional scale ecological research and management.

1989: Consultant, University of Georgia Marine Institute. Developed interactive FORTRAN computer programs for data management/summary of remotely recorded data.

1988: Graduate Research Assistant, University of Georgia. Responsible for research project which investigated recruitment patterns of postlarval brachyuran crabs.

1987 - 1988: Graduate Teaching Assistant, University of Georgia. Taught introductory biology laboratory course.

1984 - 1987: Graduate Research Assistant, University of Georgia. Responsible for research program on blue crabs (*Callinectes sapidus*) within a model-based, ecosystem-level perspective. Hired and supervised one technician.

1982 - 1984: Graduate Research Assistant (non-teaching), University of Georgia.

1982: Consultant, Eastern Caribbean Natural Area Management Program. Assisted in surveying coral reef, seagrass and mangrove habitats for a prospective National Marine Park in the British Virgin Islands.

1980 - 1982: Environmental Research Technician I, Division of Natural Resources Management, Department of Conservation and Cultural Affairs, U.S. Virgin Islands Government. Assisted in multi-disciplinary monitoring and basic research projects in coral reef, seagrass, and mangrove systems.

PUBLICATIONS

Refereed

Guaita-Garcia, Noelia, Julia Martínez-Fernández, and Carl Fitz. 2020. Environmental scenario analysis on natural and social-ecological systems: A review of methods, approaches and applications. Sustainability 12:7542. doi: 10.3390/su12187542

Guaita-Garcia, Noelia, Julia Martínez-Fernández, Carlos Javier Barrera-Causil, Miguel Ángel Esteve-Selma, and H. Carl Fitz. 2020. Local perceptions regarding a social-ecological system of the Mediterranean coast: The Mar Menor (Región de Murcia, Spain). Environment, Development and Sustainability. doi: 10.1007/s10668-020-00697-y

Orem, W., C. Fitz, D. Krabbenhoft, B. Poulin, M. Varonka, and G. Aiken. 2020. Ecosystem-scale modeling and field observations of sulfate and methylmercury distributions in the Florida Everglades: Responses to reductions in sulfate Loading. Aquatic Geochemistry. doi: 10.1007/s10498-020-09368-w

Flower, H., M. Rains, C. Fitz, W. Orem, S. Newman, T. Osborne, K. Reddy, and J. Obeysekera. 2019. Shifting ground: Landscape-scale modeling of biogeochemical processes under climate change in the Florida Everglades. Environmental Management 64:416-435. doi: 10.1007/s00267-019-01200-8

Flower, H.D., M.C. Rains, and H.C. Fitz. 2017. Visioning the future: scenarios modeling of the Florida Coastal Everglades. Environmental Management 60:989-1009. doi: 10.1007/s00267-017-0916-2

Osborne, T. Z., H. C. Fitz, and S. E. Davis. 2017. Restoring the foundation of the Everglades ecosystem: assessment of edaphic responses to hydrologic restoration scenarios. Restoration Ecology 25, No. S1, pp. S59–S70. doi: 10.1111/rec.12496

Walters, T., F.J. Mazzotti, and H.C. Fitz. 2016. Habitat selection by the invasive species Burmese Python in southern Florida. Journal of Herpetology 50: 50-56.

Orem, W., H. C. Fitz, D. Krabbenhoft, M. Tate, C. Gilmour, and M. Shafer. 2014. Modeling sulfate transport and distribution and methylmercury production associated with Aquifer Storage and Recovery implementation in the Everglades Protection Area. Sustainability of Water Quality and Ecology 3-4:33-46. doi:10.1016/j.swaqe.2014.11.004.

Martínez Fernández, J., C. Fitz, M.A. Esteve Selma, N. Guaita, J. Martínez-López. 2013. [Spanish language article]. Modelling the effects of land use change on the nutrient dynamics in a coastal agricultural watershed: the Mar Menor case (Southeastern Spain). Ecosistemas 22(3):84-94. Doi:10.7818/ECOS.2013.22-3.12.

Troxler, T.G., E. Gaiser, J. Barr, J.D. Fuentes, R. Jaffé, D.L. Childers, L. Collado-Vides, V.H. Rivera-Monroy, E. Castañeda-Moya, W. Anderson, R. Chambers, M. Chen, C. Coronado-Molina, S.E. Davis, V. Engel, C. Fitz, J. Fourqurean, T. Frankovich, J. Kominoski, C. Madden, S.L. Malone, S.F. Oberbauer, P. Olivas, J. Richards, C. Saunders, J. Schedlbauer, L.J. Scinto, F. Sklar, T. Smith, J.M. Smoak, G. Starr, R.R. Twilley, and K.R.T. Whelan. 2013. Integrated carbon budget models for the Everglades terrestrial-coastal-oceanic gradient: Current status and needs for inter-site comparisons. Oceanography 26 (3): 98-107. Doi: 10.5670/oceanog.2013.51.

Esteve, M.Á., H.C. Fitz, N. Guaita, C.T. López, P. Martín de Agar, J. Martínez Fernández, M.J. Roldán, and J.L. Tellería. 2011. [Spanish language article]. Cambios de ocupación del suelo en la cuenca del Segura y sus implicaciones para la biodiversidad [Land cover changes in the Segura basin and its implications for biodiversity]. In: Jiménez Herrero, L.M. (Ed.), Biodiversidad en España. Base de la Sostenibilidad ante el Cambio Global [Biodiversity in Spain: Base of Sustainability under Global Change]. Observatorio de la Sostenibilidad en España [Spanish Observatory for Sustainability], Madrid, España, pp. 120-174.

