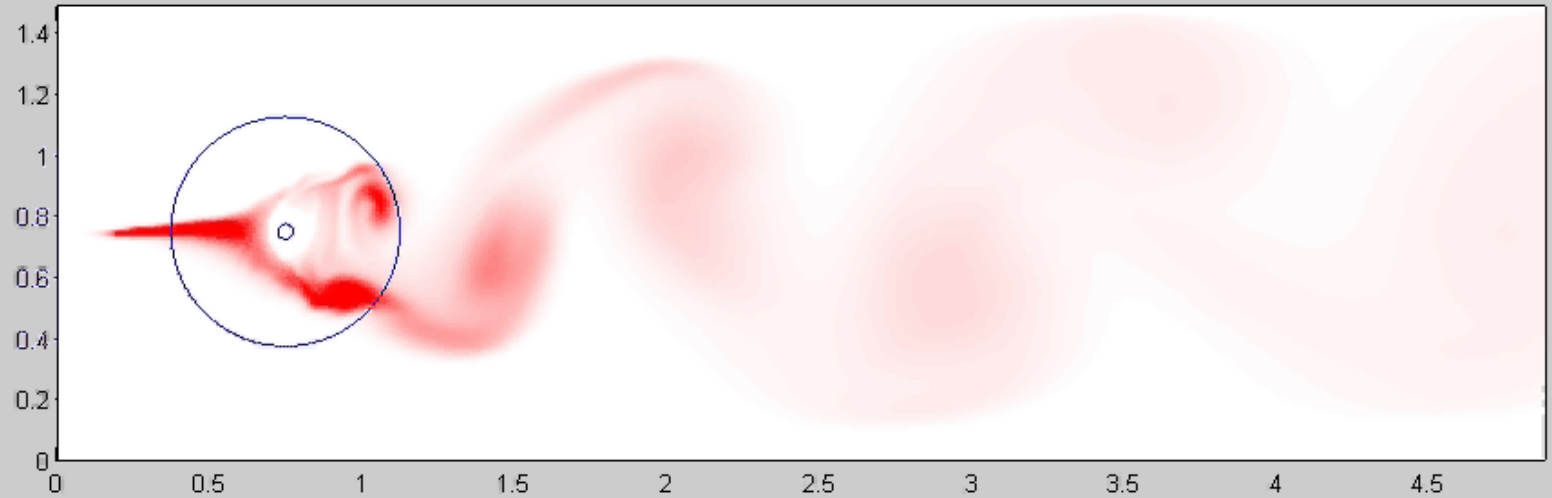
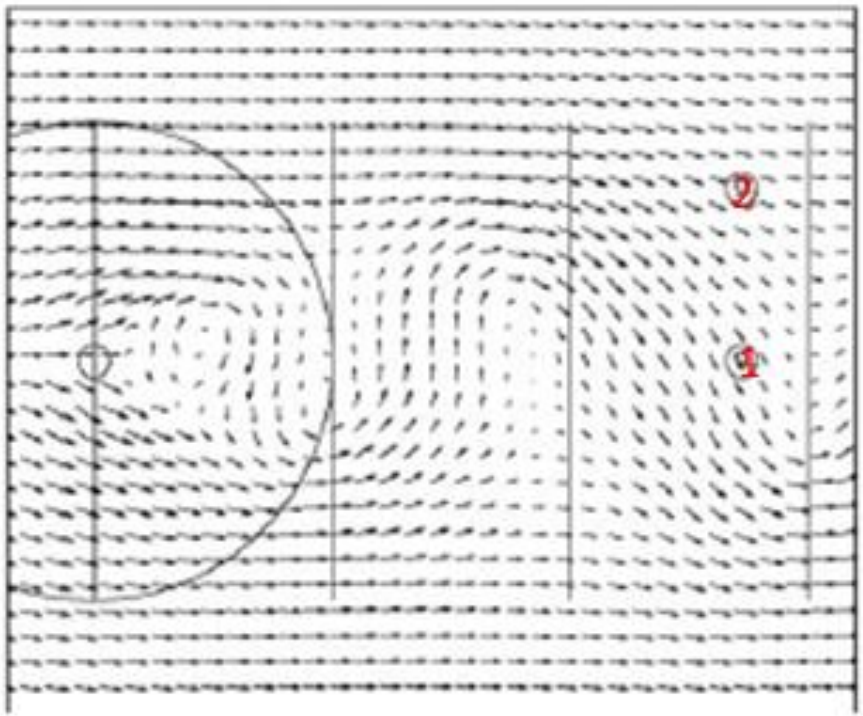
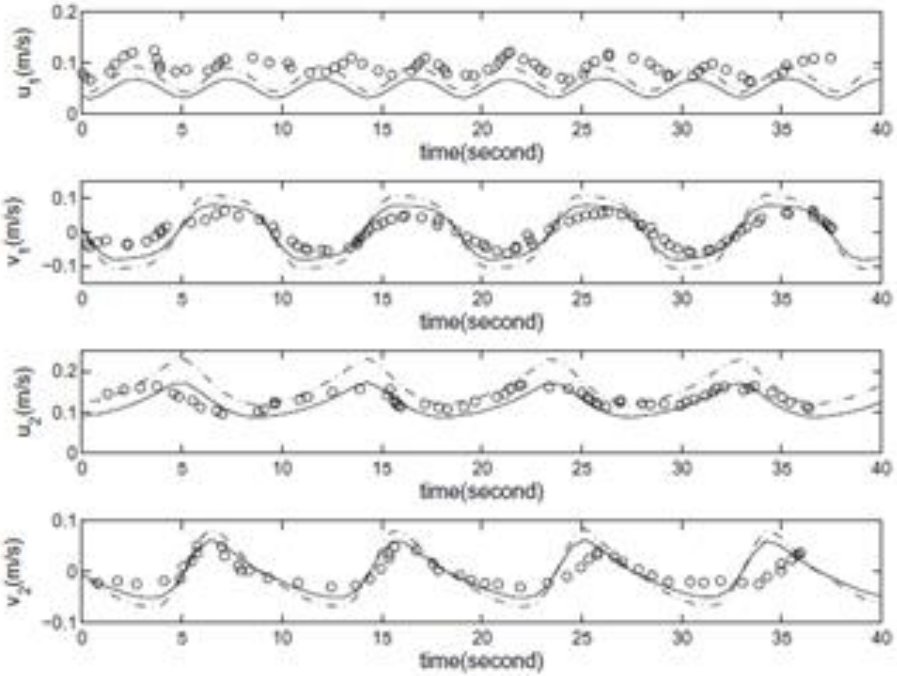
Overview of Datasets – Benchmark #1





