

# ***CURRICULUM VITAE***

## **William Michael Kemp**

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### ***I. Education***

1969            B.S. Georgia Institute of Technology, Civil Engineering.  
1971            M.S. Georgia Institute of Technology, Environmental Engineering.  
1977            Ph.D. University of Florida, Systems Ecology.

### ***II. Professional Background***

1970-1971      Environmental Engineer, U.S. Environmental Protection Agency,  
                    Boston, MA  
1977-1978      Post-Doctoral Research, Chesapeake Biological Laboratory, University  
                    of Maryland, Solomons, MD  
1978-1984      Assistant Professor, Horn Point Environmental Laboratories,  
                    University of Maryland, Cambridge, MD  
1985            Visiting Faculty, University of Copenhagen (Hillerød) and University  
                    of Aarhus, Denmark.  
1984-1989      Associate Professor, Horn Point Environmental Laboratories,  
                    University of Maryland, Cambridge, MD  
1998-1999      Sabbatical Scientist, Florida Center for Environ. Studies, Palm Beach Gardens  
1989-present   Full Professor, Horn Point Laboratory, Univ. of MD, Cambridge, MD.

### **Awards and Special Recognition**

1987-1989      Estuarine Research Federation Executive Board, Member At Large  
1992            Governor's Citation for Chesapeake Bay SAV Research.  
1990            Mathias Medal Award, Chesapeake Research Consortium, Award Nominee.  
1995            External Expert Member, Appointments Board, Univ. Stockholm, Sweden.  
1995 & 1996   Pew Foundations Fellowship in Conservation & Environment, Award Nominee  
1996            Royal Swedish Academy of Sciences, Crafoord Award (Sir Robert May), Invited  
                    Lecturer, Stockholm  
1999            "Distinguished Estuarine Scientist Sabbatical Award," Florida Center for Environmental  
                    Studies, Palm Beach Gardens  
2009            "Odum Award for Lifetime Achievement," Coastal and Estuarine Research Federation  
                    (shared with Walter Boynton)  
2012            "Faculty Award for Research, Scholarship and Creative Activity," University System of  
                    Maryland Board of Regents

### **III. Research**

#### **A. Areas of Professional Expertise**

Coastal marine ecology: Ecosystem production; Nutrient cycling; Physical-biological coupling; Global patterns; Benthic-pelagic interactions.

Ecosystem analysis: Numerical models; Comparative assessment; Scaling relations.

Seagrass ecology: Light and nutrient relations; Food-webs; Plant-sediment biogeochemistry.

Sediment nitrogen cycling: Nitrification-denitrification; N-interactions with plants and macrofauna.

#### **B. Published Work**

##### 1. Peer-Reviewed Articles and Chapters (144: 2014)

Kemp, W.M., and W.R. Boynton. 2012. Synthesis in estuarine and coastal ecological research: What is it, why is it important and how do we teach it? *Estuaries and Coasts*. 35:1–22.

Kemp, W.M., and W.R. Boynton. 2012. Erratum to: Synthesis in estuarine and coastal ecological research. *Estuaries and Coasts*. 35:1–22. DOI 10.1007/s12237-011-9464-9

Testa, J.M., and W.M. Kemp. 2012. Hypoxia-induced shifts in nitrogen and phosphorus cycling in Chesapeake Bay. *Limnology and Oceanography*. 57: 835-850.

Kemp W.M. and Testa J.M. 2011. Metabolic balance between ecosystem production and consumption. In: Wolanski E and McLusky DS (eds.) *Treatise on Estuarine and Coastal Science*, Vol 7, pp. 83–118. Waltham: Academic Press.

Testa J.M. and Kemp W.M. 2011. Oxygen – Dynamics and biogeochemical consequences. In: Wolanski E and McLusky DS (eds.) *Treatise on Estuarine and Coastal Science*, Vol 5, pp. 163–199. Waltham: Academic Press.

