

# Da Sulfluramida aos PFOS: o que sabemos e o que ainda precisamos saber.

Juliana Leonel



A Sulfloramida degrada para PFOS?  
Quanto degrada?  
O que acontece com o PFOS no ambiente?

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O quanto importante é  
a Sulfloramida como  
fonte de PFOS?



*Environ. Sci. Technol.* **2004**, 38, 4489–4495

## Perfluorooctanesulfonate and Related Fluorochemicals in Human Blood from Several Countries

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the highest in the samples collected from the United States and Poland (> 30 ng/mL); moderate in Korea, Belgium, Malaysia, Brazil, Italy, and Colombia (3 to 29 ng/mL); and lowest in India (< 3 ng/mL). PFOA was the next most abundant perfluorochemical in blood samples, although the frequency of occurrence of this compound was relatively low. No age- or gender-related differences in the concentrations of PFOS and PFOA were found in serum samples. The degree of association between the concentrations of four perfluorochemicals varied, depending on the origin of the samples. These results suggested the existence of sources with varying levels and compositions of perfluorochemicals, and differences in exposure patterns to these chemicals, in various countries. In addition to the four target fluorochemicals measured,

*Baseline / Marine Pollution Bulletin 56 (2008) 770–797*

# A baseline study of perfluorochemicals in Franciscana dolphin and Subantarctic fur seal from coastal waters of Southern Brazil

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Rosalinda C. Montone<sup>a</sup>

Chemosphere 77 (2009) 863–869



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## Chemosphere

journal homepage: [www.elsevier.com/locate/chemosphere](http://www.elsevier.com/locate/chemosphere)



Specific profiles of perfluorinated compounds in surface and drinking waters and accumulation in mussels, fish, and dolphins from southeastern Brazil

Natalia Quinete<sup>a,b</sup>, Qian Wu<sup>b</sup>, Tao Zhang<sup>b,c</sup>, Se Hun Yun<sup>b</sup>, Isabel Moreira<sup>a</sup>, Kurunthachalam Kannan<sup>b,\*</sup>

*Environ. Sci. Technol.* **2008**, *42*, 5368–5373

## High Accumulation of Perfluorooctane Sulfonate (PFOS) in Marine Tucuxi Dolphins (*Sotalia guianensis*) from the Brazilian Coast

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JOHAN MEYER,<sup>§</sup> LARA G. VIDAL,<sup>‡</sup>  
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number of industrial and household products comprising fire-fighting foams, personal hygiene goods, arthropodicide formulations, and protectors to fabrics, paper, and other surfaces (1). Due to their environmental persistence, bio-accumulative capacity as well as their broad utilization, PFCs have been of great environmental concern since their global distribution was first demonstrated using samples from marine biota (2). The apprehension has been amplified by the observation of biochemical perturbations in wildlife species, under field conditions, as a consequence of exposure to perfluorooctane sulfonate (PFOS) (3, 4).

Despite the awareness of the scientific community about the environmental problem, the only information about PFCs in marine ecosystems from the southern hemisphere concerns measurements in biota from Antarctic and adjacent waters (5, 6), as well as from the southern extreme of the Brazilian littoral (7). There is information from South

and industrial products in Brazil is scanty. However, it is known that PFCs have been used in fire-fighting foams in the country (31). Concerning the perfluoroalkanesulfonates, it is known that the insecticide Sulfluramid (N-ethyl perfluorooctane sulfonamide) is largely used in Brazil for agricultural control of leaf-cutting ants (32, 33) as well as a consumer product marketed for the domestic control of cockroaches and termites. In a mammal organism, this fluorinated insecticide is rapidly metabolized to PFOS (34).



