CMS/C2SHORE MODEL COMPARISON TO LABORATORY DATA
CMS

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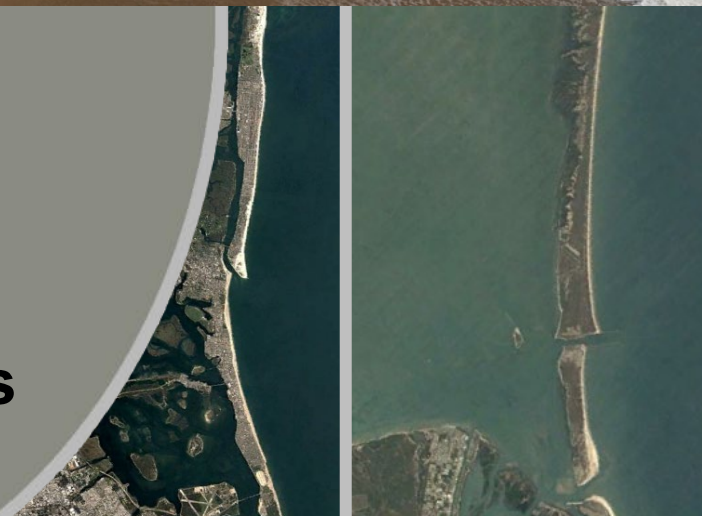
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BLUF

- To develop reliable predictive numerical modeling technology with skill and generality.
- A first-principles model is unlikely, so closures are dependent on high-quality data to bolster empirical devices.
- FRF data provides some model/data comparisons, but detailed sediment data are unavailable.

FRF Transect, y = 860

Legend:
- 06-Sep-2017 00:15:00
- 12-Oct-2017 00:15:00
- CSHORE V2014
- CSHORE V2019

