

Array Geometry Optimization

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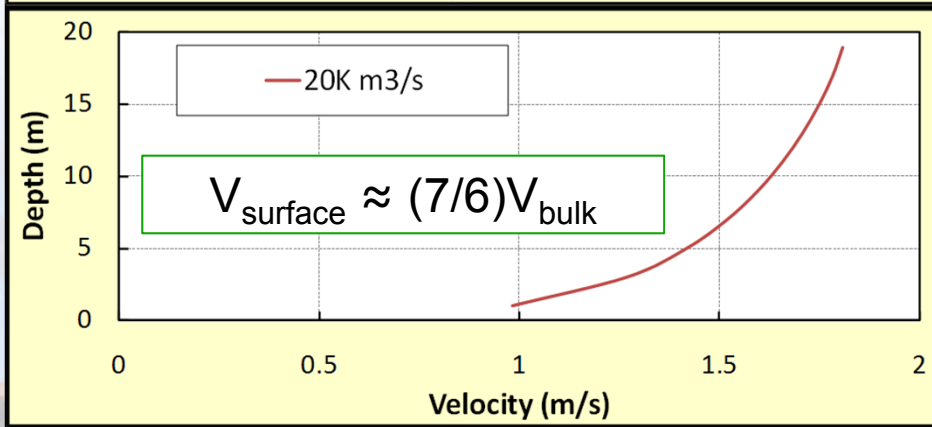
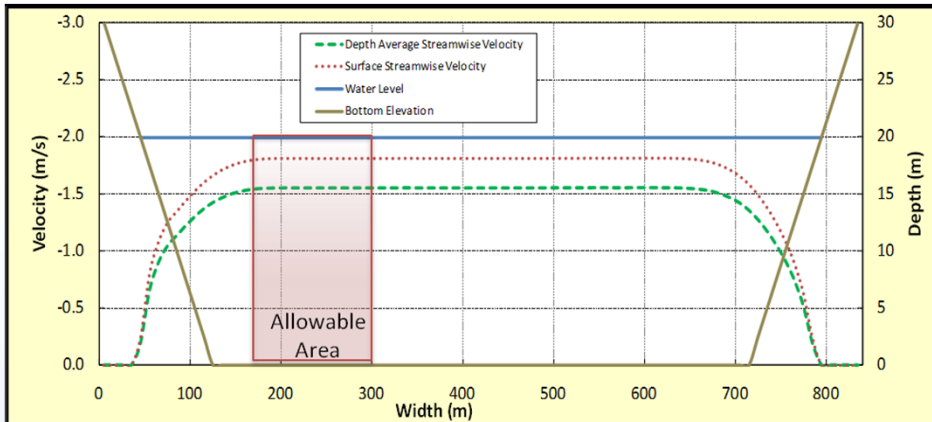


Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

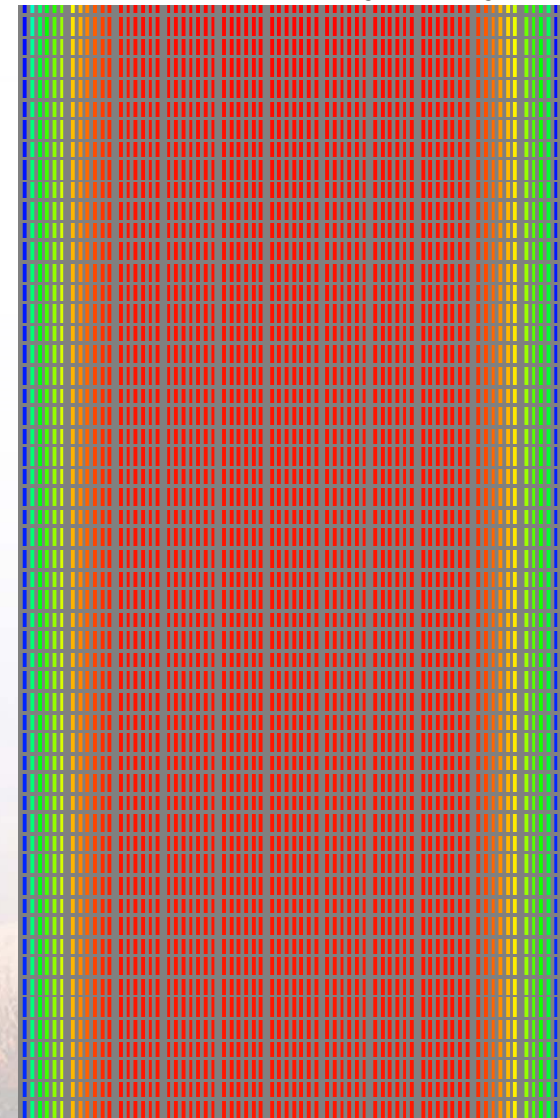
EFDC Model Domain

Model Conditions

- Constant flow = 20,000 m³/s
- $U_{\infty} \approx 1.6$ m/s
- Top width is ≈ 750 m
- Max depth is ≈ 20 m