Reddy, K.R., S. Newman, T.Z. Osborne, J.R. White, and H.C. Fitz. 2011. Legacy phosphorus in the Greater Everglades Ecosystem: implications for management and restoration. Critical Reviews in Environmental Science and Technology 41: 149-186.

Fitz, H. C., G. A. Kiker, and J. B. Kim. 2011. Integrated ecological modeling and decision analysis within the Everglades landscape. Critical Reviews in Environmental Science and Technology 41: 517-547. DOI: 10.1080/10643389.2010.530572.

Fitz, H.C. 2008. Ecological models: Wetlands. In: S.V. Jorgensen and B.D. Fath (Eds.), Encyclopedia of Ecology Vol. 5. Elsevier, Oxford, UK. pp. 3780-3790.

Voinov, A., R. Costanza, C. Fitz, and T. Maxwell. 2007. Patuxent landscape model: 1. Hydrological model development. Water Resources 34:163-170.

Voinov, A., R. Costanza, C. Fitz, and T. Maxwell. 2007. Patuxent landscape model: 2. Model development — nutrients, plants, and detritus. Water Resources 34:268-276.

Fitz, H.C., and B. Trimble. 2006. Documentation of the Everglades Landscape Model: ELM v2.5. South Florida Water Management District. http://www.ecolandmod.com/publications. (Reviewed by independent expert panel, review report at http://www.ecolandmod.com/publications) 664 pages.

Voinov, A., C. Fitz, R. Boumans, R. Costanza. 2004. Modular ecosystem modeling. Environmental Modelling & Software 19: 285-304.

Fitz, H.C., F.H. Sklar, A.A. Voinov, T. Waring, R. Costanza, and T. Maxwell. 2004. Development and application of the Everglades Landscape Model. *In*: R. Costanza and A.A. Voinov (Eds.), Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach. Springer-Verlag, New York, NY. pp. 143-171.

Villa, F., A.A.Voinov, H.C. Fitz, and R. Costanza. 2004. Calibration of large spatial models: a multi-stage, multi-objective optimization technique. *In*: R. Costanza and A.A. Voinov (Eds.), Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach. Springer-Verlag, New York, NY. pp. 77-116.

Voinov, A.A., H.C. Fitz, R.M.J. Boumans, and R. Costanza. 2004. Modular Ecosystem Modeling. *In*: R. Costanza and A.A. Voinov (Eds.), Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach. Springer-Verlag, New York, NY. pp. 43-76.

Voinov, A., C. Fitz, T. Maxwell, R. Boumans, R. Costanza. 2002. Modular Ecosystem Modelling. *In*: A. Jakeman, A. Rizzoli (Eds.), Integrated Assessment and Decision Support. Proceedings of IEMSS 2002 Conference, 24-27 June 2002, Lugano, Switzerland. pp. 263-268.

Sklar, F.H., H.C. Fitz, Y. Wu, R. Van Zee, and C. McVoy. 2001. The design of ecological landscape models for Everglades restoration. Ecological Economics 37: 379-401.

Sklar, F.H., C. McVoy, M. Darwish, S. Davis, C. Fitz, D. Gawlik, S. Miao, M. Korvela, C. Madden, I. Mendelssohn, S. Newman, J. Ogden, J. Otero, R. Shuford, and S. Smith. 2001. Hydrologic needs: The effects of altered hydrology on the Everglades. *In:* G. Redfield (Ed.), Everglades Consolidated Report. South Florida Water Management District, West Palm Beach, FL, pp. 2-1 – 2-68.

Fitz, H.C., and F.H. Sklar. 1999. Ecosystem analysis of phosphorus impacts and altered hydrology in the Everglades: a landscape modeling approach. *In:* K. R. Reddy, G. A. O'Connor, and C. L. Schelske (Eds.), Phosphorus Biogeochemistry in Subtropical Ecosystems. Lewis Publishers, Boca Raton, FL. pp. 585-620.

McCormick, P., S. Newman, S. Miao, R. Reddy, D. Gawlik, C. Fitz, T. Fontaine, and D. Marley. 1999. Ecological needs of the Everglades. *In:* G. Redfield (Ed.), Everglades Interim Report. South Florida Water Management District, West Palm Beach, FL, pp. 3-1 – 3-66.

Sklar, F.H., C. McVoy, R. Van Zee, D. Gawlik, D. Swift, W. Park, C. Fitz, Y. Wu, D. Rudnick, T. Fontaine, S. Miao, A. Ferriter, S. Krupa, T. Armentano, K. Tarboton, K. Rutchey, Q. Dong, and S. Newman. 1999. Hydrologic needs: The effects of altered hydrology on the Everglades. *In:* G. Redfield (Ed.), Everglades Interim Report. South Florida Water Management District, West Palm Beach, FL, pp. 2-1 – 2-70.

Wu, J., H. Huang, H.C. Fitz, Y. Wu, and F.H. Sklar. 1998. A new domain partition scheme for the Everglades Landscape Model. International Journal of Computers and Applications, 20:137-146.

Voinov, A. A., H.C. Fitz, and R. Costanza. 1998. Surface water flow in landscape models: 1. Everglades case study. Ecological Modelling. 108: 131-144.

Voinov, A., C. Fitz, and R. Costanza. 1997. Landscape model provides Everglades management tool. GIS World 10:48-51.

Fitz, H.C., E.B. DeBellevue, R. Costanza, R. Boumans, T. Maxwell, L. Wainger, and F.H. Sklar. 1996. Development of a general ecosystem model for a range of scales and ecosystems. Ecological Modelling 88: 263-295.

Fitz, H.C., and R.G. Wiegert. 1992. Local population dynamics of estuarine blue crabs: abundance, recruitment and loss. Marine Ecology Progress Series 87:23-40.