$$a' = a(1 - \frac{S}{\phi})$$

$$D' = \frac{D}{h} A e^{\frac{\alpha h}{H_{rms}}}$$

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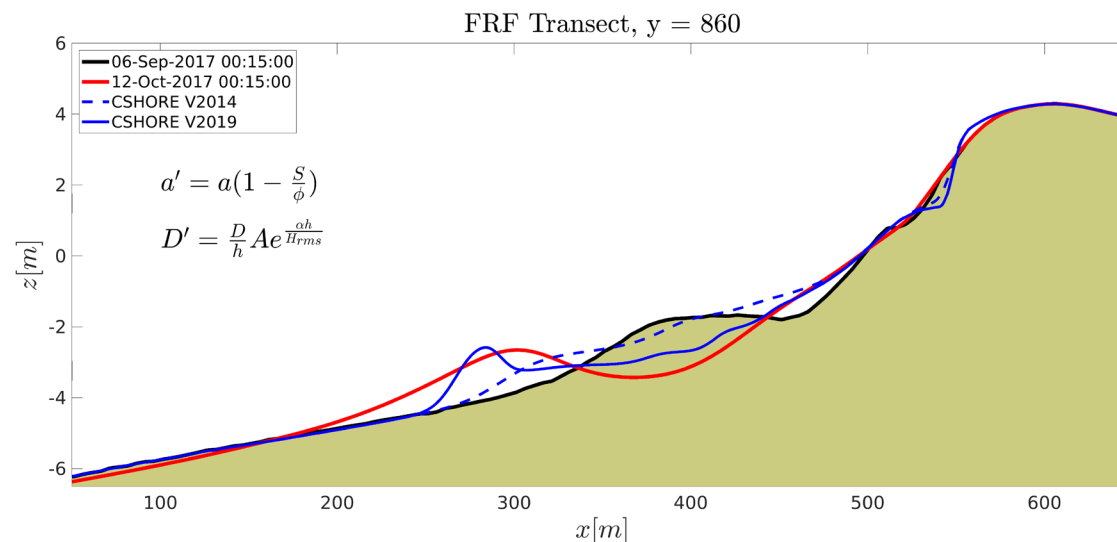
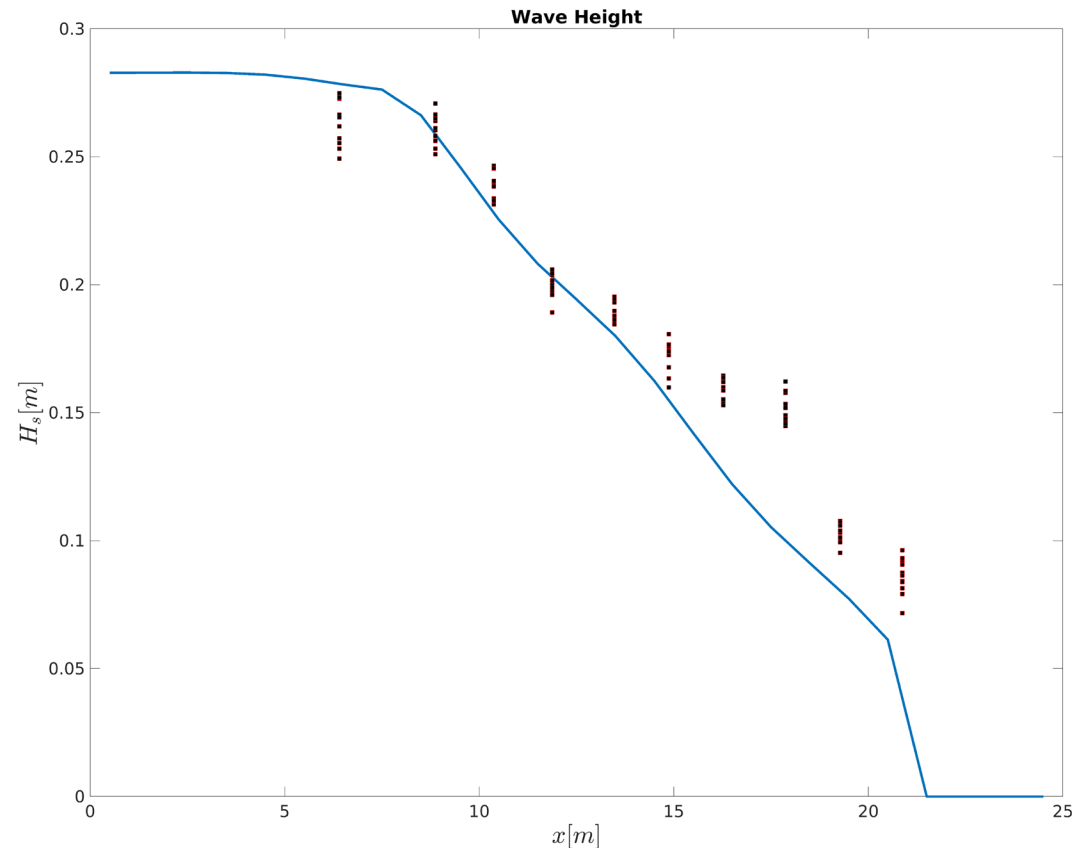# FY19 research: CMS model applied to LSTF