Borum, J., R. Gruber, W.M. Kemp. 2012. Seagrass and related submersed vascular plants, pp. 111-127 (Ch. 5), In: J.W. Day, Jr., B.C. Crump, W. M. Kemp, and A. Yanez-Arancibia (eds.) *Estuarine Ecology*, 2<sup>nd</sup> Edition. Hoboken, NJ: Wiley & Sons.

Day, J.W., A. Yanez-Arancibia, W.M. Kemp and B.C. Crump. 2012. Introduction to estuarine ecology, pp.1-18 (Ch. 1), In: J.W. Day, Jr., B.C. Crump, W. M. Kemp, and A. Yanez-Arancibia (eds.) *Estuarine Ecology*, 2<sup>nd</sup> Edition. Hoboken, NJ: Wiley & Sons.

Testa, J.M., W.M. Kemp, C.S. Hopkinson, and S.V. Smith. 2012. Ecosystem metabolism. pp. 381-416 (Ch. 15), In: J.W. Day, Jr., B.C. Crump, W. M. Kemp, and A. Yanez-Arancibia (eds.) *Estuarine Ecology*, 2<sup>nd</sup> Edition. Hoboken, NJ: Wiley & Sons.

Hagy, J.D., and W.M. Kemp. 2012. Estuarine food webs, pp. 417-441 (Ch. 16), In: J.W. Day, Jr., B.C. Crump, W. M. Kemp, and A. Yanez-Arancibia (eds.) *Estuarine Ecology*, 2<sup>nd</sup> Edition. Hoboken, NJ: Wiley & Sons.

Day, J.W., A. Yanez-Arancibia, and W.M. Kemp. 2012. Human impact and management of coastal and estuarine ecosystems, pp.483-495 (Ch. 19), In: J.W. Day, Jr., B.C. Crump, W. M. Kemp, and A. Yanez-Arancibia (eds.) *Estuarine Ecology*, 2<sup>nd</sup> Edition. Hoboken, NJ: Wiley & Sons.

Brady, D.C., J. Testa, D. Di Toro, W. Boynton, M. Kemp. 2012. Sediment flux modeling: Calibration and application for coastal systems. *Estuarine and Coastal Shelf Science*. 24: 1-18.

Testa, J.M., D. Brady, D. Di Toro, W. Boynton, J. Cornwell, W.M. Kemp. 2013. Sediment flux modeling: Simulating nitrogen, phosphorus, and silica cycles. *Estuarine and Coastal Shelf Science*. 25: 1-19. DOI.org/10.1016/j.ecss.2013.06.0

- \*Testa, J.M. and W.M. Kemp. 2014. Water column oxygen depletion rates in Chesapeake Bay: Controls and spatial/temporal variability. *Estuaries and Coasts*. DOI 10.1007/s12237-014-9775-8
- \*Gurbisz, C. and W.M. Kemp. 2014. Unexpected resurgence of a large submersed plant bed in Chesapeake Bay: Analysis of time series data. *Limnology and Oceanography*. 59:482-494.
- \*\*Bosch, J. A., J. C. Cornwell, W. M. Kemp. 2014. Short-term effects of Nereid polychaete size and density on sediment inorganic nitrogen cycling under varying oxygen conditions. *Marine Ecology Progress Series*. DOI:0.3354/meps11185.
- \*\*Testa, J.M., Y. Li, Y-J Lee, M. Li, D. Brady, D. Di Toro, W.M. Kemp, J. Fitzpatrick. 2014. Quantifying the effects of nutrient loading and carbon production on dissolved oxygen in Chesapeake Bay using a coupled hydrodynamic-biogeochemical model. *Journal of Marine Systems*. 139: 139-158.
- \*\*Li, Y., M. Li and W. M. Kemp. 2014. A budget analysis of bottom-water dissolved oxygen in Chesapeake Bay. *Estuaries and Coasts*. DOI 10.1007/s12237-014-9928-9.
- \*\*Herrmann, M., R. Najjar, W. M. Kemp, R. Alexander, E. Boyer, W-J. Cai, P. Griffith, K. Kroeger, S. L. McCallister, R. Smith. 2014. Net ecosystem production and organic carbon balance of U.S. east coast estuaries: A synthesis approach. *Global Biogeochemical Cycles*. DOI: 10.1002/2013GB004736.
- \*Li, M., Testa, J., Lee, Y, Li, Y., E.M. Kemp. 2015. Geophysical Research Letters. What drives interannual variability of estuarine hypoxia: Climate forcing versus nutrient loading? 2014GL062378 (In revision).