Fitz, H.C., and R.G. Wiegert. 1991. Utilization of the intertidal zone of a salt marsh by the blue crab, *Callinectes sapidus*: density, return frequency, and feeding habits. Marine Ecology Progress Series 76:249-260.

Fitz, H.C., and R.G. Wiegert. 1991. Tagging juvenile blue crabs, *Callinectes sapidus*, with microwire tags: retention, survival and growth through multiple molts. Journal of Crustacean Biology 11:229-235.

Fitz, H.C. 1990. The utilization of a salt marsh estuary by the blue crab, *Callinectes sapidus*. Dissertation. University of Georgia, Athens, Georgia. 191 pages.

Rogers, C.S., H.C. Fitz, M. Gilnack, J. Beets, and J. Hardin. 1984. Scleractinian coral recruitment patterns at Salt River submarine canyon, St. Croix, U.S. Virgin Islands. Coral Reefs 3:69-86.

Fitz, H.C., M.L. Reaka, E. Bermingham, and N.G. Wolf. 1983. Coral recruitment at moderate depths: the influence of grazing. *In:* M.L. Reaka (Ed.), The Ecology of Deep and Shallow Coral Reefs. Symposia Series for Undersea Research, Volume 1. NOAA Undersea Research Program, Rockville, Maryland, USA. pp. 89-96.

Rogers, C.S., M. Gilnack, and H.C. Fitz. 1983. Monitoring of coral reefs with linear transects: a study of storm damage. Journal of Experimental Marine Biology and Ecology 66:285-300.

University of Florida Extension Publications

Peer-reviewed extension publications are stored in the Web-based, Electronic Data Information System (EDIS) repository.

Fitz, H.C. 2010. South Florida Conceptual Model. Document SL320, Soil and Water Science Department, IFAS, UF. http://edis.ifas.ufl.edu/ss532. 7 pp.

Fitz, H.C. 2010. Ecological Landscape Modeling: the general application of an existing simulation framework. Document SL321, Soil and Water Science Department, IFAS, UF. http://edis.ifas.ufl.edu/ss533. 8 pp.

Fitz, H.C., and N. Hughes. 2008. Wetland Ecological Models. Document SL257, Soil and Water Science Department, IFAS, UF. http://edis.ifas.ufl.edu/ss481. 4 pp.

Technical Reports

Fitz, H. C. 2021. Refinements to the Everglades Landscape Model: ELM v3.2.1. LTER: Coastal Oligotrophic Ecosystem Research - Integrated Modeling, Year 1 Final Report. EcoLandMod, Inc. Fort Pierce, FL. http://www.ecolandmod.com/publications. 298 pp.

Fitz, H. C. 2015. Documentation of the Everglades Landscape Model: ELM v2.9.0 - Wading Bird Suitability. EcoLandMod, Inc. Fort Pierce, FL. http://www.ecolandmod.com/publications. 133 pp.

Fitz, H. C. 2014. FCE Climate Change and Sea Level Rise: Summary of Our Preliminary Scenario Analyses. EcoLandMod, Inc. http://www.ecolandmod.com/projects/ELM_FCE

SERES team (20 authors). 2014. An analysis of five options for restoring the Everglades ecosystem. Everglades Foundation report to the Critical Ecosystem Studies Initiative, National Park Service, U.S. Dept. of the Interior. 28 pages with additional technical appendices.

Fitz, H.C., 2013. Everglades landscape sulfate dynamics: Final summary evaluation of CERP ASR Alternatives. Ft. Lauderdale Research and Education Center, University of Florida. http://www.ecolandmod.com/projects/ELMreg500mASR. 13 pp. with links to web pages with technical detail.

Fitz, H.C., 2013. Documentation of the Everglades Landscape Model: ELM v2.8.6 - Sulfate module: Ft. Lauderdale Research and Education Center, University of Florida. http://www.ecolandmod.com/publications/. 128 pp.

Arik, A., Beerens, J., Borkhataria, R., Childers, D.L., III, S.E.D., Davis, S.M., Engel, V., Fitz, C., Gaiser, E.E., Harvey, J.W., Lodge, T.E., Marshall, F., McCormick, B., Naja, G.M., Osborne, T.Z., Ross, M.S., Trexler, J.C., Lent, T.V., Wetzel, P.R., and Xu, H. 2012. A draft analysis of two hydrologic restoration options for the Everglades: Existing Conditions Base (ECB) & CERP. Everglades Foundation report to the Critical Ecosystems Studies Initiative, National Park Service, U.S. Dept. of the Interior. 18 pages with additional technical appendices.

CERP Decomp Water Quality Team[1]. 2012. Water Conservation Area 3 Decompartmentalization Project Implementation Report 1 - Everglades Landscape Model Evaluation of Water Quality Risk. United States Army Corps of Engineers, Jacksonville District, and South Florida Water Management District, West Palm Beach, FL, and Jacksonville, FL, 52 pp.

Fitz, H.C., and R. Paudel. 2012. Documentation of the Everglades Landscape Model: ELM v2.8.4. Ft. Lauderdale Research and Education Center, University of Florida. http://www.ecolandmod.com/publications. 364 pp.

Esteve, M.Á., Fitz, H.C., Guaita, N., López, C.T., Martín de Agar, P., Martínez Fernández, J., Roldán, M.J., Tellería, J.L. 2011. Cambios de ocupación del suelo en la cuenca del Segura y sus implicaciones para la biodiversidad (Land cover changes in the Segura basin and its implications for biodiversity). In: Checa Rodríguez, A. (Ed.), Biodiversidad en España: Una Visión desde la Sostenibilidad Ante el Cambio Global (Biodiversity in Spain: A View of Sustainability to Global Change). Observatorio de la Sostenibilidad en España (Spanish Observatory for Sustainability), Madrid, España, pp. 118-172.

