

**ALISON M. CUPPLES**  
*Curriculum Vitae*

**ADDRESS AND CONTACT DETAILS**

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**APPOINTMENTS**

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2006- Present	Assistant Professor	Department of Civil and Environmental Engineering, Michigan State University
2003-2006	Postdoctoral Fellow (Environmental Microbiologist)	USDA-ARS, University of Illinois, Urbana-Champaign (UIUC)

**ACADEMIC BACKGROUND**

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Ph.D.	2003	Environmental Engineering and Science, Stanford University
M.S.	1999	Natural Resources and Environmental Sciences, University of Illinois
B.S.	1997	Environmental Sciences, University of East Anglia, England

**RESEARCH INTERESTS**

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**H-index: 10**

The application of microbiology to understand and treat soil and water contamination

- Identification of the microorganisms & functional genes involved in biodegradation
  - Traditional, problematic contaminants (chlorinated solvents, BTEX, MTBE, RDX)
  - Emerging contaminants (antimicrobials and 1,4-dioxane)
- Effect of redox conditions and co-contamination on key degrading species and degradation rates
- Application of novel molecular methods to environmental microbiology
  - Quantitative PCR, terminal restriction fragment length polymorphism, stable isotope probing
- Occurrence and fate of emerging contaminants in engineered and natural systems

**PROPOSALS**

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**Funded, Active Proposals**

1/2012-7/2014	Development of biomarkers for assessing <i>In Situ</i> RDX biodegradation potential (white paper), <b>Sole PI</b>	SERDP
8/2011-3/2012	Use of X-ray absorption spectrometry to study the reduction of U(VI) by zero valent iron, <b>Co-PI</b> w/ M. Baumann, B. Teppen, H. Li, S. Davies, S. Masten (lead)	CSW, ESPP
8/2011-5/2012	The use of active learning to address ABET CLO's, <b>Sole PI</b>	Lilly, MSU
1/2011-12/2013	Bioaccumulation of antimicrobials by vegetables and fruits: potential and relevance to human health and environmental fate, <b>Co- PI (20%)</b> , w/ H. Li (20%) and D. Reinhold (lead, 60%),	USDA
08/2009-08/2012	Stable isotope probing to assess bioremediation of LUST contaminants, <b>Sole PI</b>	NSF

## Funded, Completed Projects

7/1/2008- 6/30/2009	Role of plants in migration of antimicrobials from land-applied biosolids, <b>Co-PI</b> w/ D. Reinhold (lead)	CWS, MSU
5/20/2008- 12/31/2009	Development of biomarkers for assessing <i>in situ</i> RDX biodegradation potential, <b>Sole PI</b>	SERDP
8/27/2007-12/30/2008	Occurrence and fate of the emerging contaminant triclocarban in biosolids, <b>Lead PI</b> w/ collaborator Hui Li	IRGP, MSU
6/30/2007-2/28/2010	Evaluating the environmental persistence of antimicrobials in land applied biosolids, <b>Lead PI</b> w/co-PIs, Mantha, Voice, Li, Erickson	CWS, MSU

## AWARDS

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2011-2012	Lilly Teaching Fellow, MSU
2011	Excellence in Review Award, <i>Environmental Science &amp; Technology</i> , June 2011
2009	North American Endowment Environmental Engineering Travel Award
2005	Superior Research in Environmental Microbiology, Monetary Award, USDA-ARS
2004	Superior Research Accomplishments in Microbiology, Monetary Award, USDA-ARS
1999-2003	Research Assistantships (tuition & stipend) Stanford
1997-1999	Research Assistantships (tuition & stipend) UIUC
1998-1999	Graduate Fellowship, UIUC
1998	Alumni Award for Graduate Student Travel, UIUC

## PUBLICATIONS

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### Peer-Reviewed Publications

