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# ENVIRONMENTAL Science & Technology

March 4, 2014  
Volume 48  
Number 5  
[pubs.acs.org/est](http://pubs.acs.org/est)

Reducing  
Eutrophication  
with Shellfish  
Aquaculture



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**ON THE COVER:** Nutrient overenrichment of coastal waters causes microalgal blooms that existing grazers cannot assimilate leading to hypoxia and environmental degradation. Shellfish aquaculture can restore the assimilative capacity of eutrophic waters, recycle nutrients back into productive uses, and improve habitats. The Feature article in this issue explores the scientific and policy aspects of shellfish aquaculture for nutrient management.

## Comment

### Guest Comment

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ES&T and the IPCC  
Edgar G. Hertwich

[dx.doi.org/10.1021/es500491j](http://dx.doi.org/10.1021/es500491j)

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### A Role for Shellfish Aquaculture in Coastal Nitrogen Management

Julie M. Rose,\* Suzanne B. Bricker, Mark A. Tedesco, and Gary H. Wikfors

Excess nutrients in the coastal environment have been linked to a host of environmental problems, and nitrogen reduction efforts have been a top priority of resource managers for decades. The use of shellfish for coastal nitrogen remediation has been proposed, but formal incorporation into nitrogen management programs is lagging. Including shellfish aquaculture in existing nitrogen management programs makes sense from environmental, economic, and social perspectives, but challenges must be overcome for large-scale implementation to be possible. Excess nutrients in the coastal environment have been linked to a host of environmental problems, and nitrogen reduction efforts have been a top priority of resource managers for decades. The use of shellfish for coastal nitrogen remediation has been proposed, but formal incorporation into nitrogen management programs is lagging. Including shellfish aquaculture in existing nitrogen management programs makes sense from environmental, economic, and social perspectives, but challenges must be overcome for large-scale implementation to be possible.

[dx.doi.org/10.1021/es4041336](http://dx.doi.org/10.1021/es4041336)

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[dx.doi.org/10.1021/es4050665](http://dx.doi.org/10.1021/es4050665)

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2551  [dx.doi.org/10.1021/es4040792](https://doi.org/10.1021/es4040792)

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2561  [dx.doi.org/10.1021/es405222w](https://doi.org/10.1021/es405222w)

**Regional Allocation of Biomass to U.S. Energy Demands under a Portfolio of Policy Scenarios**  
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2579  [dx.doi.org/10.1021/es4034765](https://doi.org/10.1021/es4034765)

**Formation of Brominated Disinfection Byproducts during Chloramination of Drinking Water: New Polar Species and Overall Kinetics**  
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2589  [dx.doi.org/10.1021/es404352h](https://doi.org/10.1021/es404352h)


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2603  [dx.doi.org/10.1021/es404624q](https://doi.org/10.1021/es404624q)


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2635  [dx.doi.org/10.1021/es404861n](https://doi.org/10.1021/es404861n)  
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- 2688  [dx.doi.org/10.1021/es403925g](https://doi.org/10.1021/es403925g)  
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- 2715  [dx.doi.org/10.1021/es404598v](https://doi.org/10.1021/es404598v)  
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- 2741  [dx.doi.org/10.1021/es4047632](https://doi.org/10.1021/es4047632)  
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- 2750  [dx.doi.org/10.1021/es404885e](https://doi.org/10.1021/es404885e)  
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2759  [dx.doi.org/10.1021/es404742c](https://doi.org/10.1021/es404742c)  
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2807  [dx.doi.org/10.1021/es500310t](https://doi.org/10.1021/es500310t)  
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2827  [dx.doi.org/10.1021/es4049412](https://doi.org/10.1021/es4049412)  
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2862  [dx.doi.org/10.1021/es4044209](https://doi.org/10.1021/es4044209)  
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2870  [dx.doi.org/10.1021/es404502x](https://doi.org/10.1021/es404502x)  
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2885  [dx.doi.org/10.1021/es405014g](https://doi.org/10.1021/es405014g)  
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2893  [dx.doi.org/10.1021/es4056388](https://doi.org/10.1021/es4056388)  
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2920  [dx.doi.org/10.1021/es404382s](https://doi.org/10.1021/es404382s)  
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2928  [dx.doi.org/10.1021/es404345b](https://doi.org/10.1021/es404345b)  
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2952  [dx.doi.org/10.1021/es500263x](https://doi.org/10.1021/es500263x)  
**Sediment Contaminated with the Azo Dye Disperse Yellow 7 Alters Cellular Stress- and Androgen-Related Transcription in *Silurana tropicalis* Larvae**  
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2962  [dx.doi.org/10.1021/es404342k](https://doi.org/10.1021/es404342k)  
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2971 [dx.doi.org/10.1021/es404933t](https://doi.org/10.1021/es404933t)  
**Dynamic Selenium Assimilation, Distribution, Efflux, and Maternal Transfer in Japanese Medaka Fed a Diet of Se-enriched Mayflies**  
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2979  [dx.doi.org/10.1021/es4050083](https://doi.org/10.1021/es4050083)