- Waves
- Currents, cross- and longshore
- Longshore sediment transport
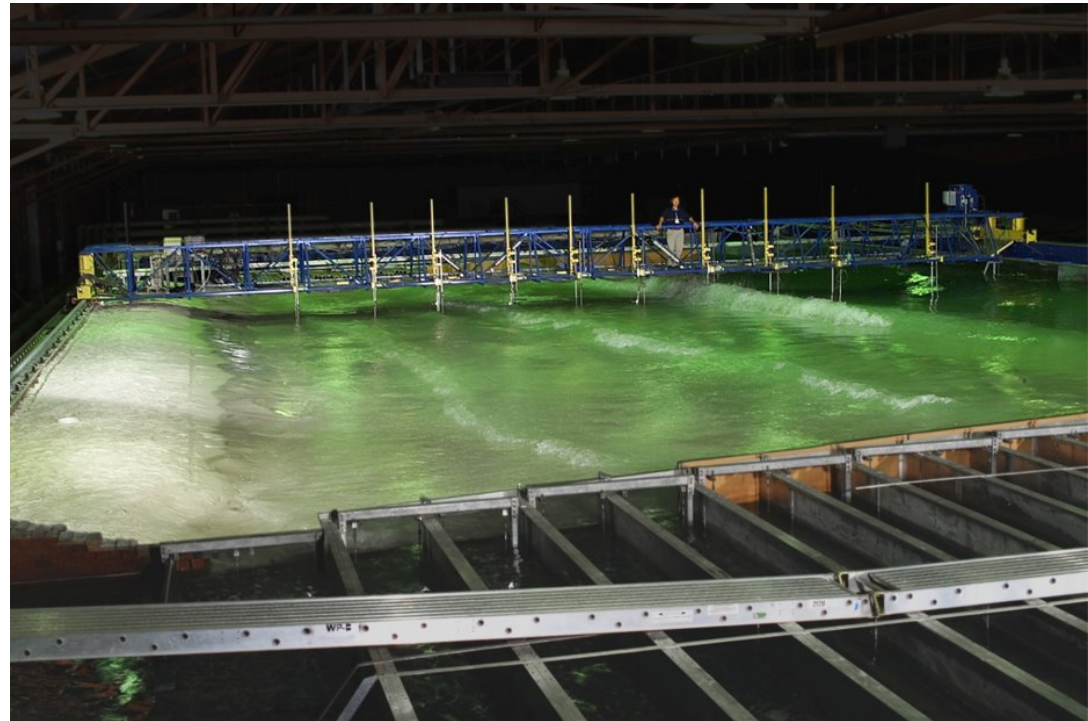
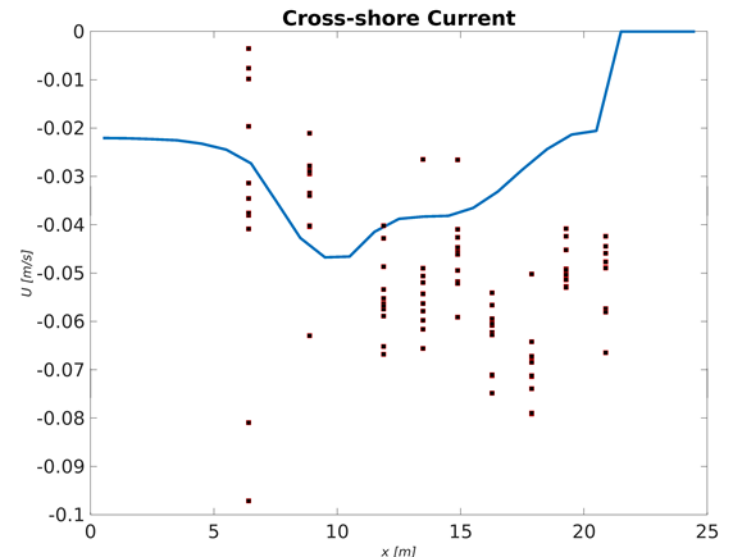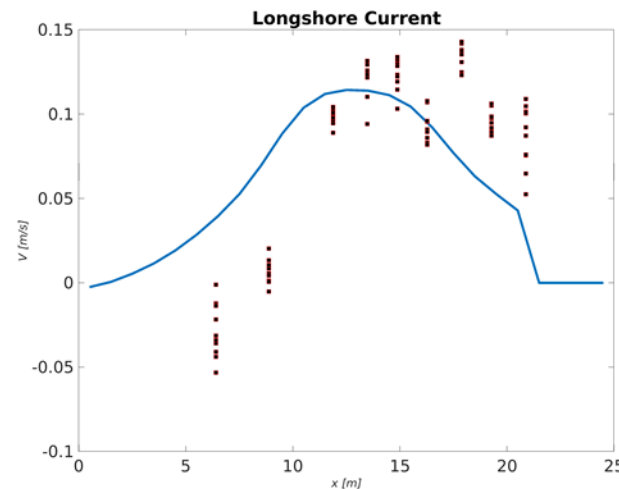# FY19 research: CMS model applied to LSTF