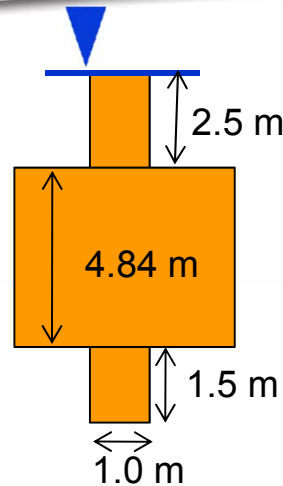
Channel Bathymetry



Array Scenarios

{ $Q = 20,000 \text{ m}^3/\text{s}$ }

■ = One 6.45-m-diameter VAHT
"floating" from water surface



Flows

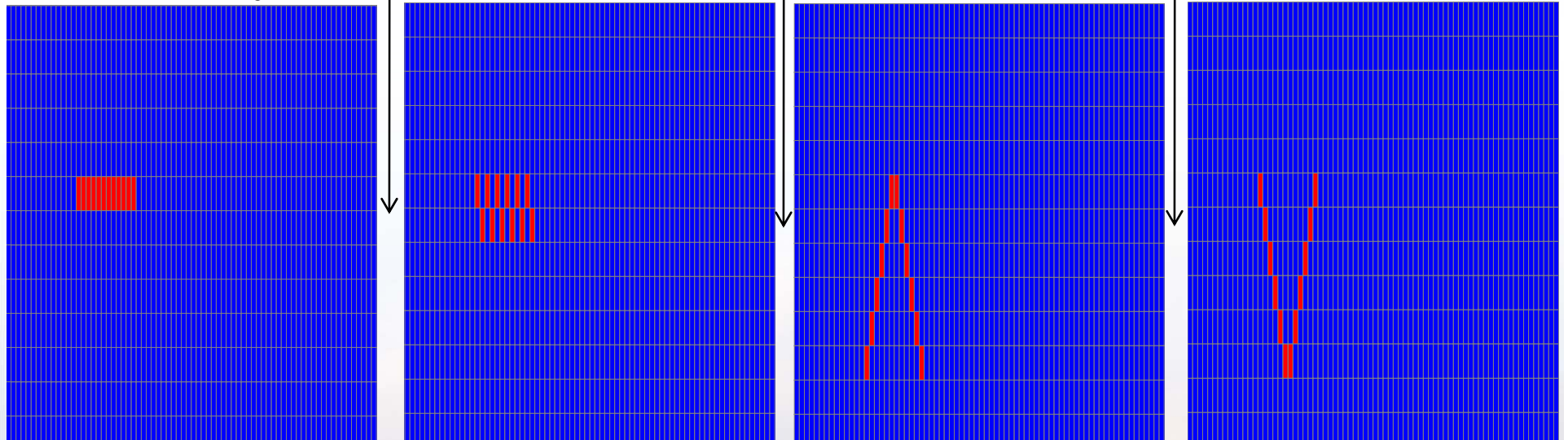
Line array

Checker array

Λ array

V array

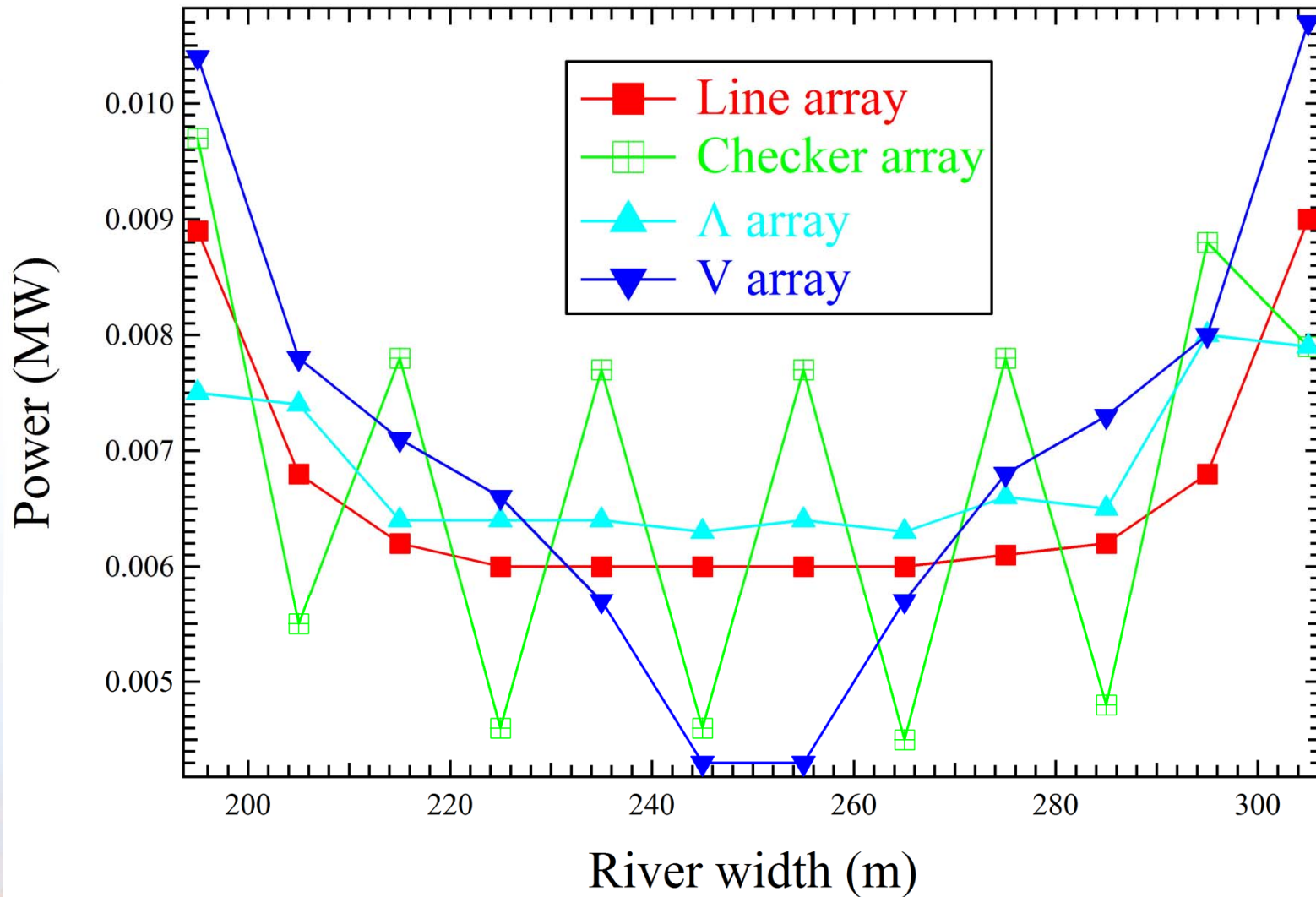