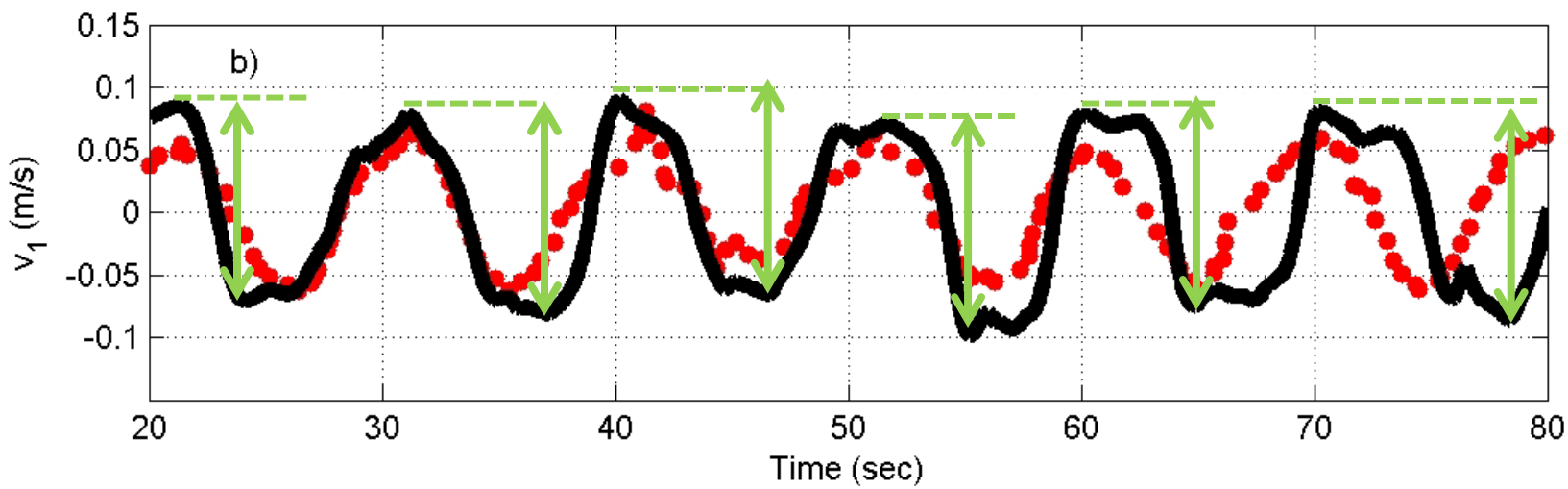


Overview of Datasets – Benchmark #1

We will look at two different comparisons

1) Magnitude of the ***Fluctuation*** of Speed
2) Total Kinetic Energy in the time series

- Use a zero-crossing analysis to identify the individual oscillations in each of the four time series
- Calculate the total fluctuation (max-min speed) for each time series
- Determine the mean fluctuation and the standard deviation of the fluctuations
- Mean provides to "best estimate" from each model
- Deviation provides a measure of the chaotic nature of the flow
- Mean and deviation are calculated for the data as well
    - deviation of the data is significant (~10% of mean); this is physical



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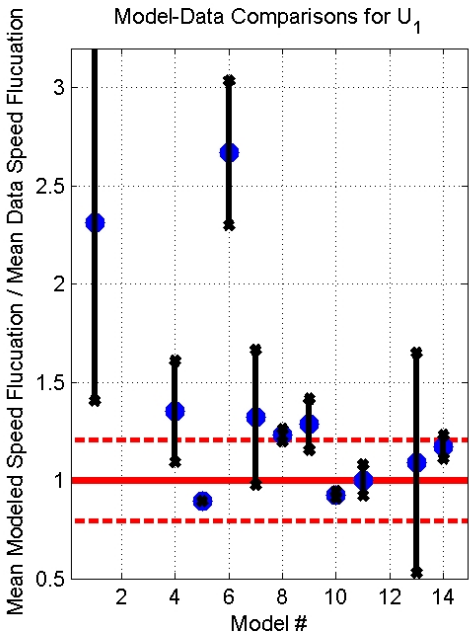