- Roller model improves model
- CMS wave model doesn't permit tuning
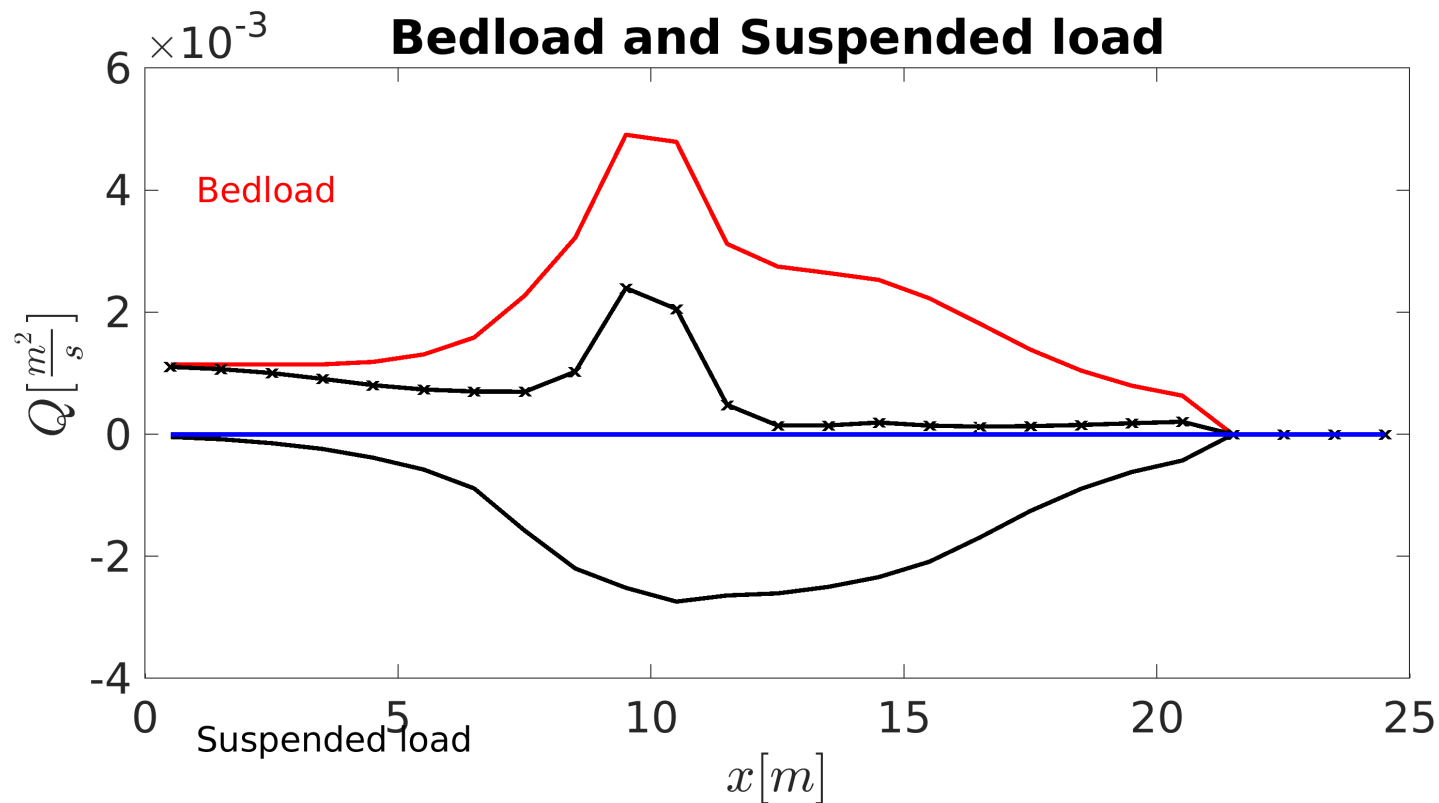
FY19 research: CMS model applied to LSTF

- No recirculation in CMS
- V data is larger for inner surf
- U data/model within a factor of two

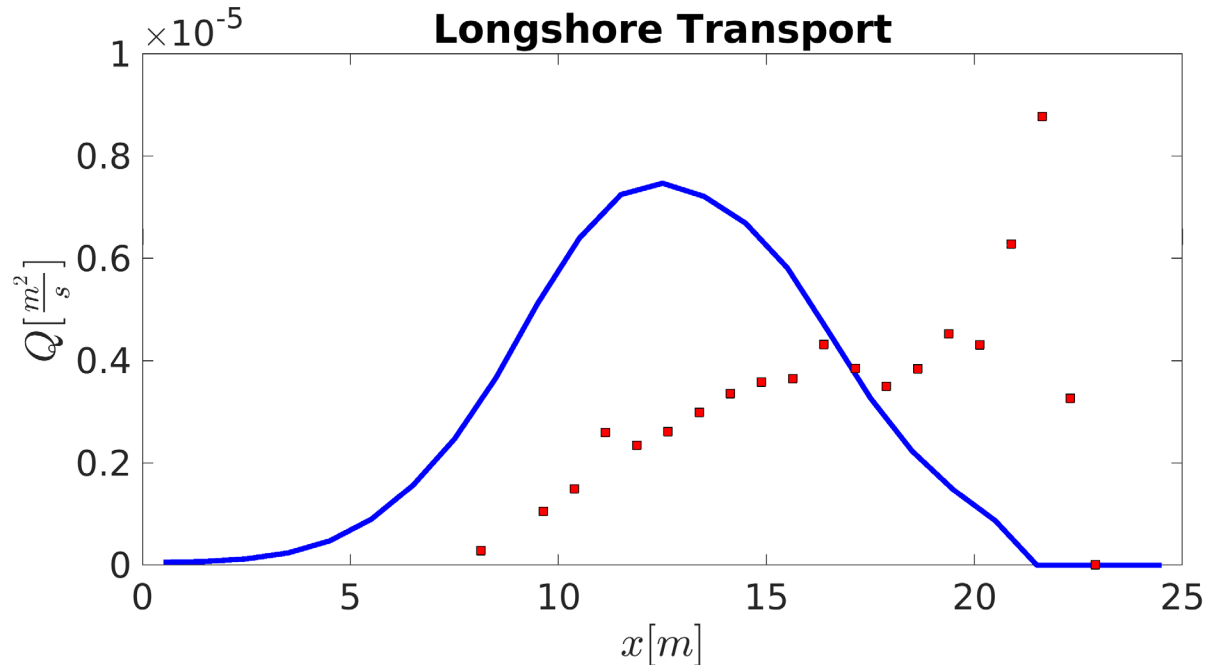# FY19 research: CMS model applied to LSTF