Fitz, H.C. 2009. Documentation of the Everglades Landscape Model: ELM v2.8. Ft. Lauderdale Research and Education Center, University of Florida. (Final report submitted to Joint Ecosystem Modeling, USGS Priority Ecosystem Science Program). http://www.ecolandmod.com/publications. 214 pp.

[1] Convention was that team documents did not list individual members; C. Fitz had major (but not primary) role in developing report.

Fitz, H.C. 2008. Documentation of the Everglades Landscape Model: Application of ELMwca1 v2.8. Final report submitted to South Florida Water Management District, Everglades Division. West Palm Beach, FL. http://www.ecolandmod.com/publications. 236 pp.

Fitz, H.C. 2007. ELM support of ecological models for Everglades restoration: Task 1.1, Reconcile data - topography. Report to USGS, Greater Everglades Priority Ecosystem Science Program. Ft. Lauderdale Research and Education Center, University of Florida. September 2007. 11 pp.

Fitz, H.C. 2007. ELM support of ecological models for Everglades restoration: Task 2.1, Course outline. Report to USGS, Greater Everglades Priority Ecosystem Science. Ft. Lauderdale Research and Education Center, University of Florida. October 2007. 5 pp.

Fitz, H.C. 2007. ELM support of ecological models for Everglades restoration: Task 3.1, ELM v2.7alpha. Report to USGS, Greater Everglades Priority Ecosystem Science Program. Ft. Lauderdale Research and Education Center, University of Florida. September 2007. 18 pp.

Fitz, H.C. 2007. ELM support of ecological models for Everglades restoration: Task 3.2, ELM v2.8.0. Report to USGS, Greater Everglades Priority Ecosystem Science. Ft. Lauderdale Research and Education Center, University of Florida. December 2007. 19 pp.

Fitz, H.C. 2007. Ecological Landscape Modeling: the general application of an existing simulation framework. White paper prepared for the Environmental Laboratory, US Army Engineer Research and Development Center, Vicksburg, MS, USA. 14 pp.

Everglades Landscape Model Developers. 2002. Calibration performance of ELM v2.1a: 1979-1995 water quality and hydrology. South Florida Water Management District. 209 pp.

Fitz, H.C., N. Wang, J. Godin, F.H. Sklar, B. Trimble, K. Rutchey. 2002. Agency/public review of ELM v2.1a: ELM developers' response to reviews. South Florida Water Management District. 91 pp.

Fitz, H.C., A. A. Voinov, and R. E. Ulanowicz. 1996. Modeling water column attributes for ATLSS: WatAtt implementation. Report to National Biological Survey, South Florida/Caribbean Research Center, Homestead, FL 33030-0279.

Costanza, R., H. C. Fitz, T. Maxwell, A. Voinov, H. Voinov, and L. A. Wainger. 1995. Patuxent Landscape Model: Sensitivity Analysis and Nutrient Management Scenarios. Interim Report for U.S. EPA Cooperative Agreement: #CR 821925010. Center for Environmental and Estuarine Studies, University of Maryland, Solomons, MD.

Fitz, H.C., A. Voinov, and R. Costanza. 1995. The Everglades Landscape Model: Final Report. Report to the South Florida Water Management District, Everglades Research Division.

Fitz, H.C., A. Voinov, and R. Costanza. 1995. The Everglades Landscape Model: Scenario Testing Report. Report to the South Florida Water Management District, Everglades Research Division. 15 pages.

Fitz, H.C., A. Voinov, and R. Costanza. 1995. The Everglades Landscape Model: Verification Analysis Report. Report to the South Florida Water Management District, Everglades Research Division. 16 pages.

Fitz, H.C., A. Voinov, and R. Costanza. 1995. The Everglades Landscape Model: Calibration Analysis Report. Report to the South Florida Water Management District, Everglades Research Division. 13 pages and binary files.

Fitz, H.C., A. Voinov, and R. Costanza. 1995. The Everglades Landscape Model: Multiscale Sensitivity Analysis. Report to the South Florida Water Management District, Everglades Research Division. 88 pages.

Fitz, H.C., R. Costanza, and E. Reyes. 1994. The Everglades Landscape Model (ELM): Compilation of Verification Data. Report to the South Florida Water Management District, Everglades Research Division. 2 pages and 57 Mb binary files.

Fitz, H.C., R. Costanza, and E. Reyes. 1994. The Everglades Landscape Model (ELM): Compilation of Calibration Data. Report to the South Florida Water Management District, Everglades Research Division. 7 pages and 48 Mb binary files.

Fitz, H.C., R. Costanza, and E. Reyes. 1993. The Everglades Landscape Model (ELM): Summary Report of Task 2, Model Development. Report to the South Florida Water Management District, Everglades Research Division. 109 pages.

Costanza, R., H.C. Fitz, T. Maxwell, and E. Reyes. 1993. The Everglades Landscape Model (ELM): Canal Routing Considerations. Report to the South Florida Water Management District, Everglades Research Division. 9 pages.

Costanza, R., H.C. Fitz, T. Maxwell, and E. Reyes. 1993. The Everglades Landscape Model (ELM): Scaling Considerations. Report to the South Florida Water Management District, Everglades Research Division. 18 pages.

Costanza, R., H.C. Fitz, E. DeBellevue, and E. Reyes. 1993. The Everglades Landscape Model: The Unit Model, GEM v.1.0. Report to the South Florida Water Management District, Everglades Research Division. 6 pages.

Costanza, R., H.C. Fitz, J.A. Bartholomew, and E. DeBellevue. 1992. The Everglades Landscape Model (ELM): Summary Report of Task 1, Model Feasibility Assessment. Report to the South Florida Water Management District, Everglades Research Division. 118 pages.