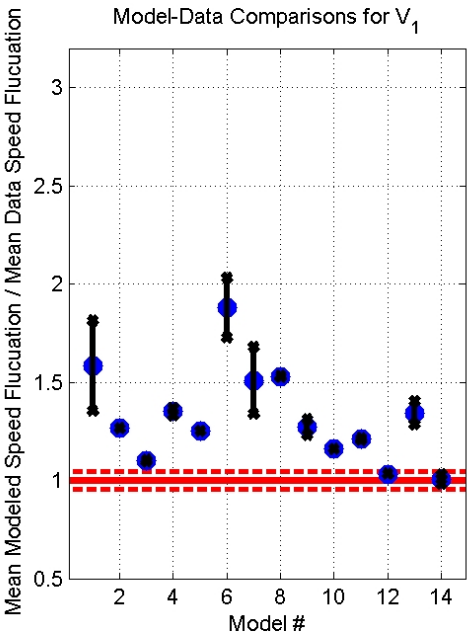

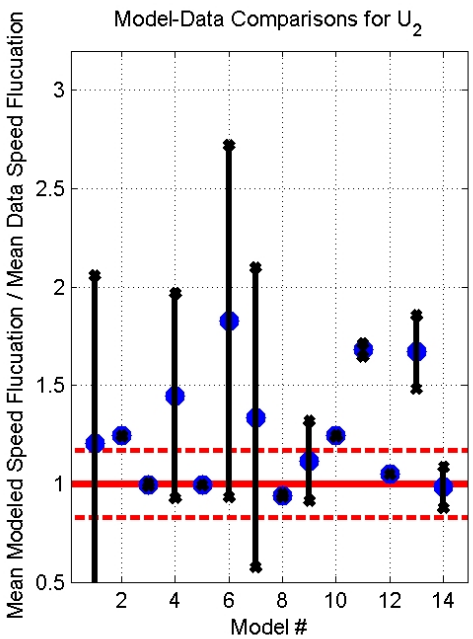

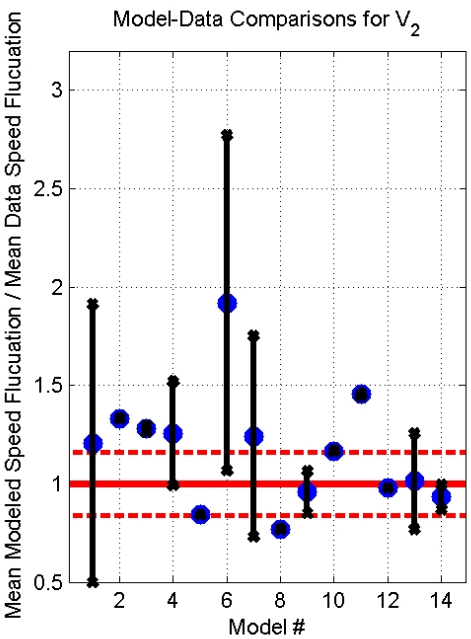

