

UF/IFAS Soil and Water Sciences Department Invited Speaker Seminar

Speaker: **Dr. Fernando Jaramillo**
Stockholm University, Sweden
Department of Physical Geography,
and Stockholm Resilience Center

Title: **Human Impacts on the Terrestrial
Freshwater System**

Date: Monday, January 30, 2017

Time: 3:00 pm – 4:00 pm

Location: McCarty Hall A, Room G186



Human consumption of freshwater has dramatically increased throughout the last century. Concerns over the levels of current consumption have triggered the development of assessments of global and regional freshwater consumption used in important policy-focused reports on water resources. Their results have been used to assess up to what point humanity has affected the hydrological cycle, and if such affects threaten the survival of humans on earth. However, some types of water consumption are difficult to measure; consumption is not only from water resources such as aquifers, lakes or rivers (blue water), but also from rainwater in the form of soil moisture and later used by plants (green water), primarily in agriculture. In addition, any human change in land cover results in consumption of freshwater.

Here I address this problem by attempting to estimate freshwater consumption (both blue and green) from the most relevant human activities, and use them to do a global quantification. I apply a methodology to separate the change-effects of climate and humans activities on the water cycle in several basins around the world. I show how just irrigation and flow regulation by dams have increased during the past century the long-term average human consumption of fresh water by $3563 \pm 979 \text{ km}^3/\text{yr}$; increase that suggests a breaching of the planetary boundary of freshwater describing a safe space for humanity. This increase also raises the former human water footprint by at least 20%, to more unsustainable levels. I compare these quantifications of evapotranspiration change due to dams and irrigation with that of other human activities and climatic drivers to conclude that human are changing the water cycle in unprecedented ways.

For our off-campus students, off-campus faculty, and on-campus students who cannot attend, this seminar can be viewed via live or watched at a later date via this link: [Dr. Fernando Jaramillo](#). In addition, all seminars are archived for viewing on our [SWSD Seminar Page](#).