# ENVIRONMENTAL Science & Technology

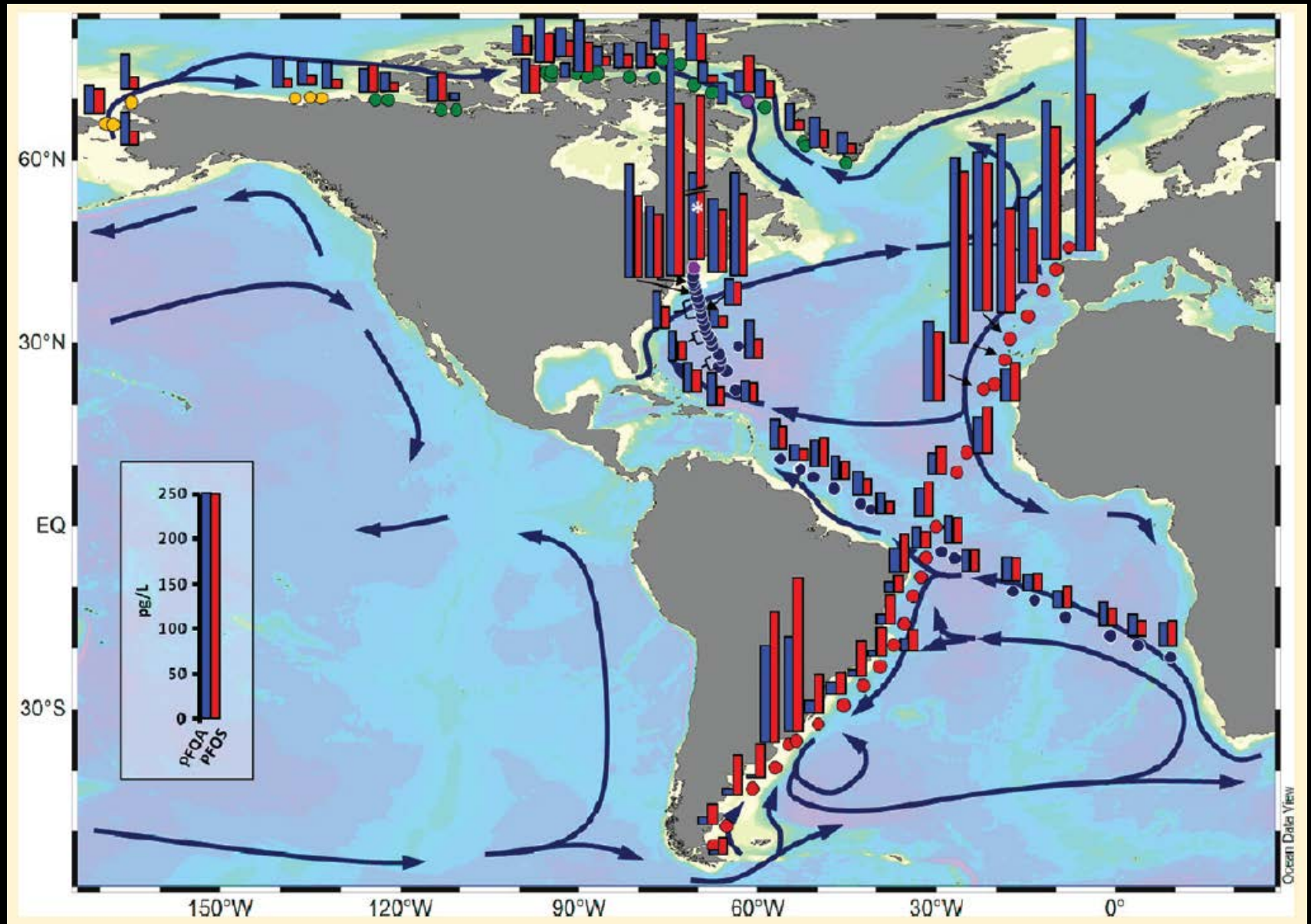
Article

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## Perfluoroalkyl Acids in the Atlantic and Canadian Arctic Oceans

Jonathan P. Benskin,<sup>†,▲</sup> Derek C. G. Muir,<sup>\*,‡</sup> Brian F. Scott,<sup>‡</sup> Christine Spencer,<sup>‡</sup> Amila O. De Silva,<sup>‡</sup>