Flows



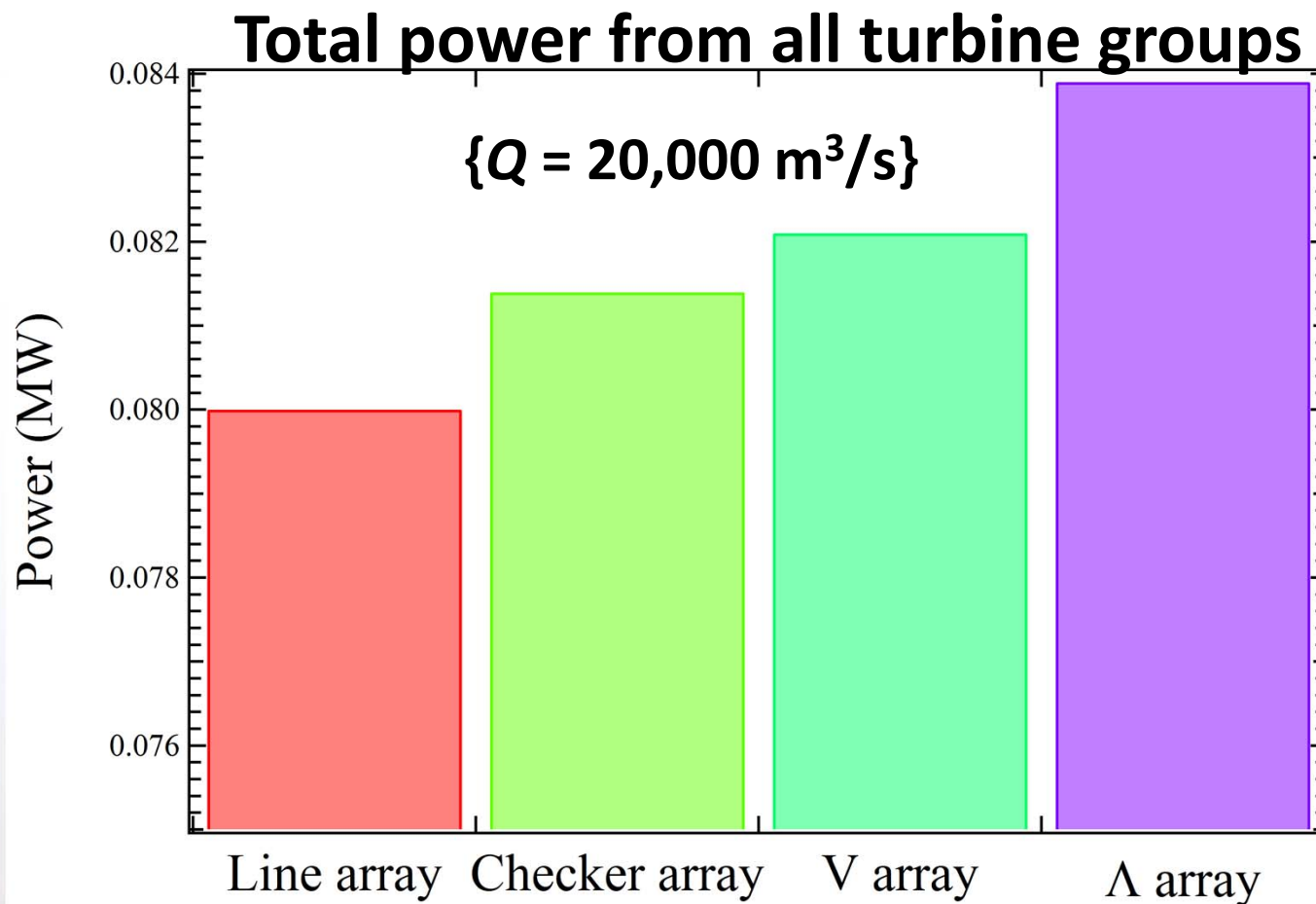
12 turbines comprise each array

Array Performances

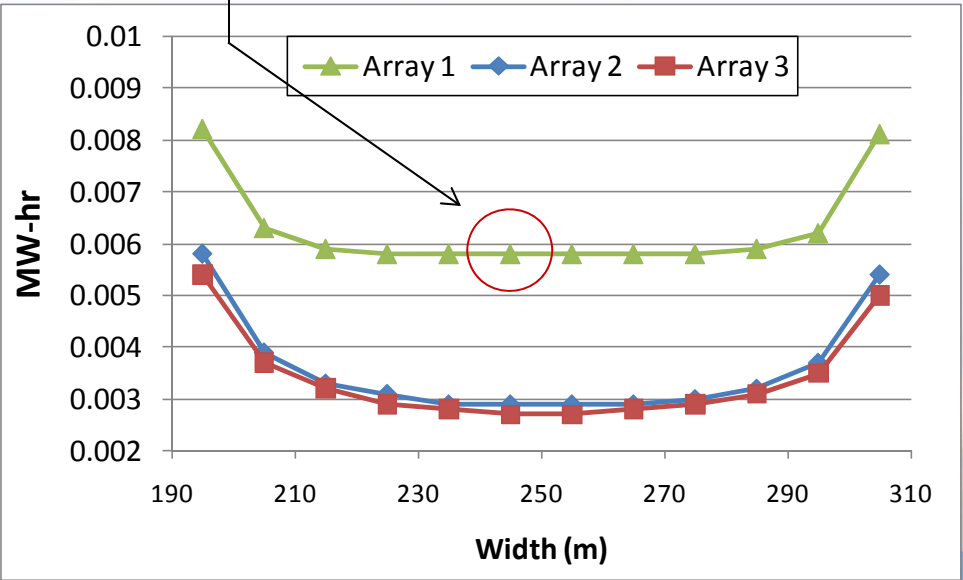