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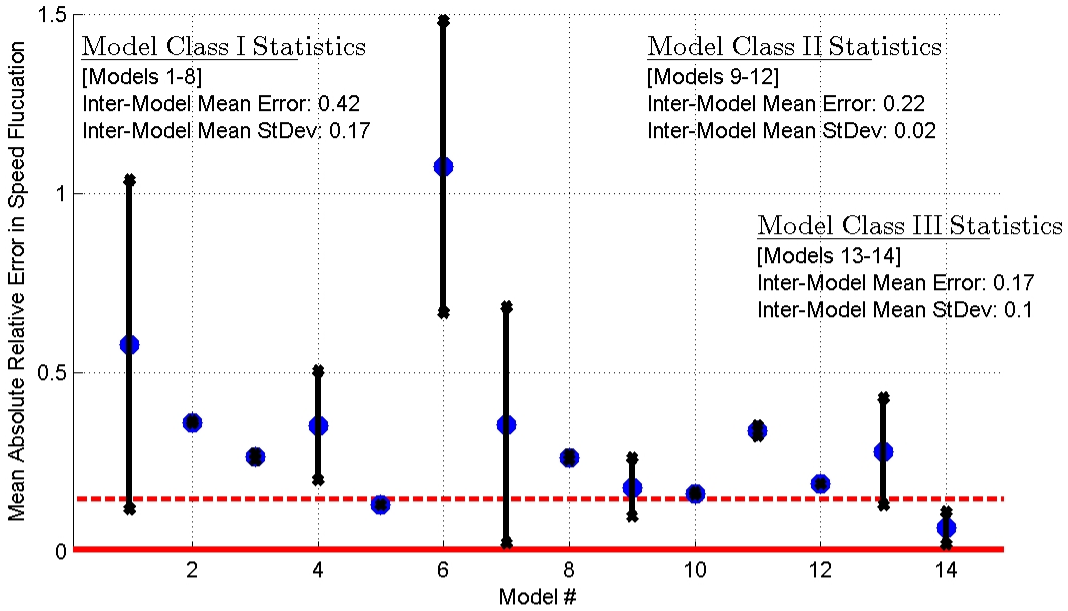
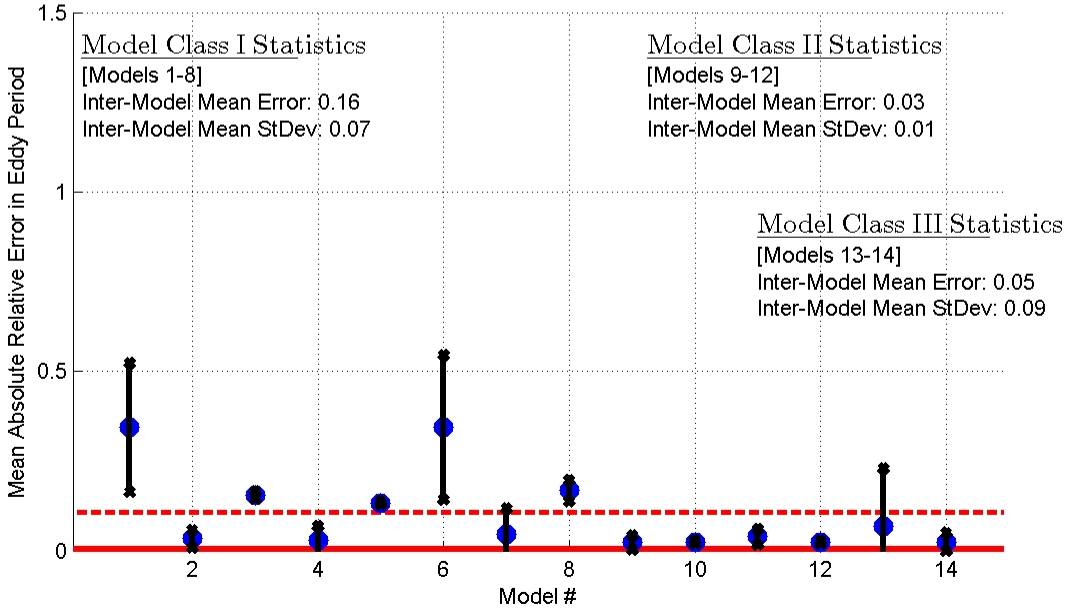