## 2. Other Invited Chapters and Articles (22: 2014)

Harris, L. and M. Kemp 2012. Obituary: Scott W. Nixon, 1943-2012. *ASLO Bulletin*. 21: 88-89.

## 3. Professional Books (4):

Day, J.W., B. C. Crump, W.M. Kemp and A. Yanez-Arancibia (eds.) 2013 . *Estuarine Ecology*. Second Edition, John Wiley and Sons, Hoboken, NJ.

## C. **Contracts and Grants**

### 1. Current

- \*Kemp, M. and J. Cornwell. Role of a resilient submersed plant bed in mitigating the effects of increasing river-borne particulate inputs to Chesapeake Bay: Nutrient cycling. NOAA, MDSG. 24 mo. Feb 2014-Jan 2016, \$160,731.
- \*Kemp, M., W. Boynton. Coupling coastal carbon, nitrogen and phosphorus cycles: Climate change and trophic implications. NSF-OPUS. 24 mo, Feb 2014-Jan 2016. \$198,913.
- \*Ball, W, C. Harman, L. Wainger, M. Kemp, J. Testa, L. Murray, J/ Shortle, A. Ortiz-Bobea. WSC Category 3 Collaborative: Impacts of climate change on the phenology of linked agriculture-water systems. NSF, 48 mo. Jun 2014 –May 2018. \$782,000 to UMCES (\$174,300 for Kemp part).
- \*Najjar, R., M. Kemp et al. The carbon budget of tidal wetlands and estuaries of the contiguous United States: a synthesis approach. NASA Roses. 36 mo. July 2014-June 2017, \$1,214,388 total budget (\$93,000 for Kemp part).
- \*Testa, J. and M. Kemp (Cornwell, Lead PI). What are the integrated water quality effects of particulate carbon, nitrogen and phosphorus discharged over the Conowingo Dam? MD Dept. Natural Resources, 18 mo, Feb 2015- Aug 2016, (\$42,144 for Kemp part).
- \*Kemp, M. Chesapeake Bay SAV restoration: Climate change, ecosystem services, knowledge gaps—a third technical synthesis. MD DNR Jul '14 – Dec '15 (\$5,500).

2. Submitted (Pending)

\*Testa, J., W-J. Cai, G. Waldbusser, J. Cornwell, M. Li, W.M. Kemp. Interactions between ocean acidification and eutrophication in estuaries: Modeling opportunities and limitations for shellfish restoration, NOAA CSCOR, 36 mo. Sep 2015 – Aug 2018, \$1,492,710 total science budget (\$126,000 for Kemp part).

**D. Seminars and Presentations**

1. Invited Seminars:

Kemp, W.M. 2012. Degradation and restoration of Chesapeake Bay ecosystem. School of Science Seminar Series, Salisbury University (February).

Kemp, W.M. 2013. Coastal hypoxia: Patterns, trends and controls. University of Maryland, Earth System Science Interdisciplinary Center, ESSIC, College Park, MD (February).

Kemp, W.M. 2013. Seasonal hypoxia in Chesapeake Bay: Patterns, trends and controls. Old Dominion University, Dept. of Ocean, Earth and Atmospheric Sciences, Norfolk, VA (March).