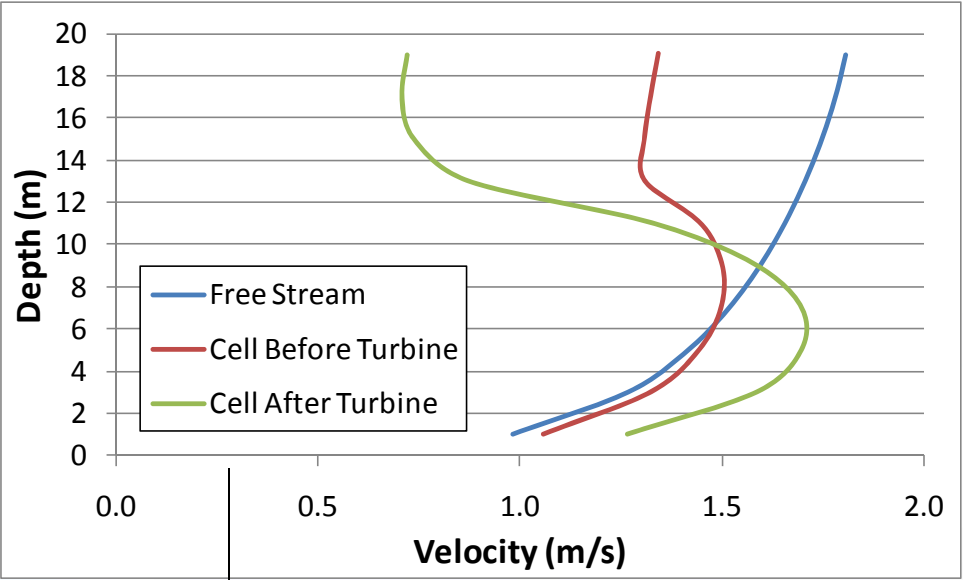
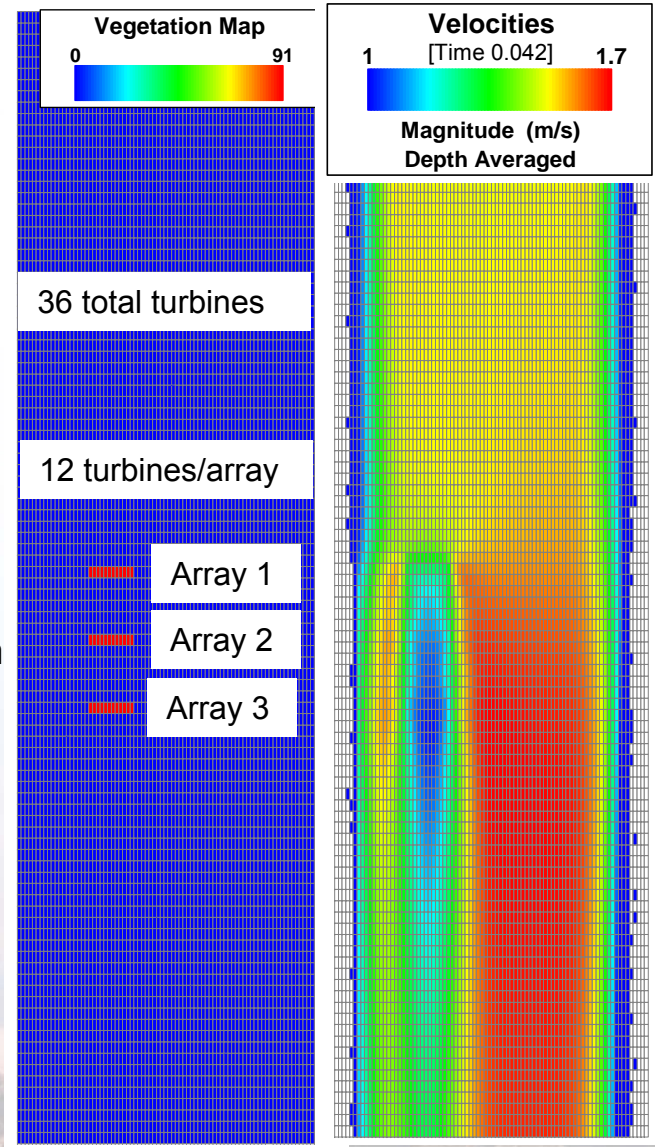
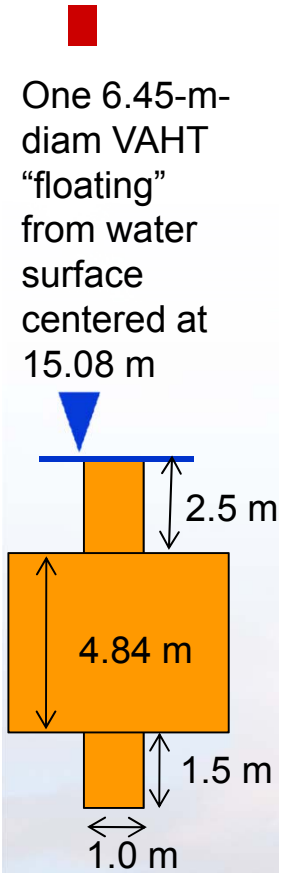
{ $Q = 20,000 \text{ m}^3/\text{s}$ }