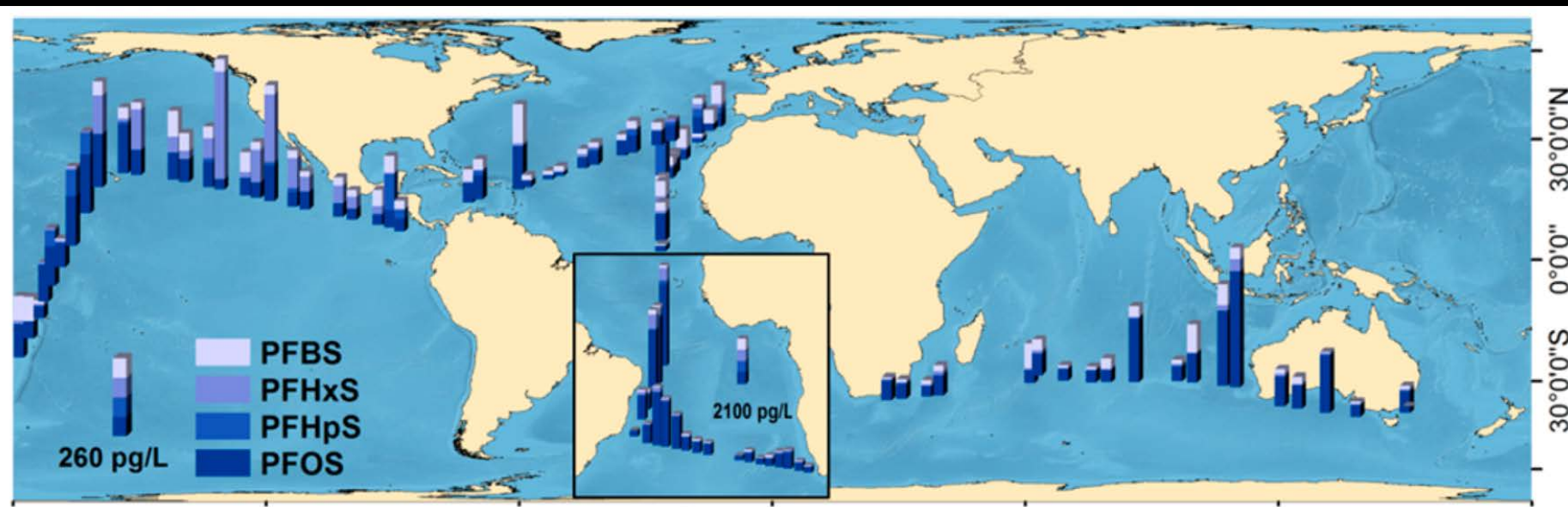


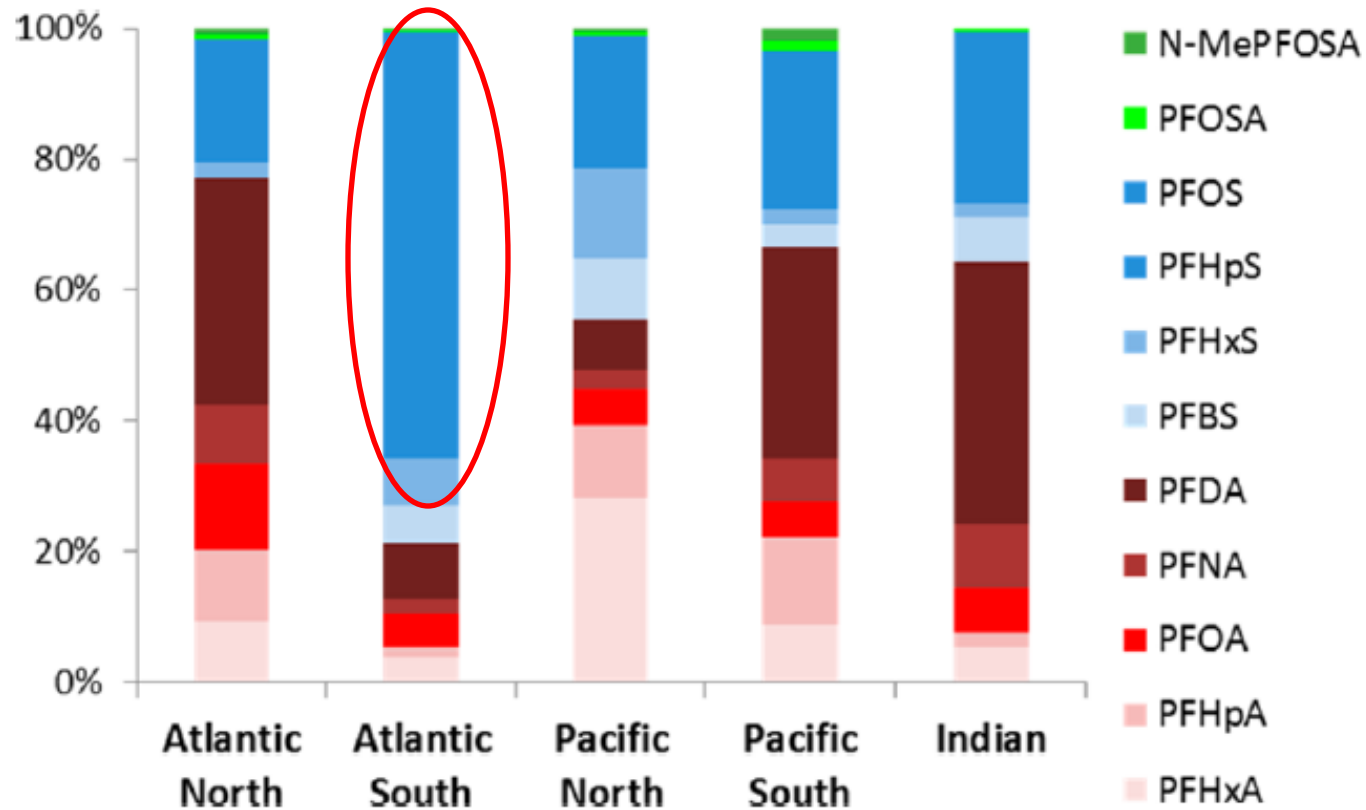




## Perfluoroalkylated Substances in the Global Tropical and Subtropical Surface Oceans

Belén González-Gaya,<sup>†,‡</sup> Jordi Dachs,<sup>‡</sup> Jose L. Roscales,<sup>†</sup> Gemma Caballero,<sup>‡</sup> and Begoña Jiménez\*,<sup>†</sup>





**Figure 2.** Relative contribution of the individual PFASs for each oceanic hemispherical sub basin. Sample sizes correspond to north Atlantic  $n = 25$ , south Atlantic  $n = 22$ , north Pacific  $n = 19$ , south Pacific  $n = 8$ , and Indian Ocean  $n = 18$ .

*Environ. Sci. Technol.* **2009**, *43*, 386–392

## **A First Global Production, Emission, And Environmental Inventory For Perfluorooctane Sulfonate**

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AND ANDREW J. SWEETMAN\*

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Ongoing uses within the European Union in 2004 included; metal plating, photographic, photolithography, and semiconductor industries, hydraulic fluids, and while current stocks last, in perfluorooctane sulfonate (PFOS) based aqueous fire fighting foams (AFFFs) (3–5).

Perfluoroalkyl sulfonates (PFAS) continue to attract scientific, political, and regulatory interest. PFOS and its potential precursors have been classed as emerging chemicals of concern (6) due to their global distribution in biota (7–9) and humans (10). Despite a lack of knowledge about physical–chemical properties, fate, transport, and toxicity,