\*Kemp, W.M. 2015. Factors regulating hypoxia in Chesapeake Bay and coastal waters worldwide. University of Delaware, School of Marine Science and Policy. Lewes, DE (April).

2. Presentations at Professional Meetings (Unpublished)

Hermann, M, R. Najjar, W.M. Kemp, S.L. McCallister, E. Hall. 2012. Net ecosystem production of U.S. East Coast estuaries. Ocean Carbon Biogeochemistry Workshop, Woods Hole, MA (July).

Najjar, R., M. Friedrichs, W-J Cai, D. Butman, K. Kroeger, M. Kemp, M. Herrmann, L. McCallister, Z.A. Wang, S. Signorini, C. Pilskaln, D. Burdige, P. Vlahos, R. Vaillancourt. 2013. The carbon budget for coastal waters of the eastern United States. North American Carbon Program Meeting: The Next Decade of Carbon Cycle Research: From Understanding to Application, Albuquerque, NM (Feb).

Brady, D., T. Targett, D. DiToro, M. Kemp. 2013. Coupling spatial and temporal dynamics of hypoxia with juvenile estuary-dependent fish behavior. ASLO Aquatic Sciences Meeting, New Orleans (Feb).

Gurbisz, C and W. M. Kemp. 2013. Impacts of extreme weather on a large submersed plant bed in Chesapeake Bay: Analysis of time series data. ASLO Aquatic Sciences Meeting, New Orleans (Feb).

DiFalco, S., C. Gurbisz and W. M. Kemp. 2013. Effects of extreme weather on a large submersed plant bed in Chesapeake Bay: Field observations. ASLO Aquatic Sciences Meeting, New Orleans (Feb).

Testa, J., Y. Li., Y. Lee, M. Li, W. M. Kemp. 2013. Exploring physical and biological controls on Chesapeake Bay hypoxia using a hydrodynamic-biogeochemical model. ASLO Aquatic Sciences Meeting, New Orleans (Feb).

Kemp, W.M. 2013. Inferring ecological responses to changes in climate and nutrients in Chesapeake Bay: Examples for hypoxia and submersed plant abundance. Invited Plenary Talk, Atlantic Estuarine Research Society, Williamsburg, VA (Apr).

Gurbisz, C., W.M. Kemp. 2013. Impacts of extreme weather on a large submersed plant bed in Chesapeake Bay: Analysis of time series data. Atlantic Estuarine Research Society, Williamsburg, VA (Apr). (Best Student Presentation Award).

- Gurbisz, C., W. M. Kemp 2013. Bio-physical interactions in a large submersed plant bed in upper Chesapeake Bay. Coastal and Estuarine Research Federation meeting, San Diego, CA (Nov).
- Bosch, J., W.M. Kemp. 2013. Environmental controls of polychaete communities in a eutrophic mesohaline estuarine system: Variation with depth. Coastal and Estuarine Research Federation meeting, San Diego, CA (Nov).
- Kemp, W.M. and W.R. Boynton. 2013. Synthesis research in coastal and estuarine science: An overview. Coastal and Estuarine Research Federation meeting, San Diego, CA (Nov).
- Testa, J. and W.M. Kemp. 2013. Hypoxia and nutrient cycling in coastal ecosystems: Insights gained from integrating observations, retrospective analysis, and numerical modeling. Coastal and Estuarine Research Federation meeting, San Diego, CA (Nov).
- \*Herrmann, M., R. Najjar, W. M. Kemp, R. Alexander, E. Boyer, W.-J. Cai, P. Griffith, S. L. McAllister, and R. Smith. 2014. Net ecosystem production and organic carbon balance of U.S. East Coast estuaries: A synthesis approach. Ocean Science Meeting, Hawaii (Feb).
- \*Gurbisz, C. and W.M. Kemp. 2014. Quantifying resilience as an indicator of ecosystem status. AERS Meeting, Ocean City, MD (Apr).
- \*Kemp, W.M. 2014. Net ecosystem production in estuarine and coastal systems. Coastal Carbon Synthesis Community Workshop. WHOI, Woods Hole, MA (August).
- \*Testa, J., Y. Lee, M. Li, and W.M. Kemp. 2014. Quantifying biological and physical controls on dissolved oxygen in Chesapeake Bay using a coupled hydrodynamic-biogeochemical model. International Hypoxia Meeting. Liege, Belgium (May).