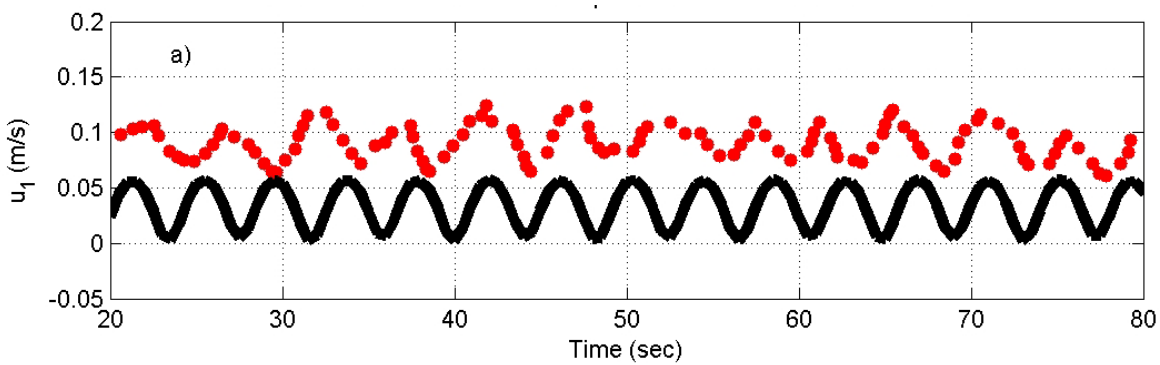


Overview of Datasets – Benchmark #1

We will look at two different comparisons

1) Magnitude of the ***Fluctuation*** of Speed
2) Total Kinetic Energy in the time series

- Use a zero-crossing analysis to identify the individual oscillations in each of the four time series
- Calculate the time-averaged kinetic energy (~integral of velocity^2 w.r.t to time, then divided by the period of the oscillation) for each oscillations
- Determine the mean time-averaged kinetic energy
  - Don't look at the standard deviation here. For this calculation, the standard deviation is a measure similar to the Fluctuation of the other comparison (but not quite the same)
- Mean is calculated for the data as well
- The main difference between the two comparison methods is that 2) will include the offset seen in the u data, but only found in a couple models



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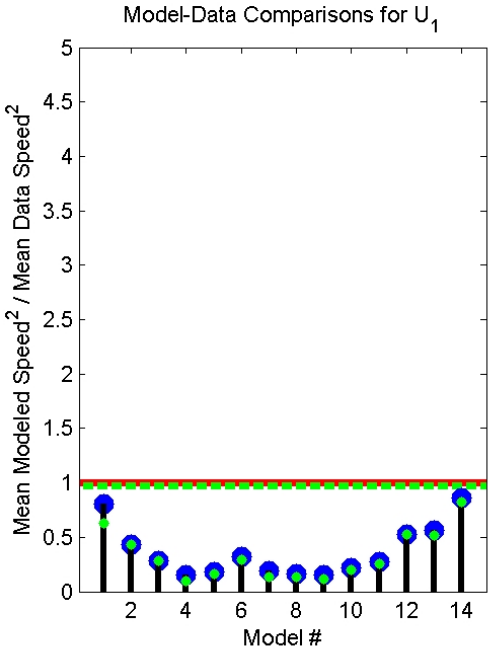