		IF <sup>+</sup>	C*
19	Sun, W., Sun, X. and <b>A. M. Cupples</b> . Anaerobic MTBE degrading microorganisms identified in wastewater treatment plant samples using stable isotope probing, <i>Applied and Environmental Microbiology</i> , <i>in press</i>	3.686	0
18	Sun, W. and <b>A. M. Cupples</b> . 2012. Diversity of five anaerobic toluene degrading microbial communities investigated using stable isotope probing (SIP), <i>Applied and Environmental Microbiology</i> , 78: 972-980.	3.686	0
17	<b>Cupples, A. M.</b> 2011. The use of nucleic acid based stable isotope probing to identify the microorganisms responsible for anaerobic benzene and toluene biodegradation, <i>Journal of Microbiological Methods</i> , 85, 83-91.	2.427	1
16	Xie, S., W. Sun, C. Luo and <b>A. M. Cupples</b> . 2011. Novel aerobic benzene degrading microorganisms identified in three soils by stable isotope probing, <i>Biodegradation</i> , 22, 71-81.	1.873	3
15	Cha, J. and <b>A. M. Cupples</b> . 2010. Triclocarban and triclosan biodegradation at field concentrations and the resulting leaching potentials in three agricultural soils, <i>Chemosphere</i> , 81, 494-499.	3.253	1
14	Xie, S., W. Sun, C. Luo and <b>A. M. Cupples</b> . 2010. Stable isotope probing identifies novel <i>m</i> -xylene degraders in soil microcosms from contaminated and uncontaminated sites, <i>Water, Air and Soil Pollution</i> , 212, 113-122.	1.676	6
13	Sun, W., S. Xie, C. Luo and <b>A. M. Cupples</b> . 2010. Direct link between toluene	3.686	2

degradation in contaminated-site microcosms and a *Polaromonas* strain, *Applied and Environmental Microbiology*, 76: 956-959.

12 Luo, C., S. Xie, W. Sun, X. Li and **A. M. Cupples**. 2009. Identification of a novel toluene-degrading bacterium from the candidate phylum TM7 as determined by DNA-stable isotope probing, *Applied and Environmental Microbiology*, 75: 4644-4647. 3.686 12

11 Cha, J. and **A. M. Cupples**. 2009. Detection of the antimicrobials triclocarban and triclosan in agricultural soils following land application of municipal biosolids, *Water Research*, 43: 2522-2530. 4.353 26

10 **Cupples, A. M.** 2008. Real-time PCR quantification of *Dehalococcoides* populations: methods and applications. *Journal of Microbiological Methods*, 72: 1-11. 2.427 23

9 **Cupples, A. M.**, E. A. Shaffer, J. C. Chee-Sanford, and G. K. Sims. 2007. DNA buoyant density shifts during <sup>15</sup>N DNA stable isotope probing. *Microbiological Research*, 162: 328-334. 1.771 10

8 **Cupples, A. M.** and G. K. Sims. 2007. Identification of *in situ* 2,4-dichlorophenoxyacetic acid-degrading soil microorganisms using DNA-stable isotope probing. *Soil Biology and Biochemistry*, 39: 232-238. 2.978 27

7 **Cupples, A. M.**, R. A. Sanford, and G. K. Sims. 2005. Dehalogenation of the herbicides bromoxynil (3,5-dibromo-4-hydroxybenzotrile) and ioxynil (3,5-diiodino-4-hydroxybenzotrile) by *Desulfitobacterium chlororespirans*. *Applied and Environmental Microbiology*. 71: 3741-3746. 3.686 13

6 **Cupples, A. M.**, A. M. Spormann and P. L. McCarty. 2004. Comparative evaluation of chloroethene dechlorination to ethene by *Dehalococcoides*-like microorganisms. *Environmental Science and Technology*, 38: 4768-4774. 4.630 34

5 **Cupples, A. M.**, A. M. Spormann and P. L. McCarty. 2004. Vinyl chloride and *cis*-dichloroethene dechlorination kinetics and microorganism growth under substrate limiting conditions. *Environmental Science and Technology*, 38: 1102-1107. 4.630 52

4 **Cupples, A. M.**, A. M. Spormann, and P. L. McCarty. 2003. Growth of a *Dehalococcoides*-like microorganism on vinyl chloride and *cis*-dichloroethene as electron acceptors as determined by competitive PCR. *Applied and Environmental Microbiology*. 69: 953-959. 3.686 115

3 **Cupples, A. M.**, G. K. Sims, R. P. Hultgen and S. E. Hart. 2000. Effect of soil conditions of the degradation of chloransulam-methyl. *Journal of Environmental Quality* 29: 786- 794. 2.291 20

2 Sims, G. K. and **A. M. Cupples**. 1999. Factors controlling degradation of pesticides in soil. *Pesticide Science* 55: 598-601.