**3 - 11 pg L<sup>-1</sup> PFOA (amostra)**

**18 - 170 pg L<sup>-1</sup> PFOS (amostra)**

**0 - 15 pg L<sup>-1</sup> PFOA (modelo)**

**~15 pg L<sup>-1</sup> PFOS (modelo)**

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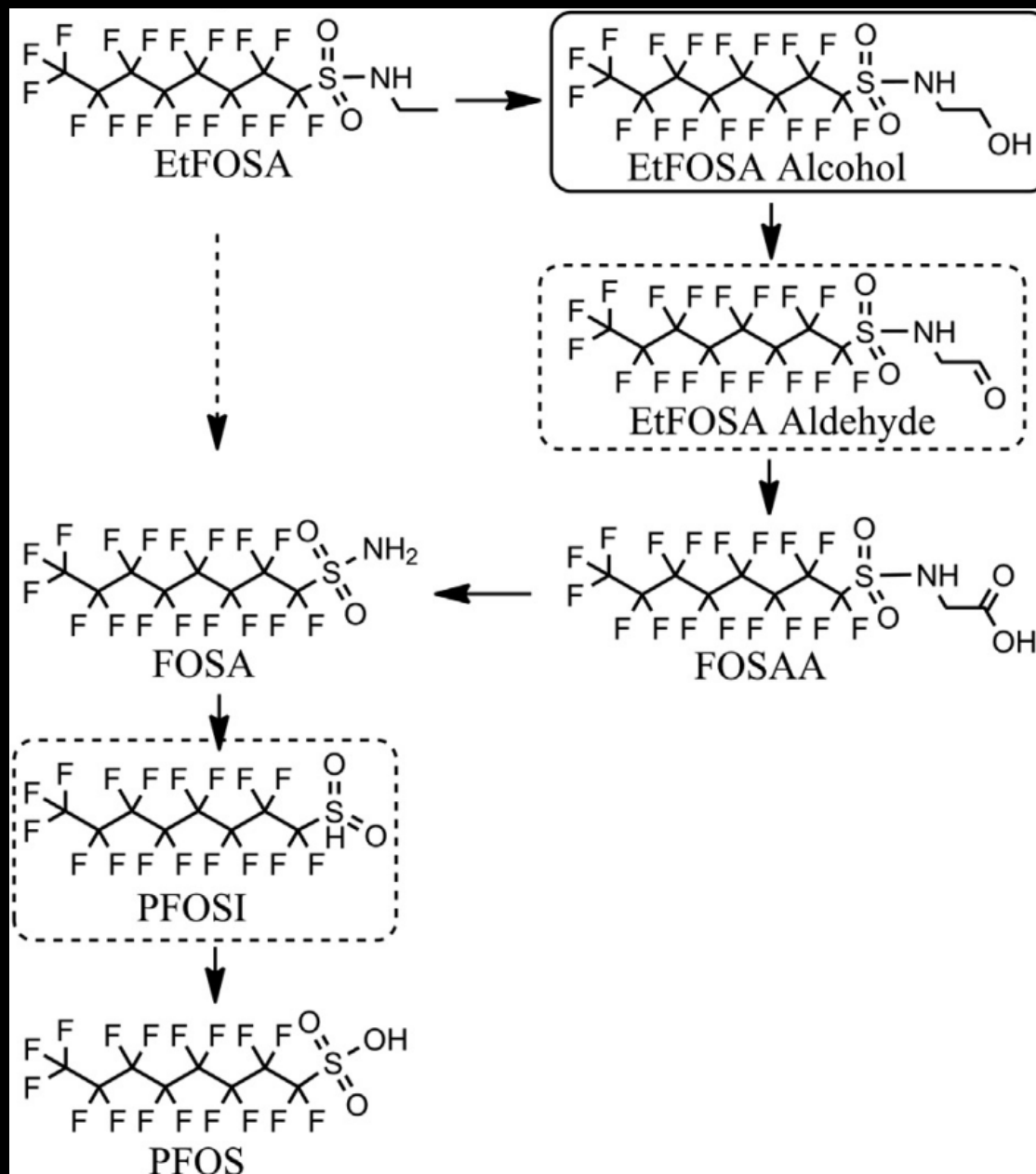
journal homepage: [www.elsevier.com/locate/chemosphere](http://www.elsevier.com/locate/chemosphere)