Array Performance



Environmental Considerations

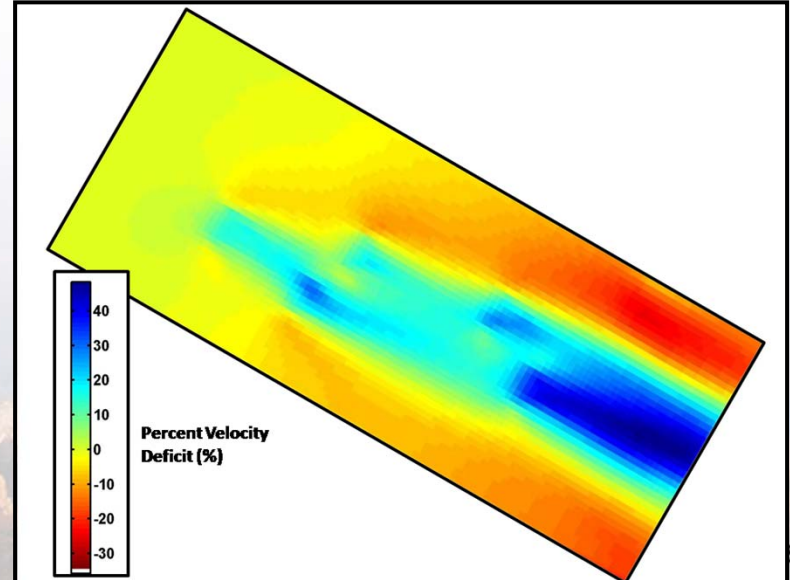
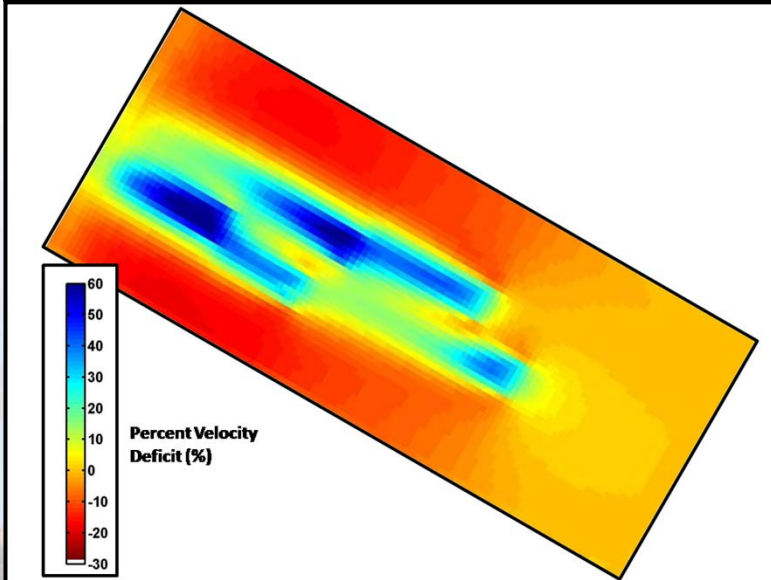
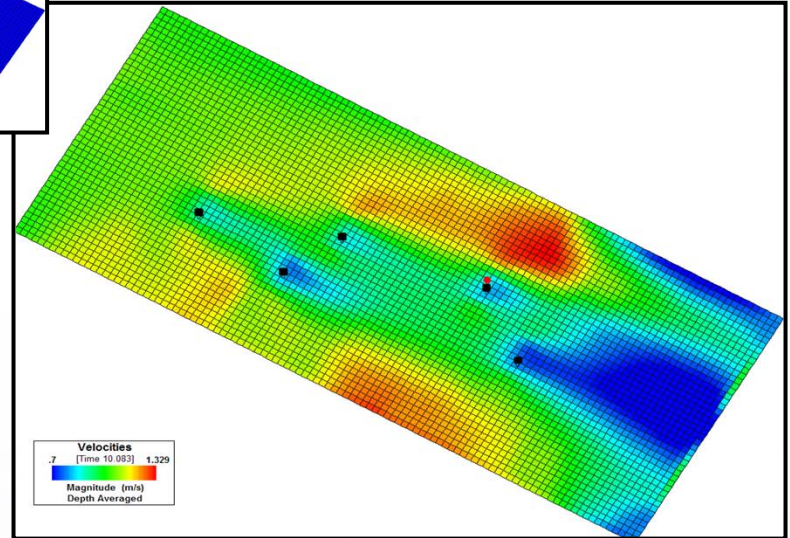
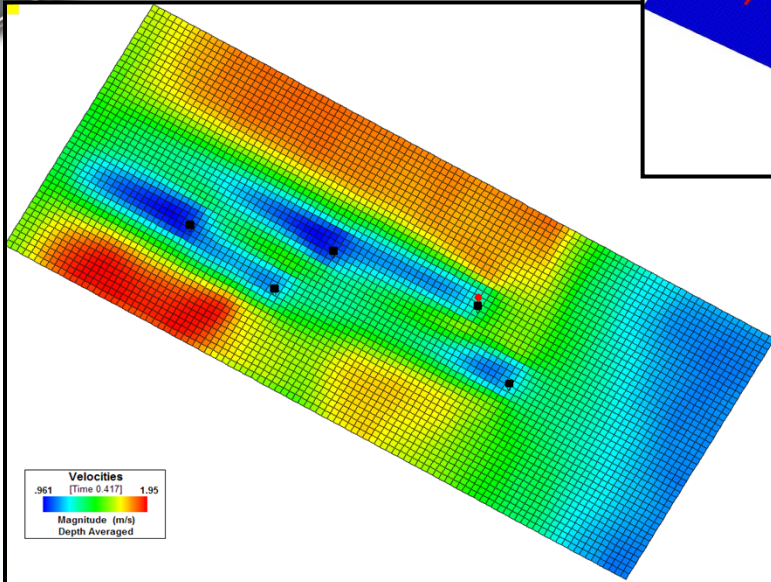
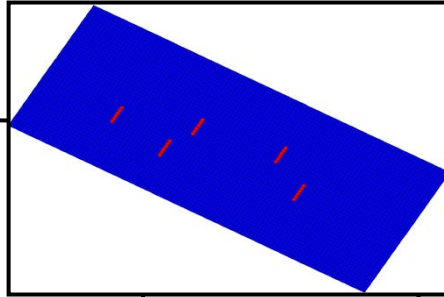