- C2SHORE is predicated on energy dissipation suspending sand

FY19 research: CMS model applied to LSTF

- Longshore transport predictions have correct magnitude
- Swash transport not included in model
- Cross-shore distribution suffers from miscalculations in dissipation and longshore currents
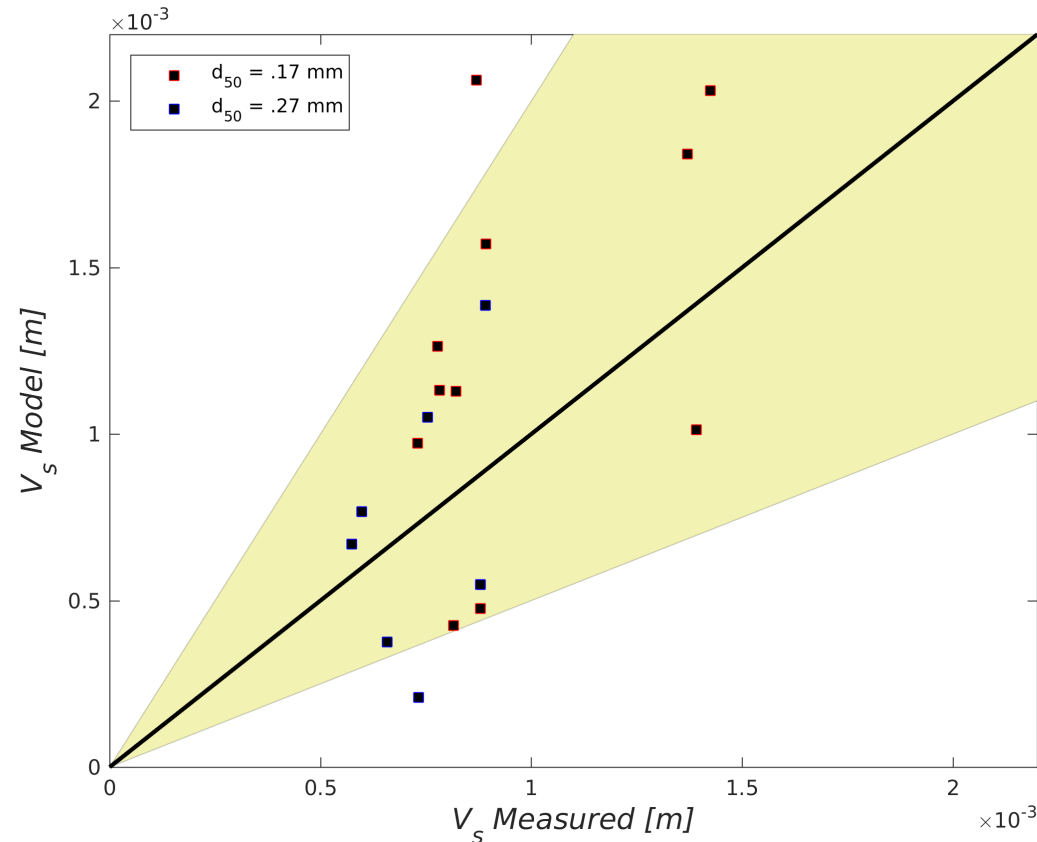
Longshore Transport