## Production of PFOS from aerobic soil biotransformation of two perfluoroalkyl sulfonamide derivatives

Sandra Mejia Avendaño<sup>a</sup>, Jinxia Liu<sup>b,\*</sup>







# ENVIRONMENTAL Science & Technology

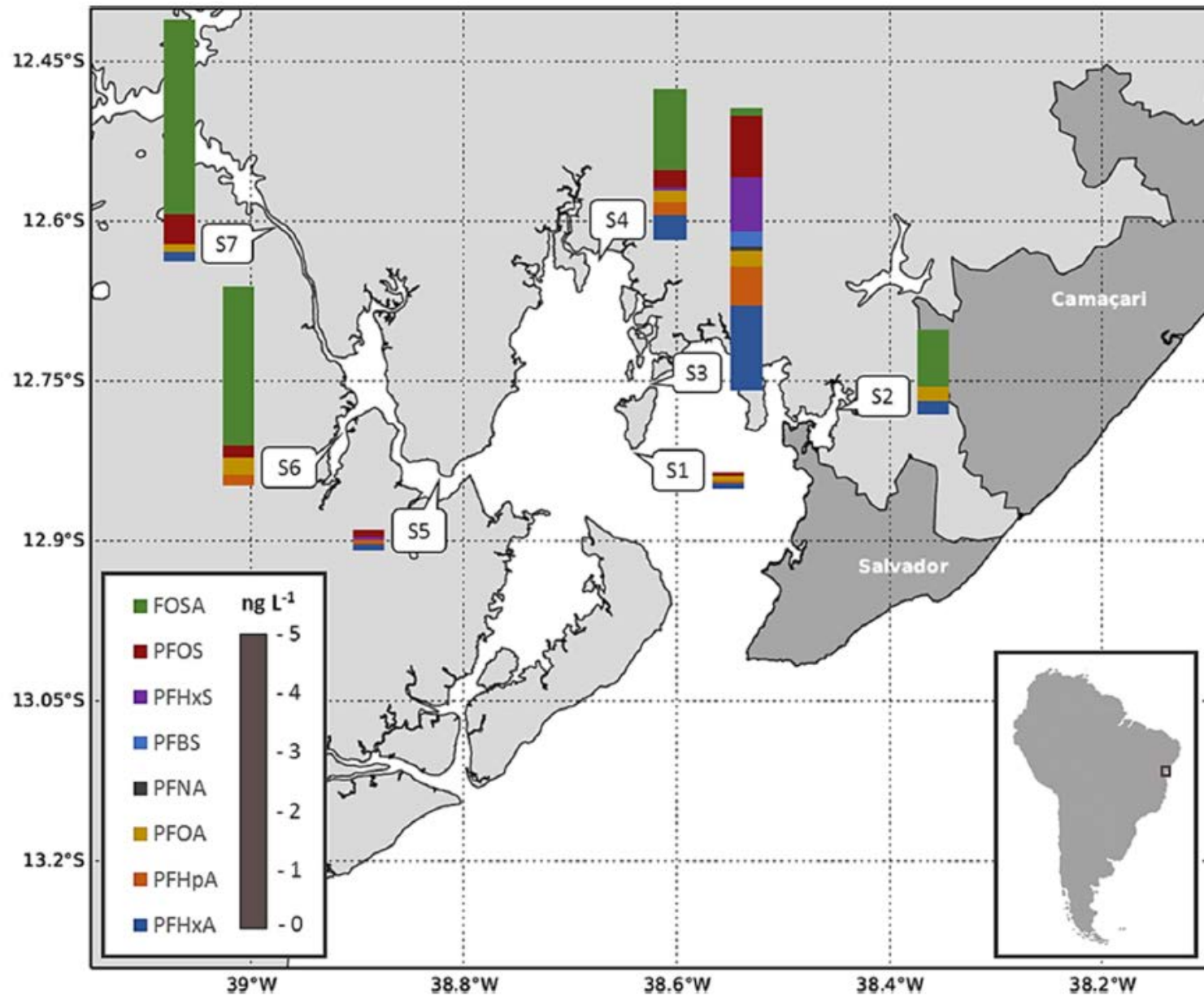
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## Is Ongoing Sulfluramid Use in South America a Significant Source of Perfluorooctanesulfonate (PFOS)? Production Inventories, Environmental Fate, and Local Occurrence