Extra Slides



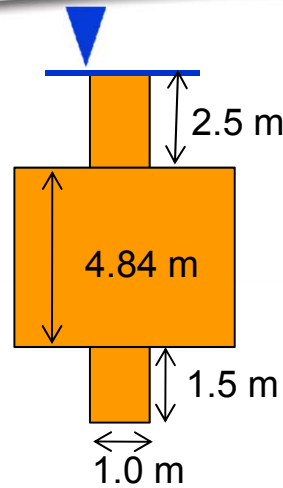
Tidal Array



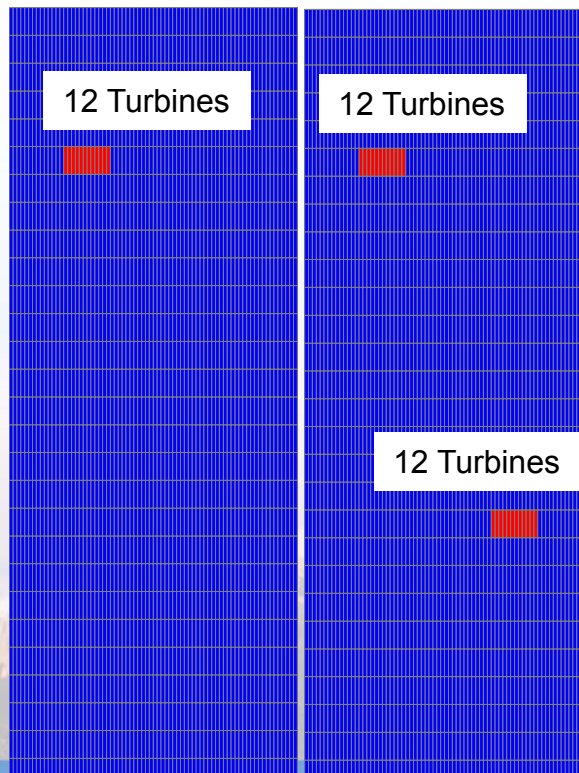
Array Scenarios

{Q = 20,000 m³/s}

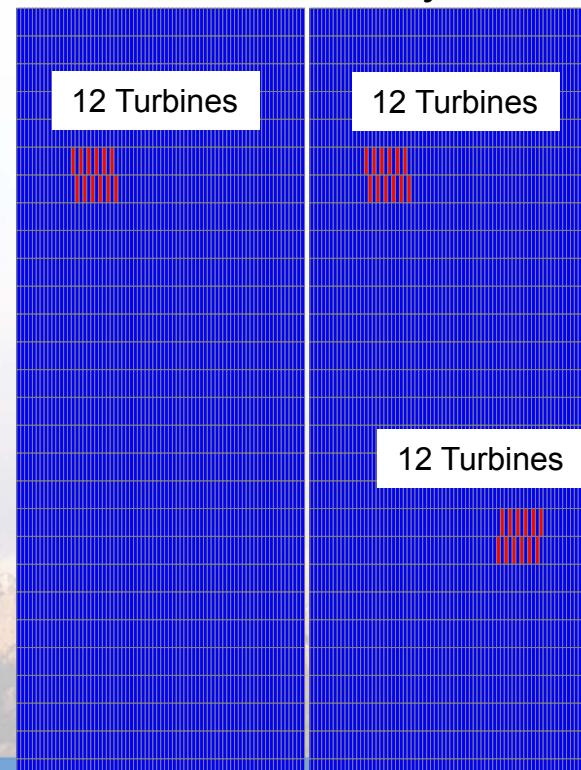
■ = One 6.45-m-diameter VAHT
"hung" from water surface
centered at 15.08 m



