Wave Dispersion Technologies
Jonathan Smith

Jonathan Smith and his father, Dennis, motivated by the need for erosion protection for an oceanfront condominium development in New Jersey embarked on what would become Wave Dispersion Technologies (WDT). Their erosion prevention product is a modular and highly engineered marine floating breakwater system shown in Figure 1.

Figure 1. Floating Breakwater System (left) Consisting of an Array of Modules (right)

In addition to erosion protection, WDT has developed another market for their system – namely as a line of demarcation for security purposes.

This case study is ripe for deeper exploration along a variety of dimensions; for our purposes we chose to focus on the technical aspects of their use of scale model testing to optimize the module geometry and array layout for maximum effectiveness. As such, the case has been embedded into our undergraduate Fluid Mechanics course. The case study is presented after the students have had the lecture on non-dimensional analysis, and, as part of the case study delivery, the students are engaged in an exercise where they are asked how they would proceed to setup appropriate scale model tests/non-dimensional parameters for this situation.

A rough content outline of the case is provided below:

- Video: Jonathan Smith defines entrepreneurship and traits of an entrepreneur
- Video: Jonathan Smith explains what distinguishes technical entrepreneurship
- Tech transfer cycle
- More about an entrepreneur from Jonathan Smith and NCIIA/KEEN
- Video: Jonathan Smith explains how beach erosion problem represented a business opportunity
- Review of existing breakwater solutions
- Video: Jonathan Smith discusses the finances of establishing WDT
- Image showing array of modules comprising a waterbreak
- Video: Jonathan Smith explains how WDT got into security barriers
- Video: Jonathan Smith discusses some of the non-technical challenges in creating and marketing their products
- Role of scale model testing in developing the product, including some images of the full size and ¼ scale models
- In-class exercise: The fluids instructor leads the class in a live exercise asking the students to setup the appropriate non-dimensional analysis terms for the scale model testing
- Video: Jonathan Smith discusses exit strategy for WDT

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