1 David, M. B., **A. M. Cupples**, G. B. Lawrence, G. Shi, K. Vogt and P. M. Wargo. 1998. Effect of chronic nitrogen additions on soil nitrogen fractions in Red Spruce stands. *Water, Air and Soil Pollution* 105: 183-192. 1.676 2

† Impact factor of the journal, \*Number of citations (October 2011)

### Book Chapters, Reports and Conference Proceedings

- 5 **Cupples, A. M.** Final Report SERDP. **2010.** Development of biomarkers for assessing in situ RDX biodegradation potential. Project Number: ER 1606 (**final report**).
- 4 Shaffer, E., G. K. Sims, **A. M. Cupples**, C. Smyth, J. Chee-Sanford and A. Skinner. **2010.** Atrazine biodegradation in a Cisne soil exposed to a major spill. International Journal of Soil, Sediment and Water (**conference proceeding**).
- 3 **Cupples, A. M.**, J. B. Rose, and I. Xagorarakis. **2010.** New molecular methods for detection of water-borne pathogens, Environmental Microbiology, Wiley Publications (**book chapter**).
- 2 Sims, G. K., R. P. Hultgren, **A. M. Cupples**, and R. J. Hudson. **2001.** Role of ionization in bacterial uptake and soil sorption of agrochemicals. pp. 268-270 Proc. 3rd Int. Conf. on Groundwater Qual., Univ. of Sheffield, UK (**conference proceeding**).
- 1 Hultgren, R. P., E. Elverson, **A. M. Cupples**, R. J. Hudson, and G. K. Sims. **2000.** Bacterial uptake and soil sorption of ionizable agrochemicals. In Specialty Chemicals. Symp. Proc. Am. Chem. Soc. 40(1):192-194 (**conference proceeding**).

### Manuscripts Submitted or in Preparation

- 3 Seyrig, G., Stedtfeld, R. D., Ahmad, F., Turlousse, D. M., Towery, K. L., **Cupples, A. M.**, Tiedje, J. M. and S. A. Hashsham. Evaluation of fluorescent DNA dyes to enhance speed and efficiency of real-time loop-mediated isothermal amplification. *Submitted*.
- 2 Sun, W., Sun, X. and **Cupples, A. M.** Presence, diversity and the enumeration of toluene degrading functional genes (*bssA* and *bamA*) across a range of redox conditions and inoculum sources. *In preparation*.
- 1 Jayamani, I., Sun, W. and **Cupples, A. M.** The effect of the proposed gasoline additive isobutanol on anaerobic toluene degrading communities. *In preparation*.

### TEACHING

	<u>Date</u>	<u>Students</u>	<u>SIRS (4.0)</u>
<b><u>Graduate Courses</u></b>			
CE 890 Traditional & Emerging <i>in Situ</i> Remediation Methods	Spr. 2011	18	3.93
<b><u>Undergraduate Courses</u></b>			
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2012	21	-
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2011	20	3.94
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2010	20	3.81
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2009	13	3.92
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2008	18	3.79
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2007	14	3.38
CE 487 Microbiology for Environmental Eng. & Science	Spr. 2006	11	3.50
CE 280 Principles of Environmental Eng. & Science	Fa. 2011	77	-
CE 280 Principles of Environmental Eng. & Science	Fa. 2010	78	3.78
CE 280 Principles of Environmental Eng. & Science	Fa. 2009	99	3.07
CE 280 Principles of Environmental Eng. & Science	Fa. 2008	75	3.15
CE 280 Principles of Environmental Eng. & Science	Fa. 2007	63	3.26
CE 280 Principles of Environmental Eng. & Science	Fa. 2006	64	3.54