**Prevalence of *Enterococcus* Species and Their Virulence Genes in Fresh Water Prior to and after Storm Events**

J. P. S. Sidhu,\* E. Skelly, L. Hodgers, W. Ahmed, Y. Li, and S. Toze

2989  [dx.doi.org/10.1021/es4050538](https://doi.org/10.1021/es4050538)

**Mercury Exposure Associated with Altered Plasma Thyroid Hormones in the Declining Western Pond Turtle (*Emys marmorata*) from California Mountain Streams**

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2997  [dx.doi.org/10.1021/es405079b](https://doi.org/10.1021/es405079b)

**Concentrations of the Genotoxic Metals, Chromium and Nickel, in Whales, Tar Balls, Oil Slicks, and Released Oil from the Gulf of Mexico in the Immediate Aftermath of the Deepwater Horizon Oil Crisis: Is Genotoxic Metal Exposure Part of the Deepwater Horizon Legacy?**

John Pierce Wise Jr., James T. F. Wise, Catherine F. Wise, Sandra S. Wise, Christy Gianios Jr., Hong Xie, W. Douglas Thompson, Christopher Perkins, Carolyne Falank, and John Pierce Wise Sr.\*

3007  [dx.doi.org/10.1021/es405215v](https://doi.org/10.1021/es405215v)

**Effect of Divalent Metals on Hg(II) Uptake and Methylation by Bacteria**

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3014  [dx.doi.org/10.1021/es405348h](https://doi.org/10.1021/es405348h)

**Increased Waterborne *bla*<sub>NDM-1</sub> Resistance Gene Abundances Associated with Seasonal Human Pilgrimages to the Upper Ganges River**

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**Tradeoffs and Synergies between Biofuel Production and Large Solar Infrastructure in Deserts**

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3031  [dx.doi.org/10.1021/es405792j](https://doi.org/10.1021/es405792j)

**Toward a More Comprehensive Greenhouse Gas Emissions Assessment of Biofuels: The Case of Forest-Based Fischer–Tropsch Diesel Production in Finland**

Sampo Soimakallio\*

3039  [dx.doi.org/10.1021/es403104f](https://doi.org/10.1021/es403104f)


**Experimental Investigation of Homogeneous Charge Compression Ignition Combustion of Biodiesel Fuel with External Mixture Formation in a CI engine**

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3047  [dx.doi.org/10.1021/es4037786](https://doi.org/10.1021/es4037786)  
**Life Cycle Environmental Impact of High-Capacity Lithium Ion Battery with Silicon Nanowires Anode for Electric Vehicles**  
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3056  [dx.doi.org/10.1021/es404636j](https://doi.org/10.1021/es404636j)  
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3065  [dx.doi.org/10.1021/es4045456](https://doi.org/10.1021/es4045456)  
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3074  [dx.doi.org/10.1021/es404859m](https://doi.org/10.1021/es404859m)  
**Chemometrics-Assisted Effect-Directed Analysis of Crude and Refined Oil Using Comprehensive Two-Dimensional Gas Chromatography–Time-of-Flight Mass Spectrometry**  
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3084  [dx.doi.org/10.1021/es404300y](https://doi.org/10.1021/es404300y)  
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3093 [dx.doi.org/10.1021/es500698h](https://doi.org/10.1021/es500698h)  
**Correction to Comparison of Particle Mass and Solid Particle Number (SPN) Emissions from a Heavy-Duty Diesel Vehicle under On-Road Driving Conditions and a Standard Testing Cycle**  
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