Line-Array



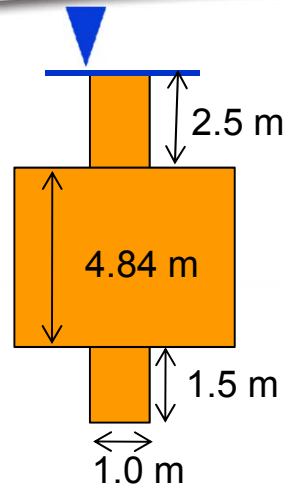
Checker-Array



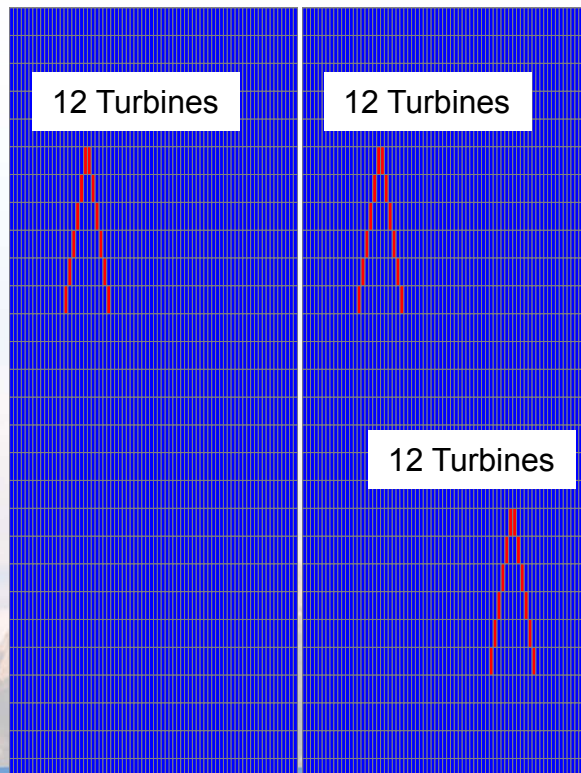
Array Scenarios

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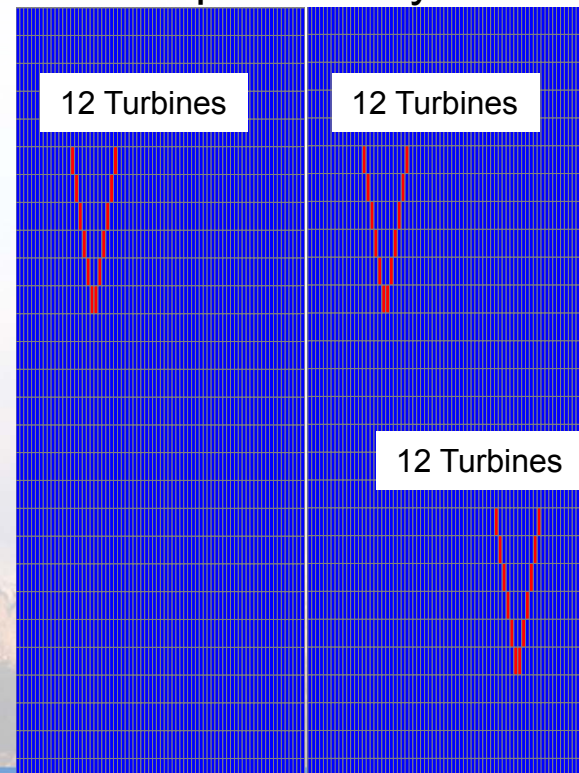
■ = One 6.45-m-diameter VAHT
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V-Array



upsdV-Array



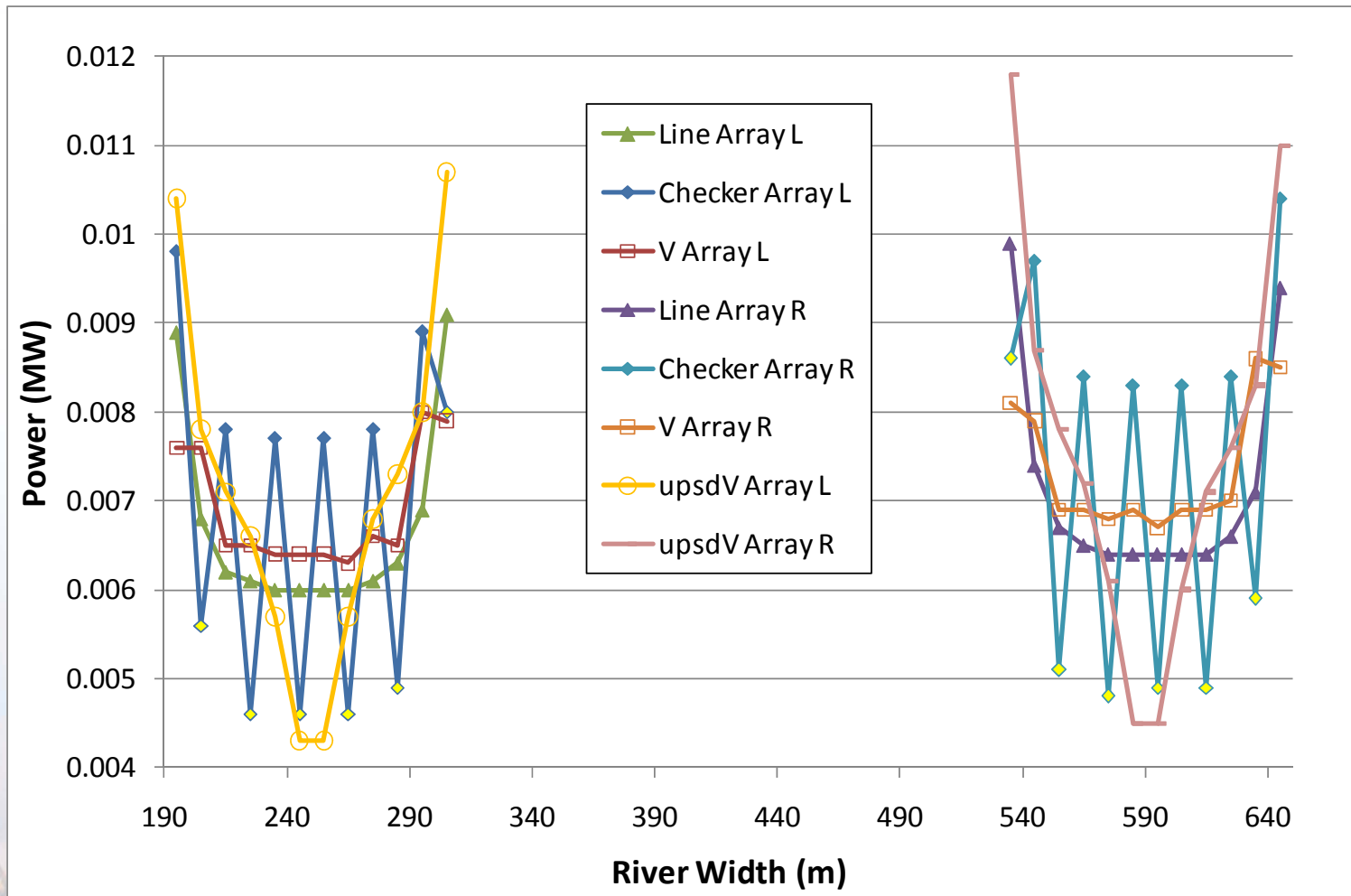
Array Performance

Single Array (1 turbine grouping)



Array Performance

Double Array (2 turbine groupings)



Array Performance

Total power from all turbine groups
L-Left grouping; R-Right grouping

