Water is a fundamental human right, but it is also a $450 billion global industry growing at 2 to 3x GDP. From Wall Street to rural Sub-Saharan Africa, technology innovation to aging infrastructure – this course will explore the impact of water and consider what future leaders need to know about the dynamics of the industry, investment and business opportunities, and water-related risk.

Opportunities for water are booming around the world, in large part because of existing or looming shortages and decades of underinvestment, population growth, rapid industrialization and urbanization, pollution, and climate change. Water is the only irreplaceable natural resource on the planet. Its critical role in every aspect of the global economy, could, in fact, lead it to be the next gold or the next oil.

The course:
This course will address the fundamentals of the business of water. The future of water will be critical to our global economic, social and political development and will likely become one of the most influential factors in business decisions of the future. Furthermore, it is fundamental for leaders across all sectors – from pharmaceuticals to financials, energy to agriculture – to understand how to sustainably manage and account for water resources, capitalize on new technologies, mitigate water-related risks and navigate through complex and dynamic policy and regulation. The course will engage students in high level discussion and strategy formation, challenging them to develop creative and sustainable solutions to some of the greatest challenges facing business and water industry leaders today. Interactive sessions and projects will provide an introduction to appropriately managing, valuing and investing in water assets to create compelling business opportunities.
# Lecture Schedule

**ENVS 673 660  Fall 2018**  
Mon 5:30pm  
*(Lecture schedule subject to change)*

<table>
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<th>Date</th>
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| Sept 10 | Class outline  
Overview of the global water industry                                   |
| Sept 17 | Water policy and governance  
Economics of water                                                            |
| Sept 24 | Water CSR and Stewardship Initiatives – Part 1                          |
| Oct 1   | Water CSR and Stewardship Initiatives – Part 2 / Water risk and water footprinting overview |
| Oct 8   | Water risk and water footprinting tools                                 |
| Oct 15  | Case Study: How water policy, economics & risk play out in Saudi Arabia vs. Brazil vs. California |
| Oct 22  | Water reuse: An in-depth look  
Water treatment technology: Development, deployment and management           |
| October 29 | **Opinion Papers Due. No class (field trip on Nov 2 replaces Oct 29 class)**  
Electronic submission by 10pm.                                               |
| *Nov 2  | A day in the life of a water industry lobbyist – (Field trip to Washington DC on Friday, November 2 to replace Oct 29 class) |
| Nov 5   | Global water infrastructure development                                  |
| Nov 12  | Investing in Water – Part 1  
Early-stage water investment, institutional investment and corporate activity |
| Nov 19  | Investing in Water – Part 2  
Public-Private Partnerships in Water                                        |
| Nov 26  | The Water-Energy Nexus                                                   |
| Dec 3   | Final presentations                                                      |
| Dec 10  | Final presentations                                                      |
The Future of Water
Course Details
ENVS 673 660  Fall 2018
Mon 5:30pm

Class Format  Lecture, case studies, class discussion, group project and presentation, guest speakers

Course Grading

- Group project and presentation— 45%
- Opinion Paper – 25%
- Class participation – 30%

Group project and presentation (45%)

Select a distinct challenge or pain point for a company, municipality or other entity. This can be in infrastructure provision, regulation, knowledge, technology, public-private sector collaboration, investment, community engagement, risk, or any other area. Develop a business model to best resolve the challenge, addressing issues such as funding, management, risk, policy, regulation and sustainability, etc. Account for direct and indirect risks, costs and environmental impacts. Address the sustainability of the solution as well as areas of potential challenge or conflict. Speak to how you would turn your proposed model into a real-life solution – taking it from the classroom to the boardroom.

We will discuss the project, resources and grading criteria in greater detail in the first session.

Short written assignment (25%)

Opinion Paper – The course will include one brief write-up on a choice of three topics introduced in the course discussion. The short opinion paper (800-1200 words) is meant to challenge you on fundamental aspects of the water industry and the environmental, social, economic and dimensions of the industry. In the write-up, you should be able to defend a strong point of view (in favor or against), and use facts and analytical frameworks to support your argument.

Participation (30%)

Participation includes contributing to class discussions and small group exercises, making presentations in class, sharing relevant news items, and participating in team projects. The expectation will be that all readings and assignments are completed in advance of the class for which they are assigned.