Costanza, R., H.C. Fitz, J.A. Bartholomew, and E. DeBellevue. 1992. The Everglades Landscape Model (ELM): Summary of Workshop II. Report to the South Florida Water Management District, Everglades Research Division. 22 pages.

Costanza, R., H.C. Fitz, J.A. Bartholomew, and E. DeBellevue. 1992. The Everglades Landscape Model (ELM): Summary of Workshop I. Report to the South Florida Water Management District, Everglades Research Division. 13 pages.

Rogers, C.S., H.C. Fitz, and M. Gilnack. 1982. Coral reefs, mangroves and seagrass beds of northern Virgin Gorda, British Virgin Islands. A report submitted to the Eastern Caribbean Natural Area Management Program and the British Virgin Islands Government.

SYMPOSIA ORGANIZED FOR PROFESSIONAL MEETINGS

DeAngelis, D.L., and H.C. Fitz. "Ecological Modeling". April 2003. Session at the 2003 Greater Everglades Ecosystem Restoration Science Conference. Palm Harbor, FL.

Fitz, H.C. "Watershed Modeling". April 2000. Special Session at the 15th Annual Symposium of the International Association for Landscape Ecology. Fort Lauderdale, FL.

PRESENTATIONS

Invited

Fitz, C., R. Paudel, Y. Khare, and T. Van Lent. April 2021. Landscape Soil Carbon Sequestration Under Scenarios of Climate Change and CERP. 2021 Greater Everglades Ecosystem Restoration Science Conference. Virtual Conference via Zoom.

Fitz, C., M. Rains, H. Flower, and E. Gaiser. April 2019. Tortoise or hare? Landscape hydro-ecological interactions from presses (sea level rise) and pulses (freshwater flows) in the coastal Everglades. 2019 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Flower, H., M. Rains, C. Fitz, W. Orem, S. Newman, T. Osborne, K. Reddy, and J. Obeysekera. April 2019. Shifting ground: Landscape-scale modeling of soil biogeochemistry under climate change in the Florida Everglades. 2019 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Fitz, H.C., H.D. Flower, and M.C. Rains. April 2017. Integrated landscape trends of hydrology, nutrients, soils, and vegetation under future management scenarios. 2017 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Fitz, H.C., T.Z. Osborne, and S.E. Davis, III. April 2015. Soil oxidation and phosphorus storage changes resulting from a range of restoration options. 2015 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Krabbenhoft, D. and 14 others. April 2015. Mercury contamination of the Everglades: revelations from the long-term ACME project and future considerations. 2015 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Varonka, M., D. Krabbenhoft, G. Aiken, C. Fitz, M. Schaefer, and W. Orem. April 2015. Sulfur and mercury modeling in the Everglades. 2015 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Van Lent, T. and 19 others. April 2015. Restoration directions: science informing the process. 2015 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Fitz. H.C. January 2015. Integrated Ecological Landscape Modeling for Everglades future scenario assessments. Everglades Systems Assessment Section, South Florida Water Management District. West Palm Beach, FL.

Fitz, H.C. June 2013. Linking water quality and hydrologic models to help inform the decision process. United Nations Educational, Scientific and Cultural Organization, Institute for Hydrology Education: Lecture Series. Davie, FL.

Fitz, H.C. Sept. 2011. Everglades management and research applications of an integrated landscape model. South Florida Natural Resource Center, Everglades National Park. Homestead, FL.

Fitz, H.C. Sept. 2011. Modeling coastal Everglades ecology under current and future sea level forcings. 11th Annual Soil and Water Science Department Research Forum, University of Florida. Gainesville, FL.

Fitz. H.C. Sept. 2011. Applications of an integrated ecological landscape model. Meeting of the National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress. Web-based meeting/presentation.

Fitz, H.C. June 2011. Everglades Landscape Model: Initial Results for DECOMP PIR 1 Phase 1 Base Runs. CERP Decompartmentalization Project Delivery Team meeting. Fort Lauderdale, FL.

Fitz. H.C. June 2011. Linking water quality and hydrologic models to help inform the decision process. United Nations Educational, Scientific and Cultural Organization, Institute for Hydrology Education: Lecture Series. Davie, FL.

Fitz. H.C. August 2010. Applications of ecological landscape models towards Everglades restoration. Interagency Modeling Center Monthly Seminar Series, South Florida Water Management District. West Palm Beach, FL.

Fitz. H.C. June 2010. Integrating water quality and hydrology to help inform the decision process. United Nations Educational, Scientific and Cultural Organization, Institute for Hydrology Education: Lecture Series. Davie, FL.

Fitz. H.C., S. Newman, S. Hagerthey, K. Rutchey, M. Cook, and F.H. Sklar. Sept. 2009. Research for Extension application: Modeling tradeoffs between hydrology and water quality in Everglades restoration planning. 10th Annual Soil and Water Science Department Research Forum, University of Florida. Gainesville, FL.

Fitz. H.C. June 2009. Integrated ecological landscape modeling. Sixteenth Meeting of the National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress. Key Largo, FL.

Fitz, H.C. October 2008. ELM support of ecological models for Everglades restoration. Joint Ecosystem Modeling Meeting, Ft. Lauderdale, FL.

Fitz, H.C. September 2008. Integrated ecological landscape modeling. 9th Annual Soil and Water Science Department Research Forum, University of Florida. Gainesville, FL.

Fitz, H.C., and G. A. Kiker. July 2008. Integrated ecological modeling and decision analysis within the Everglades landscape. Greater Everglades Ecosystem Restoration Science Conference. Naples, FL.