### 3. Invited Workshops (Unpublished):

- US East Coast Carbon Cycle Synthesis workshop, Estuaries and wetlands session co-chair , Sponsored by NASA, VIMS Gloucester Pt, VA (January 2012).
- USEPA, National Center for Environmental Economics, Nutrient-Fish Expert Panel, Computing economic benefits of Chesapeake Bay TMDL Process, Annapolis, MD (January 2013).
- NOAA, CSCOR, Northern Gulf of Mexico Hypoxia Modeling External Advisory Committee, Stennis, MS (Apr 2013).

## **E. Symposia Organized/Chaired for Professional Meetings**

- Fitzpatrick, J., M. Kemp, E. Turner. 2011. (Town Hall Meeting organizers). Forecasting scenarios for estuarine and coastal management: Can we focus the crystal ball? Coastal and Estuarine Research Federation Meeting, Daytona Beach, FL (Nov).
- Kemp, M. and W. Boynton (co-chairs). 2013. Synthesis research in coastal and estuarine science. Coastal and Estuarine Research Federation meeting, San Diego, CA (Nov).
- \*Testa, J., D. Brady, and W.M. Kemp (Co-chairs). 2015. Timing is everything: Phenology in coastal marine ecosystems, Special Session, Coastal and Estuarine Research Federation Meeting, Portland, OR (Nov).
- \*Gurbisz, C., and W.M. Kemp (co-chairs). 2015. Thresholds and feedback processes in coastal and estuarine systems, Special Session, Coastal and Estuarine Research Federation Meeting, Portland, OR (Nov).

## ***IV. Teaching and Training***

1982- Associate Member, Graduate Faculty, University of Maryland, CP  
 1990- Associate Member, UMCES Graduate Faculty

**A. University of Maryland Courses**

Course No.	Title	Institution	Semester	Enrollment	Credit	Co-Instructor or TA	No. of Lectures
*MEES 611	Estuar Systems Ecology	HPL	Sp '15	16	3	J. Testa	26 <sup>†</sup>
*MEES 698	Ecosystem Restoration	UMCP	F ' 11	≈ 10	3	S. Kausal	3 <sup>#</sup>
*MEES 608	Synthesis Res Coast Sci	HPL/CBL	S '14	9	1	W. Boynton	15 <sup>†</sup>

\* Organized course, primary lecturer, responsible for grades.

# Guest lecturer for course organized by colleague.

† Co-organizer of course, shared responsibilities.

**C. Graduate Students Supervised as Major Advisor (24 total)**

1. Degrees Conferred

Testa, Jeremy, PhD—2013, UMCP, MEES, "Dissolved oxygen and nutrient cycling in Chesapeake Bay: An examination of controls and biogeochemical impacts using retrospective analysis and numerical models." Current Position: Asst. Professor, Chesapeake Biological Lab, Solomons, MD.

\*Bosch, Jennifer, PhD—2014, UMCP, MEES, "Polychaetes, hypoxia, and nitrogen cycling in the mesohaline Chesapeake Bay" Current position: Ecologist, NOAA Silver Spring, MD.

2. Current Advisees

\*Gurbisz, Cassie, PhD, UMCP, MEES, Expected graduation, 2015

3. Current Graduate Student Committee Membership

Bryan, Jennifer MS (L. Harris) MEES, UMCES, CBL

4. Undergraduate Interns Advised (36 total)

2012 Steven DiFalco, REU, Suny College, New Paltz

5. Post-Docs Advised (6 total)

## ***V. Outreach and Service***

### **A. Editorships**

\**Ophelia*, Editorial Board Member (2000-present).