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Quanto degrada?  
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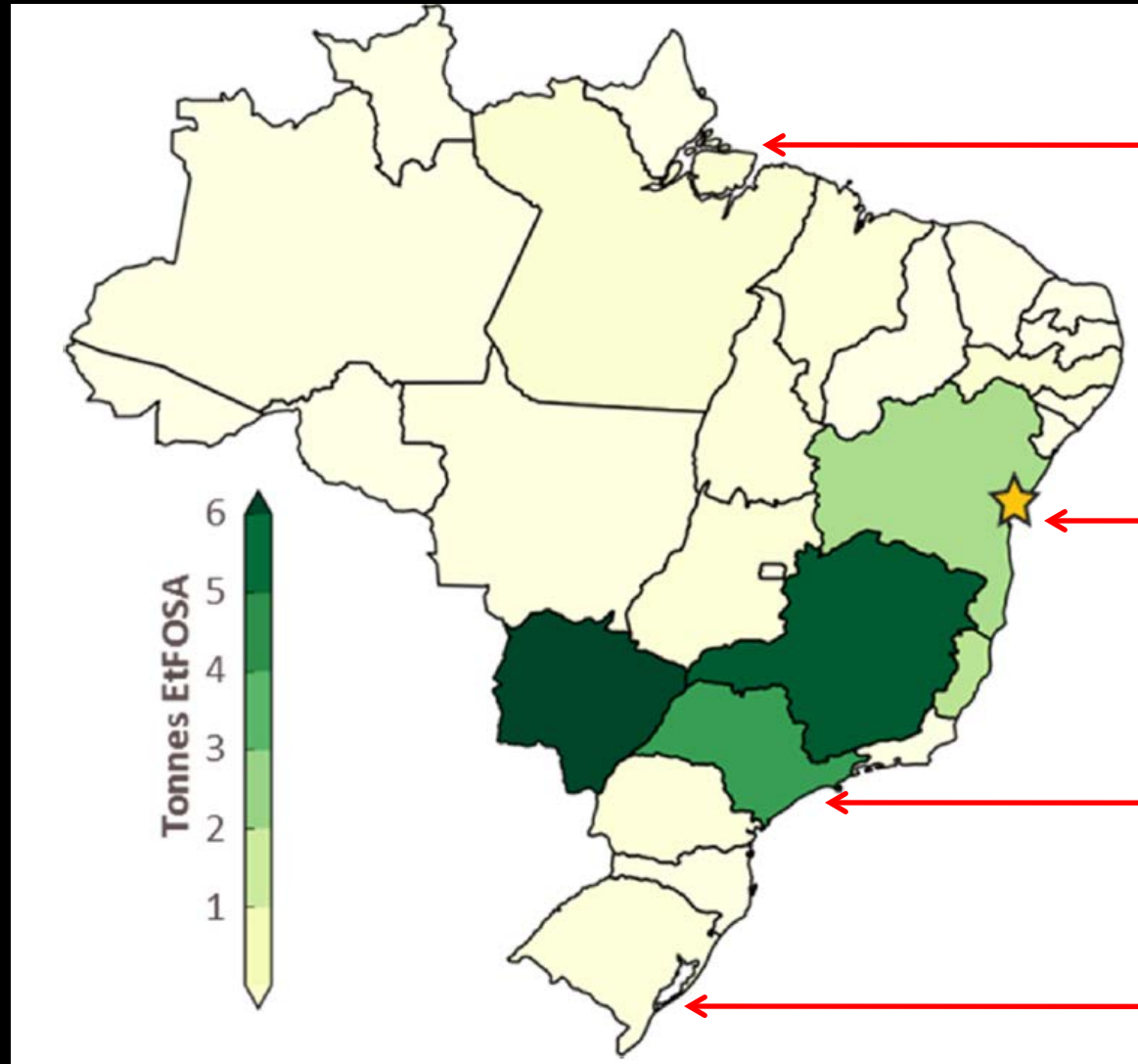
O quanto importante é  
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fonte de PFOS?

1. *Aumento das quantidades usadas/produzidas nos últimos anos (30 t → 50 t, 2006/2007 → 2012).*
2. *Sulfluramida: baixa sorção no solo = baixa mobilidade ambiental → mas, seus produtos de degradação tem alta mobilidade ambiental;*
3. *Taxa de conversão: somente dados de laboratório, necessidade de dados em locais de aplicação;*
4. *Formação de PFOS → presença de microorganismos – “só eles serão capazes de quebrar a ligação S-N”.*
5. *Assimilação dos produtos de degradação pela vegetação.*

# *Transferência de PFAs continente-oceano na costa do extremo Sul da Bahia*



# *Quais os níveis de PFAsAs nas regiões costeiras brasileiras (e Uruguai)?*





# *Degradação da Sulfluramida (puro e produto formulado) em solos com e sem presença de vegetação.*





## Projetos Atuais e Futuros

1. *Transferência de PFAs continente-oceano na costa do extremo Sul da Bahia*
2. *Quais os níveis de PFAs nas regiões costeiras brasileiras (e Uruguai)?*
3. *Degradação da Sulfloramida (puro e produto formulado) em solos com e sem presença de vegetação.*
4. *Perfil de distribuição dos PFAs na chuva.*



	Ingrediente Ativo Kg		Quantidade de PFOSF Kg (IA x 1,6)	
	2011	2012	2011	2012
Importação	823	1.265	1.317	2.024
Produção	35.120	30.470	56.192	48.752
Vendas	30.730	33.290	49.168	53.264
Exportação Empresas	1.000	1.200	1.600	1.920
Exportação Aliceweb	2.063	2.183	3.301	3.493
Total ((Imp. + Prod.) – Exp.)			54.208	47.283
Quantidade Média	50.745			



*Muito obrigada pela atenção!*