Fitz, H.C. March 2008. Integrated assessment in wetlands: the Everglades. Seminar Series, Tropical Research and Education Center, University of Florida. Homestead, FL.

Fitz, H.C. February 2008. Integrated assessment in wetlands: the Everglades. Water, Wetlands and Watersheds Seminar Series, H.T. Odum Center for Wetlands, University of Florida. Gainesville, FL.

Fitz, H.C. October 2007. Integrated modeling of the Florida Everglades ecosystem. Center for Louisiana Water Studies, University of Louisiana – Lafayette and the National Wetlands Center, Lafayette, LA.

Fitz, H.C. October 2007. Downstream effects of nutrients lost from upstream. UF/IFAS Certified Crop Advisor Seminar and CEU Session. Citrus Research and Education Center, Lake Alfred, FL.

Fitz, H.C. April 2007. Integrated assessment in wetlands: the Everglades. U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS.

Fitz, H.C., J. Godin, F. Sklar, B. Trimble, and N. Wang. April 2003. Everglades Landscape Model: Advances in integrated ecological assessment. Greater Everglades Ecosystem Restoration Science Conference. Palm Harbor, FL.

Fitz, H.C., C. Cornwell, T. Waring, M. Darwish, and F.H. Sklar. April 2000. A landscape simulation tool for evaluating ecological responses to altered water and nutrient management in the Everglades region. The 15th Annual Symposium of the International Association for Landscape Ecology. Fort Lauderdale, FL.

Fitz, H.C., and F.H. Sklar. February 2000. Evaluating Florida Everglades restoration using a process-based landscape simulation model. National Academy of Sciences, Committee on Restoration of the Greater Everglades Ecosystem. River Ranch, FL.

Fitz, H.C., and F.H. Sklar. September 1999. Evaluating Florida Everglades restoration using a process-based landscape simulation model. The 15th Biennial International Conference of the Estuarine Research Federation. New Orleans, LA.

DeAngelis, D.L., and H.C. Fitz. May 1999. Landscape synthesis and ecological modeling: How can we best describe, understand, and predict ecological changes at the landscape levels? South Florida Restoration Science Forum, Boca Raton, FL.

Fitz, H.C., F.H. Sklar, Y. Wu, A.A. Voinov, T. Maxwell, R. Costanza, and M. Evett. May 1999. Landscape synthesis and ecological modeling: How can the ecological responses to different management alternatives be predicted? South Florida Restoration Science Forum, Boca Raton, FL.

Fitz, H.C., F.H. Sklar, Y. Wu, A.A. Voinov, T. Maxwell, R. Costanza. March 1999. Evaluating Florida Everglades restoration using a process-based landscape simulation model. The 95th Association of American Geographers Annual Meeting. Honolulu, HA.

Fitz, H.C., R. Costanza, and A.A. Voinov. 1995. A dynamic spatial model as a tool for integrated assessment of the Everglades, USA. SCOPE/UNEP Project on Integrated, Adaptive Ecological Economic Modeling and Assessment. Pantanal region, Brazil.

Fitz, H.C. May 1993. Development of dynamic spatial simulation models. First IGBP/LOICZ (Land-Ocean Interactions in the Coastal Zone) Core Project Meeting. Raleigh, North Carolina.

Fitz, H.C. November 1992. Spatial models in estuarine research. NOAA Estuarine Habitat Program Workshop. Gloucester Point, Virginia.

Fitz, H.C., and R.G. Wiegert. May 1987. Population dynamics of the blue crab, *Callinectes sapidus*, in a Georgia salt marsh as determined by microwire tagging techniques. Portunid Ecology Workshop. Smithsonian Environmental Research Center, Edgewater, Maryland.

Contributed

Mazzei, V., C. Fitz, and E. Gaiser. April 2019. Community-level modeling of periphytic diatoms in response to changing salinity and phosphorus gradients using the Everglades Landscape Model 2019 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Flower, H., M. Rains, C. Fitz, W. Orem, S. Newman, T. Osborne, K. Reddy, and J. Obeysekera. Gaiser, E., M. Naja, D. Childers, and C. Fitz. April 2017. Water quality implications of hydrologic restoration alternatives in the Florida Everglades, USA: A periphyton perspective. 2017 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Orem, W, C. Fitz, D. Krabbenhoft, and G. Aiken. April 2017. Ecosystem-wide modeling of methylmercury distributions in the Everglades: Responses to reductions in sulfate loading. 2017 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Flower, H.D., M.C. Rains, and H.C. Fitz. April 2017 (poster). Can the Everglades survive climate change? Envisioning the Everglades under climate change and sea level rise. 2017 Greater Everglades Ecosystem Restoration Science Conference. Coral Springs, FL.

Osborne, T.Z., H.C. Fitz, S.E. Davis, III, and M.S. Ross. June 2015. Soil phosphorus and carbon responses to hydrologic management scenarios in Everglades restoration. 2015 Annual Meeting of the Society of Wetland Scientists. Providence, RI.

Fitz, H.C. January 2014. (poster). Model analysis of nutrient and hydrologic constraints on long-term planning for the Greater Everglades Ecosystem. Everglades Coalition 29th Annual Conference. Naples, FL.

Fitz. H.C., R. Paudel, and A. Loschiavo. June 2012. Model analysis of eutrophication constraints on an Everglades restoration project. 9th INTECOL International Wetlands Conference. Orlando, FL.

Paudel, R., H.C. Fitz, and R.K. Shrestha. June 2012. (poster). Predicting Everglades nutrient distributions in response to climate change projections. 9th INTECOL International Wetlands Conference. Orlando, FL.

Fitz. H.C. November 2011. Model analysis of eutrophication constraints on an Everglades restoration project. Coastal and Estuarine Research Federation 21th Biennial Conference. Daytona Beach, FL.