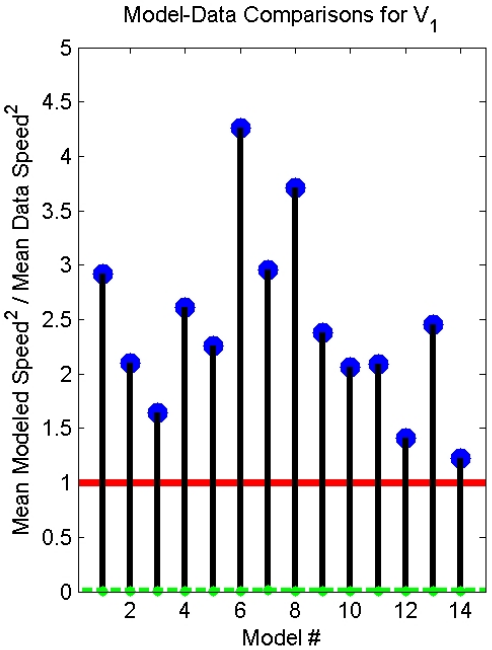

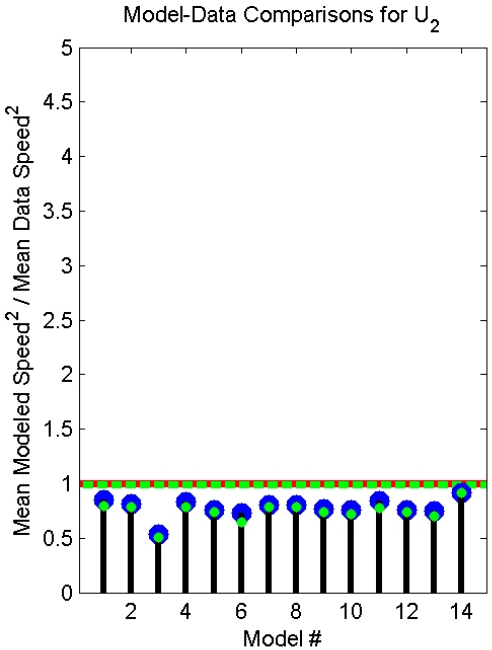

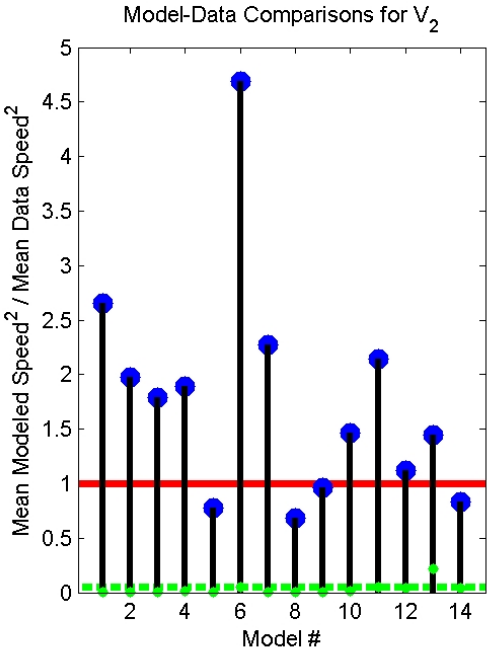