Guest lectures (substitute teaching) in CE 280	
K-12 presentations in various summer programs (see below)	2008-2011
Laboratory sessions for High School Engineering Institute	2008
Guest lectures in Soil Microbiology (UIUC)	2003
Teaching assistant for Environ. Micro. (Stanford University)	2001

**Scholarship of Teaching and Learning (SoTL) Project** (CE 280, Fall 2011)

“Active Learning in a Large Environmental Engineering Undergraduate Class to Enhance Achievement of ABET\* Course Learning Objectives (CLOs)”

\*ABET - Accreditation Board for Engineering and Technology

**ADVISING**

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**Visiting Scholars**

Shuguang Xie	2008-2009
Chunling Luo	2008

**Postdoctoral**

Jongmun Cha	2007-2010
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**Ph.D. Students**

Weimin Sun	2006- 2011
Indu Jayamani	2010-present
Fernanda Paes	2009-present

**M.S. Students**

Xiacao Sun	2009-2011
Indu Jayamani	2007-2009
Melissa Knapp	2007-2009

**Undergraduates**

Hanna Miller	2011
Daniel Williams	2007
Fred Simmons	2008
Emeka Ezekwemba	2006

**Honor Students**

Sam Jablonowski	Fa. 2011
Julie Jensen	Fa. 2008
Nicholas Tecca	Fa. 2008
Micheal Krcmarik	Fa. 2008
Sarah Buddenborg	Spr. 2007
Carolyn Biesecker	Spr. 2007

**Other**

Jennifer Xu	2008
Mike Manzella	2008

## **OUTREACH AND SERVICE ACTIVITIES**

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### **1) Institutional Service**

#### *Summer K-12 Activities*

Numerous K-12 summer outreach teaching activities. Efforts have involved:

- Formal presentations on environmental engineering,
- Question and answer sessions on environmental engineering,
- One week of hands-on laboratory experience with the help of graduate students
- Tours of the department's research facilities and
- Facilitating interactions and mentoring activities with graduate students

The summer K-12 programs have included:

- High School Engineering Institute (2008)
- High School Engineering Exploration (2010)
- High School Immersion Programs (2010)
- Wireless Integrated MicroSystems (WIMS) for TEENS Program (2008, 2010)
- Woman in Engineering Summer Residential Program (WIE) (2008)
- Spartan Engineering for Teens (2011)

Other activities include:

- Alumni Distinguished Scholars Program (ADS) Receptions (2009, 2010, 2011, 2012)
- Spartan Future Engineers Preview Days (2009, 2010)
- Undergraduate commencements (2009, 2010, 2011)
- Woman Faculty Panel for Woman in Engineering Summer Program (2009)

#### *Other Institutional Service*

- Search Committee Hannah Professor in Sustainable Water Engineering (Current)
- University Awards Committee to select Excellence-in-Teaching Citations (2011-2012)
- CEE Graduate Studies Committee (2010-present)
- CEE Advisory Committee (2010)
- College Undergraduate Awards & Financial Aid (2008-present)
- Associate Dean for Research and Graduate Studies Search Committee (2008)

### **2) Professional Service**

**60 Manuscript Reviews (number, year)**

#### **Proposal Reviews**

- IRGP, MSU
- Center for Water Sciences, MSU
- EPA (SBIR: Drinking Water and Water Monitoring)
- NSF (Environmental Engineering within CBET)
- Army Research Office

- UW RGI

**Conference Service**

- Co-chair of session on “Applying Molecular Methods to Understand the Microbial Communities Involved in Contaminant Degradation” Battelle Conference on Bioremediation and Sustainable Environmental Technologies, June 2011

**Professional Society Membership**

- American Society for Microbiology
- Association of Environmental Engineering and Science Professors
- Center for Water Sciences (MSU)