Fitz, H.C., and N. Guaita. November 2011. Applications of an integrated ecological landscape model to watershed analyses in Florida and Spain. Seminar Series, Fort Lauderdale Research and Education Center, University of Florida. Fort Lauderdale, FL.

Saha, A.K., Price, R.M., Fitz, H.C., Engel, V.C. 2010. A 2002-2008 hydrological budget and phosphorus residence times for Shark River Slough, Everglades National Park. 2010 Fall Meeting, American Geophysical Union, San Francisco, CA.

Fitz, H.C. February 2010. Everglades restoration: Adventures in model fantasy land (?). Seminar Series, Fort Lauderdale Research and Education Center, University of Florida. Fort Lauderdale, FL.

Fitz. H.C. and C.J. Madden. November 2009. Responses of Florida Bay ecosystem to a range of flows and phosphorus loads from the Everglades: linked wetland and estuarine models. Coastal and Estuarine Research Federation 20th Biennial Conference. Portland, OR.

Fitz, H.C. September 2007. Integrated ecological assessment in wetlands: the Everglades. 8th Annual Soil and Water Science Department Research Forum, University of Florida. Gainesville, FL.

Fitz, H. C. June 2006. Advances in integrated ecological assessment using the Everglades Landscape Model. 2006 Greater Everglades Ecosystem Restoration Science Conference. Lake Buena Vista, FL.

Fitz, H. C. April 2006. Advances in integrated ecological assessment using the Everglades Landscape Model. The 21st Annual Symposium of the International Association for Landscape Ecology. Mission Bay, CA.

Fitz, H. C., N. Wang, T. Waring and F.H. Sklar. May 2002. Everglades Landscape Model: Integrated assessment of hydrology, biogeochemistry, and biology. 2002 Spring Meeting of the American Geophysical Union. Washington, D.C.

Fitz, H. C., T. Waring, Y. Wu , F.H. Sklar,. December 2000. Application of the Everglades Landscape Model in restoration initiatives. Greater Everglades Ecosystem Restoration Science Conference. Naples, FL.

Fitz, H. C., F.H. Sklar, Y. Wu. October 1997. Evaluating Everglades ecosystem dynamics with spatial simulation models. The 14th Biennial International Conference of the Estuarine Research Federation. Providence, RI.

Fitz, H. C., F.H. Sklar, Y. Wu. May 1997. Evaluating Everglades ecosystem dynamics with spatial simulation models. Meeting of the Walt Dineen Society. Miami, FL.

Fitz, H.C., A.A. Voinov, R. Costanza. August 1996. Multi-scale sensitivity analysis of a dynamic spatial simulation model of the Everglades. Meeting of the Ecological Society of America. Boston, MA.

Boumans, R.M.J, R. Costanza, H.C. Fitz, T. Maxwell, A. Voinov, H. Voinov, L. A. Wainger. August 1996. Policy Analysis Tool: Integrated Ecological Economic Modeling. The 4th Biennial Meeting of the International Society for Ecological Economics. Boston MA.

Fitz, H.C., R. Costanza, A. Voinov, F. H. Sklar, T. Maxwell, and E. Reyes. August 1995. A dynamic spatial model of the Everglades landscape: a case study towards integrated ecological economic modeling. Tenth International Conference on State of the Art of Ecological Modeling (ISEM '95). Beijing, China.

Fitz, H.C., A. Voinov, R. Costanza, F. H. Sklar, T. Maxwell, and E. Reyes August 1995. A dynamic spatial model of the Everglades landscape. Forty sixth Annual Meeting of the American Institute of Biological Sciences. San Diego, California.

Fitz, H.C., E. Reyes, R. Costanza, and F.H. Sklar. October 1994. Landscape modeling in the Everglades. Third Biennial Meeting of The International Society for Ecological Economics, San José, Costa Rica.

Fitz, H.C., F.H. Sklar, E. Reyes, and R. Costanza. June 1994. Landscape modeling in the Everglades. First International Symposium on Ecosystem Health and Medicine: Integrating Science, Policy and Management. Ottawa, Ontario, Canada.

Sklar, F.H., and H.C. Fitz. June 1994. Landscape modeling in the Everglades. American Society of Limnology and Oceanography 1994 Meeting. Miami, Florida.

Sklar, F. H., C. Fitz, Y. Wu, K. Rutchey, and R. Costanza. March 1994. Components of an Everglades Landscape Model (ELM), Part I. Ninth Annual U.S. Landscape Ecology Symposium. Tucson, Arizona.

Fitz, H.C., F.H. Sklar, E. Reyes, and R. Costanza. March 1994. A dynamic spatial simulation model of the Everglades landscape, Part II. Ninth Annual U.S. Landscape Ecology Symposium. Tucson, Arizona.

Fitz, H.C. March 1993. Development of dynamic spatial simulation model of the Everglades landscape. Watershed '93: A National Conference on Watershed Management. Alexandria, Virginia.

Fitz, H.C., and R.G. Wiegert. October 1989. Blue crabs in a Georgia salt marsh: who's there, where they go, and what they eat. Tenth Biennial Estuarine Research Conference. Baltimore, Maryland.

Fitz, H.C., and R.G. Wiegert. February 1989. Habitat traps as a recruitment sampling device in Georgia salt marshes. 1989 Blue Crab Recruitment Workshop. Virginia Institute of Marine Science, Gloucester Point, Virginia.

Fitz, H.C., and R.G. Wiegert. May 1988. The utilization of a salt marsh by the blue crab. National Blue Crab Conference. Virginia Beach, Virginia.