$Q\left[\frac{m^2}{s}\right]$ vs $x[m]$, $\times 10^{-5}$

FY19 research: CMS model applied to OSU

- Fixed bed except on bar
- Detailed sediment data with two grain sizes
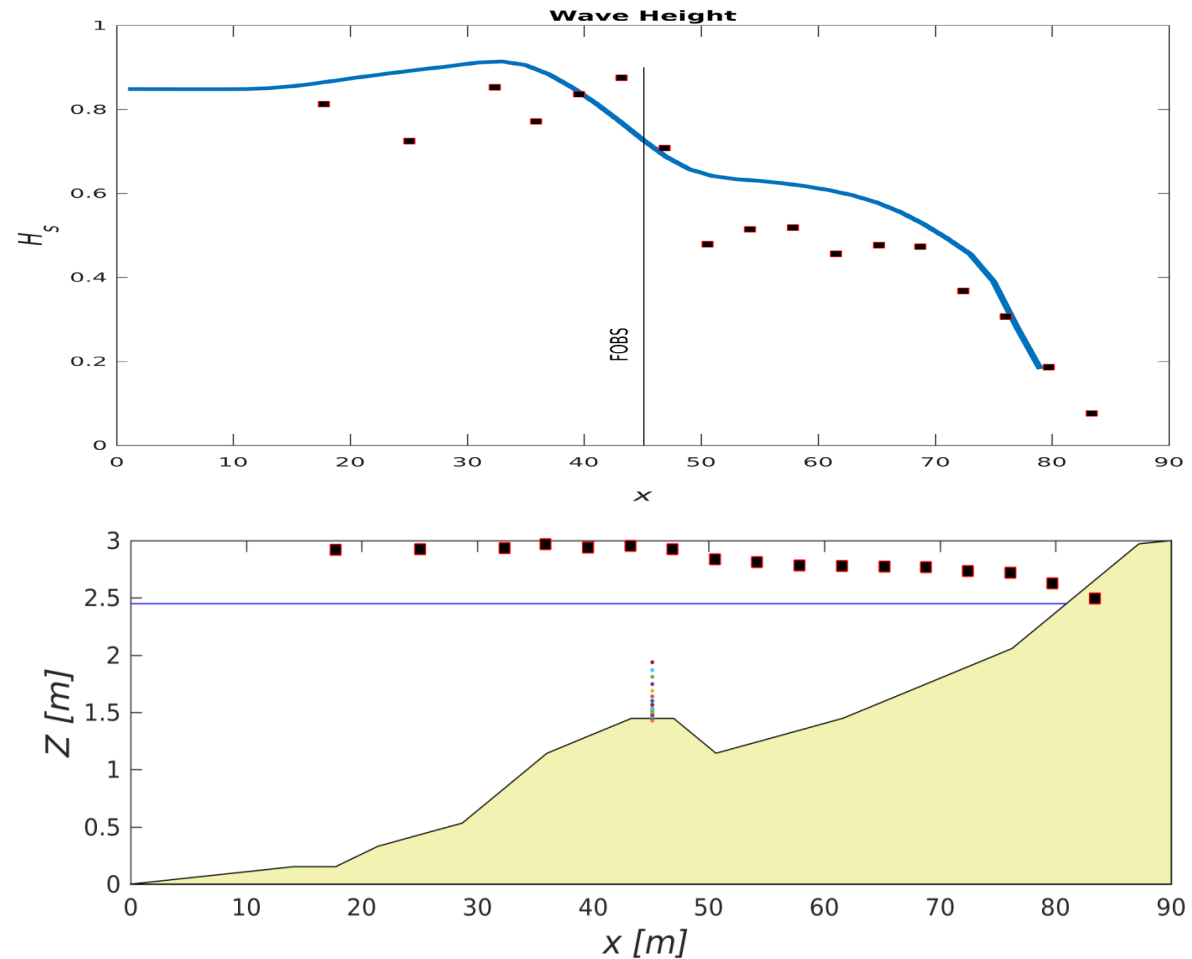
FY19 research: CMS model applied to OSU

- Data isolates the wave-driven mode
- The empirical paramter is ~3 times larger than expected.

Summary

FY19

- **Comprehensive lab/model comparisons including wave/currents/sediment concentration/transport**
- **Development of new CSHORE algorithm on basis of field and laboratory data.**

FY20

- **Including swash transport in CMS**
- **Incorporate grain size gradation in CMS/C2SHORE**