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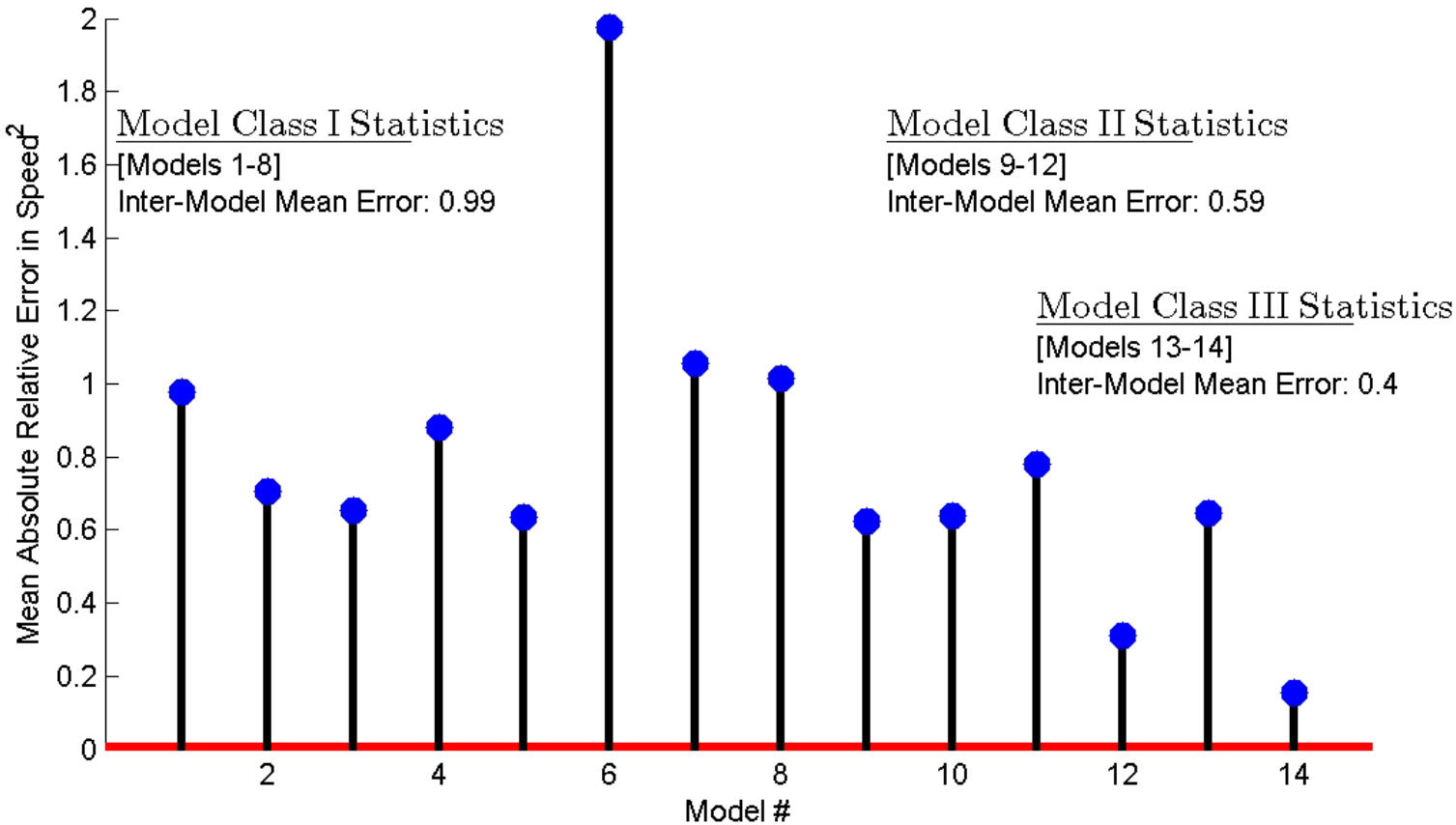


Discussion will focus on effect of:

