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### Thomas Ballestero, Director, UNH Stormwater Center (CEPS) travel to Brazil

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UNH Global

# Thomas Ballestero

Director, UNH Stormwater Center (CEPS) ~ Brazil



Prof. Thomas Ballestero leading a class lecture in Brazil

Last spring I was invited by the Department of Hydraulic and Environmental Engineering (DEHA) to teach a stormwater course at the Federal University of Ceará (UFC) in the city of Fortaleza for professionals from throughout Brazil. 36 students from eight different Brazilian states attended. Stormwater management in Brazil is particularly acute as Fortaleza is located in the arid northeast of Brazil. In addition, Fortaleza, the state capital

with population of 2.6 million, witnessed the extensive urbanization of all other modern cities. This urbanization exhibits significant amounts of impervious surfaces across the landscape (rooftops, sidewalks, roads, driveways, etc.). Unmanaged, the pollutants and water from these surfaces can impair receiving waters and flood streets. This one week course taught modern green infrastructure system designs.

The course was supervised by my former graduate advisee Marco Aurelio Holanda de Castro (MS, 1990). Dr. Castro will be at UNH fall 2019 teaching some of the computer modeling techniques he has developed for drainage and hydraulics. Other professors and former advisees also presently at UFC DEHA who were able to collaborate with this course included: Ernesto da Silva Pitombeira (PhD 1993) and Francisco Osny Eneas da Silva (2008). The last mentioned student was the first of my

“sandwich” PhDs from Brazil. Each year, over one thousand Brazilian PhD students are funded to perform their PhD research in other countries. This funding comes from the Brazilian equivalent to the National Science Foundation called CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior).

The “sandwich” moniker stems from the fact that the students first perform their coursework in Brazil, then execute their research in another country, then defend their dissertation: the international research is sandwiched between the Brazilian efforts. As a result of my stormwater short course, this academic year I am hosting Ms. Amanda Silva e Vieira who is researching water flow in fractured rock systems. Dr. Majid Ghayoomi in the Civil and Environmental Engineering Department is also supervising her efforts.

Another result of my short course was my ability to interact with other Brazilian

universities, students, and professors. At the moment I am on thesis/dissertation committees for students in the states of Ceará, São Paulo, and Santa Catarina; all were student from my short course. This has also led to additional invitations from those universities.

There have been numerous UNH – UFC exchanges over the past four decades in virtually all colleges. I am grateful to the UNH Global Education Center Faculty International Development Grant to be able to continue this exchange.



Overflowing storm sewer in Fortaleza on the way to class

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