Office Hours  By appointment
The Future of Water
Course Details
ENVS 673 660  Fall 2018
Mon 5:30pm

Reading
Specific readings will be assigned in advance of each class

Recommended reading for general background

- Drinking Water: A History, James Saltzman
- Blue Revolution: Unmaking America's Water Crisis, Cynthia Barnett
- Unquenchable: America's Water Crisis and What To Do About It, Robert Glennon

Additional resources

- The Ripple Effect: The Fate of Fresh Water in the Twenty-First Century, Alex Prud'homme
- The Future of Water, Steve Maxwell
- Blue Gold: The Fight to Stop the Corporate Theft of the World's Water, Maude Barlow, Tony Clarke
- The Big Thirst: The Secret Life and Turbulent Future of Water, Charles Fishman
- Determining the Economic Value of Water: Concepts and Methods, Robert A. Young
- Cadillac Desert: The American West and Its Disappearing Water, Revised Edition, Marc Reisner
- Water: The Epic Struggle for Wealth, Power, and Civilization, Steven Solomon
- Bottled and Sold: The Story Behind Our Obsession with Bottled Water, Peter H. Gleick
- The Nile River Basin: Water, Agriculture, Governance and Livelihoods, Seleshi Bekele Awulachew, Vladimir Smahktin, David Molden and Don Peden
About the Professors
Jon Freedman and Francesca McCann

Jon Freedman, Senior Vice President, Global Government Affairs at SUEZ - Water Technologies & Solutions

Jon Freedman leads Global Government Affairs & Policy for the multi-billion dollar Suez Water Technologies & Solutions. Before taking on the government affairs roles, he was a director in GE’s Corporate Marketing Initiatives Group, where he reported to GE’s Chief Marketing Officer and he helped lead the creation of GE’s global environmental sustainability initiative called Ecomagination.

Freedman originally joined GE as a Global Business Development Leader with GE Energy, where he helped GE create a global water business by initiating and leading acquisitions of NYSE-listed companies. He initiated what turned out to be three of the five acquisitions that GE made over a several year period to create what today is one of the world’s leading advanced water treatment companies with more than 8,000 employees in 130 countries around the world.

Before joining GE, Mr. Freedman worked in various senior leadership roles for Suez Water, both in the United States and in Paris, France. His roles included Vice President & General Counsel for Suez Water’s U.S. real estate business unit, and Director of Business Development for the Western U.S. Mr. Freedman earned a BA from the University of Virginia, a JD from William & Mary Law School, and an MBA in Finance from The Wharton School of the University of Pennsylvania.

Francesca McCann, Business Development Director, infraManagement Group (a Black & Veatch Company)

Ms. McCann has been at the forefront of water strategy, project development and investment for over a decade. Ms. McCann currently serves as the Business Development Director for infraManagement Group (iMG), a wholly-owned subsidiary of Black & Veatch. In 2008, Ms. McCann founded Global Water Strategies, an investment, strategy and policy advisory firm for corporate water strategy, water investments, public-private partnerships (PPPs), water reuse and the energy-water nexus. Prior to founding Global Water Strategies, Ms. McCann covered the water sector for Wall Street for seven years, where she built a niche research product for institutional investors.

Ms. McCann served as CEO of Abengoa Water USA, where she led the team to the successful contracting of the Vista Ridge Project in San Antonio, TX. The $3.4 billion Project is the first of its kind, large-scale water supply public-private partnership in the U.S. and will supply 50,000 acft/year of water to the City of San Antonio over a 30-year period.

Ms. McCann has been featured in print and on television including the New York Times, Business Week, Barron’s, Bloomberg and MSNBC. She frequently speaks at prominent water conferences in the U.S. and abroad. She has also been published in numerous industry journals and is regularly cited in trade publications for her analysis of the environmental and water industries.

Ms. McCann speaks four languages and has lived in Asia, Latin America, and Europe. Her professional career includes a Political Appointment at the U.S. Department of Energy and Latin American trade policy at the U.S. Chamber of Commerce. She holds a BA in International Political Economy from Colorado College and an MBA from the UCLA Anderson School with a concentration in International Management and Finance.

Francesca McCann/Jon Freedman – ENVS 673 660 – Fall 2018