Fitz, H.C., and R.G. Wiegert. October 1987. Population dynamics of the blue crab, *Callinectes sapidus*, in a Georgia salt marsh: mark-recapture using microwire tags. Ninth Biennial International Estuarine Research Conference. New Orleans, Louisiana.

Fitz, H.C., and R.G. Wiegert. June 1987. Population dynamics of the blue crab, *Callinectes sapidus*, in a Georgia salt marsh as determined by microwire tagging techniques. American Society of Limnology and Oceanography. Madison, Wisconsin.

Fitz, H.C., and R.G. Wiegert. March 1987. Movements of the blue crab, *Callinectes sapidus*, onto the intertidal salt marsh. Benthic Ecology Meeting. Raleigh, North Carolina.

GRANTS

EcoLandMod, Inc.

Fitz, H.C. Integrated modeling for FCE IV. National Science Foundation, Long Term Ecological Research program: consulting contract from Florida International University, under National Science Foundation "LTER: Coastal Oligotrophic Ecosystem Research", E. Gaiser, J. Kominoski, Lead PIs. 2021-2024.

Fitz, H.C. ELM Support to Everglades Foundation. Everglades Foundation. 11/2020-2/2021.

Fitz, H.C. Everglades Landscape Model:Model training support. Everglades Foundation. 2018-2019.

Fitz, H.C. Integrative multi-modeling for FCE IV. National Science Foundation, Long Term Ecological Research program: subaward from Florida International University, under National Science Foundation "LTERDrivers of abrupt change in the Florida Coastal Everglades", E. Gaiser, Lead PI. 2018-2019.

Fitz, H.C. Everglades Landscape Model: Installation and training. Everglades Foundation. 2016.

Fitz, H.C. Integrative multi-modeling for FCE III. National Science Foundation, Long Term Ecological Research program: subcontract from University of South Florida, under National Science Foundation LTER renewal entitled Florida Coastal Everglades III, E. Gaiser, Lead PI. 2014-2018.

Fitz, H.C. Modeling sulfur reductions to the Everglades using applications of the Everglades Landscape Model. U.S. Geological Survey, U.S. Dept. of the Interior. 2015.

Fitz, H.C. Incorporating Wading Bird Suitability into the Everglades Landscape Model. Everglades Systems Assessment Section, South Florida Water Management District. 2015.

Fitz, H.C. Synthesis of Everglades Research and Ecosystem Services (SERES): Soil responses to five Everglades restoration scenarios. Subcontract from the Everglades Foundation, funding from the Critical Ecosystem Studies Initiative, National Park Service, U.S. Dept. of the Interior. 2014.

University of Florida

Fitz, H.C. Integrative multi-modeling for FCE III. National Science Foundation, Long Term Ecological Research program: subcontract from Florida International University, under National Science Foundation LTER renewal entitled Florida Coastal Everglades III, E. Gaiser, Lead PI. 2013-2018. $248,965 (subcontract amount, but declined due to Fitz retirement from UF).

Fitz, H.C. Supplemental Extension to: Applying Everglades Landscape Model to Dynamically Integrate Hydrology, Water Quality, Soils, Periphyton, and Vegetation to Support Water Conservation Area 3A [development and application of sulfate module]. US Army Corps of Engineers, Engineer Research and Development Center. 2011-2012. $59,999.

Fitz, H.C. Applying Everglades Landscape Model to Dynamically Integrate Hydrology, Water Quality, Soils, Periphyton, and Vegetation to Support Water Conservation Area 3A. US Army Corps of Engineers, Engineer Research and Development Center. 2011-2012. $38,559.

Fitz, H.C. Ecological modeling support for Interagency Modeling Center (IMC). South Florida Water Management District, Interagency Modeling Center. 2008-2009. $113,000.

Fitz, H.C. Everglades Landscape Model (ELM) alternative modeling in support of Water Conservation Area 1 restoration. South Florida Water Management District, Everglades Research Division. Dec 2007 – Feb 2008. $27,000.

Fitz, H.C. Everglades Landscape Model (ELM) training. South Florida Water Management District, Interagency Modeling Center. Aug 2007. $6,750.

Fitz, H.C. Everglades Landscape Model support of ecological models for Everglades restoration. U.S. Geological Survey, Priority Ecosystem Science Program. 2007-2009. $50,000.

Prior to University of Florida/SFWMD

Fitz, H.C., and R. Ulanowicz. 1995 - 1996. Modeling physical attributes of Everglades habitats. National Biological Survey, Everglades National Park Field Station. $32,394.

Had a major role in the conceptualization, proposal preparation, data collection, analysis and interpretation of the following:

Wiegert, R.G. 1988. Recruitment of the blue crab, *Callinectes sapidus*, to a Georgia salt marsh: preliminary investigations. $10,000.

Wiegert, R.G. 1984-6; renewal 1986-7. The utilization of a salt marsh by the blue crab, *Callinectes sapidus*. Georgia Sea Grant College Program. $193,100.

COURSES TAUGHT

Statistical and Dynamic Approaches to Ecological Modeling. September 1999. Co-instructor with F. Gillet, D. Bourcard, O. Wildi. IIIe Cycle Romand en Sciences Biologiques. University of Neuchâtel, Switzerland.

AWARDS

1985: Merit award, University of Georgia. $2,000.
1984: Merit award, University of Georgia. $2,000.
1982-85: Three merit, non-teaching Graduate Assistantships, University of Georgia.

PROFESSIONAL SOCIETIES

Ecological Society of America (inactive as of 2013)
American Geophysical Union (inactive as of 2013)
American Association for the Advancement of Science (inactive as of 2013)
Coastal and Estuarine Research Federation (inactive as of 2013)

WWWEB

Ecological Landscape Modeling: Research and applications in integrated hydro-ecological landscape models. http://www.ecolandmod.com/