\**Marine Ecology Progress Series*, Contributing Editor (2007-present)

### **B. Public Service**

Maryland Saltwater Sport-fisherman's Association. 2011. Presentation to monthly meeting. W. M. Kemp, "Dead-zones in coastal waters of the world: Case study of Chesapeake Bay., Cambridge, MD (June).

COMPASS, Communication Partnership for Science and the Sea. 2011. Taking the Long View of Ecosystem Restoration in the Gulf of Mexico and Beyond. "Jump-starting ecosystem recovery: Lessons learned from Chesapeake Bay." W.M. Kemp. Congressional Briefing, Capital Visitors Center, Washington, DC (October).

Waterfowl Festival. 2012. Horn Point Environmental Lab, Display on Linking SAV Restoration to Waterfowl Abundance, Easton, MD (Nov).

### **C. Federal/State/Local Government**

US EPA CBP. 2011. "Chesapeake watershed climate change analysis." W.M. Kemp. Presentation to *Modeling Subcommittee* (April).

Scientific and Technical Advisory Committee of the Chesapeake Bay Program. 2011. "Thresholds and non-linear recovery of eutrophic coastal ecosystems," Presentation (June).

NOAA Chesapeake Bay EcoCheck. 2012. Review of Bay Hypoxia predictions and controlling processes, Annapolis (Oct).

BayStat. New Directions for "Bay Report Card." 2012. Invited Workshop, Annapolis (Dec).

### **D. National**

Water Environment Research Foundation. 2011-2012, TMDL Modeling Project. External Advisory Committee (2011-2012).

National Science Foundation. National Socio-Environmental Synthesis Center, Annapolis, MD. External Advisory Board (2011-2013).

\*Georgia Coastal Ecosystem LTER, National Science Foundation, External Advisory Committee, Athens, GA (2012-2015).

### **E. International**

External Opponent, PhD Defense. 2012. Dept. of Biology, University of Copenhagen (June)

### **F. University of Maryland System**

\*MEES Oceanography AOS Admissions Committee (2010-2015)

\*MEES Curriculum Committee USM wide, Nov '13- Feb '15

## **G. UMCES and Horn Point Laboratory**

### 1. UMCES

CBL Estuarine Systems Ecologist Faculty Search Committee (2012-2013)

\*AL Emeritus status Review Committee member (2014)

\*UMCES Database Management Committee, Chair (2014)

\*UMCES Academic Accreditation Self-Study WG4 (2014-)

### 2. Horn Point Laboratory Committees

\*HPL, Emeritus status Review Committee, Chair (2013)

\*HPL Marine Microbial Ecologist Faculty Search Committee, Chair (2013-2014)

\*Education Committee (1999-2004; 2015)

### 3. Other UMCES/HPL Activities

STEM Institute. 2012. Presentation to Dorchester Co. HS science teachers. Land-water connections and Dead Zones (Jul).

Chesapeake Science for Non-Scientists. 2012 (Linda Starling). Degradation and restoration of Chesapeake Bay: An overview (Apr).

## **H. Other Professional Services**

### 1. Proposal Reviews

**2012** NSF Oceanography (Apr)

**2013** NOAA Sea Grant Woods Hole (Jul)

NOAA Sea Grant NY (Apr)

CRC Pub Book proposal (Jan)

NSF Ecosystems proposal (Nov)

### 2. Manuscript Reviews

**2012** Hydrobiol. (Apr)

E&C (May)

JGR (Oct)

JAWRA (May, Oct)

MEPS (Nov)

JGR (Dec)

**2013** ES&T (Apr, May)

L&O (Mar)

L&O (Nov)

Biogeosciences (Sep)

\*2014 BioScience (May, Jun)

Biological Reviews (Dec)

L&O (Jan)

### 3. External Advisor, Promotion and PhD Committees

2012 (1)



2013 (2)  
\*2014