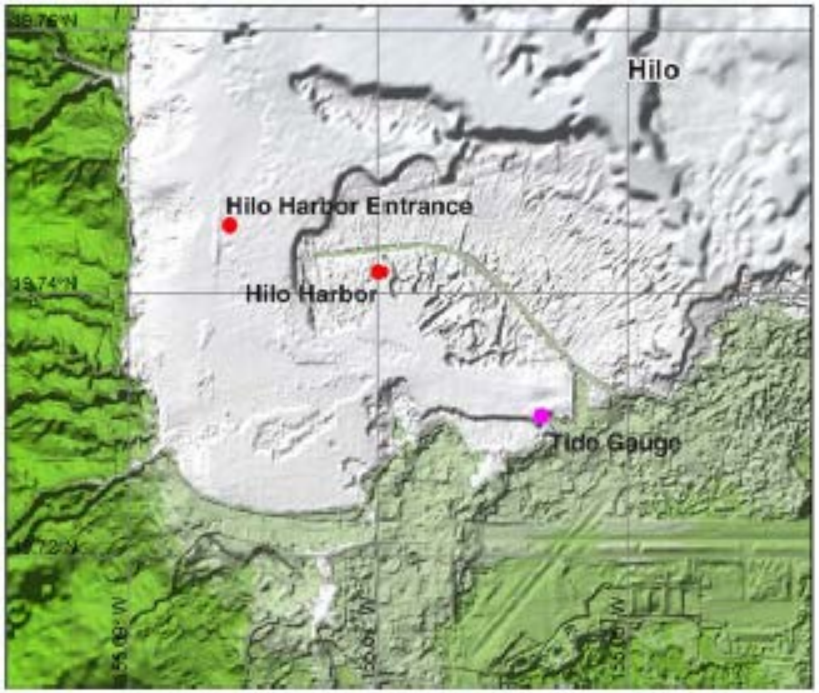
- Numerical scheme, model equations, and dissipation mechanisms

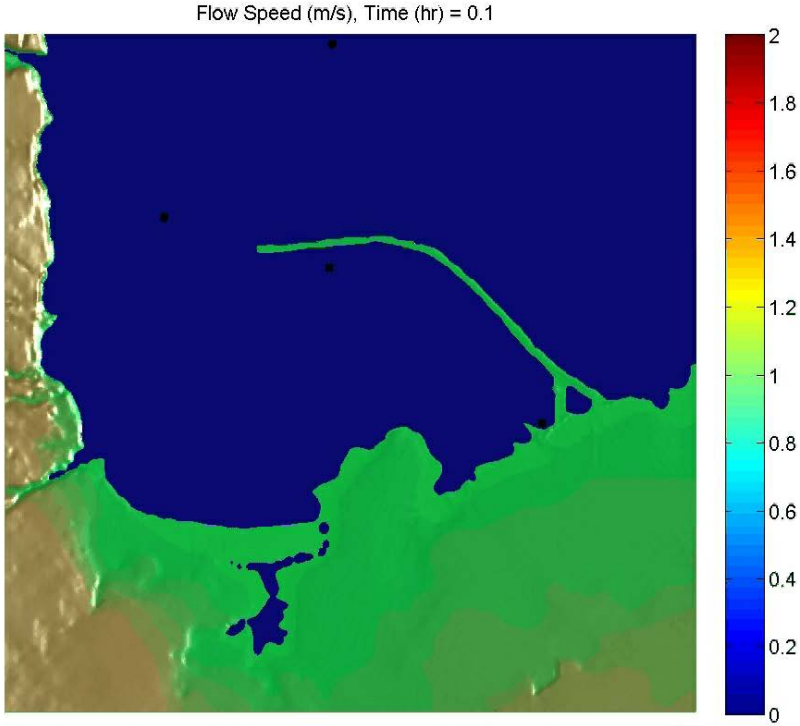
on the prediction of

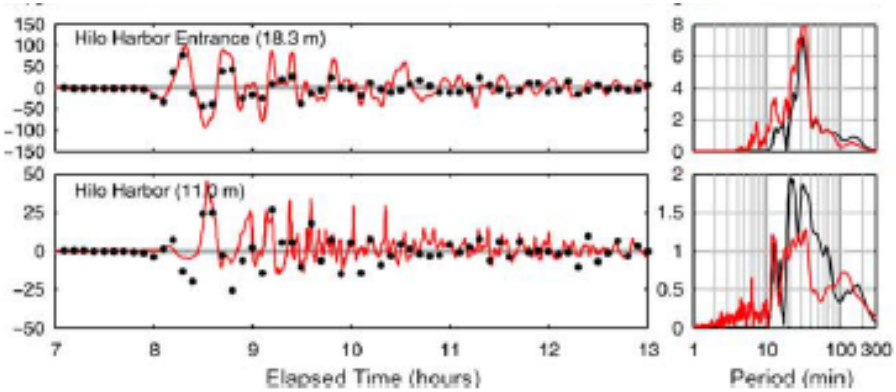
- Fluctuation prediction (magnitude and frequency) and energy / force potential

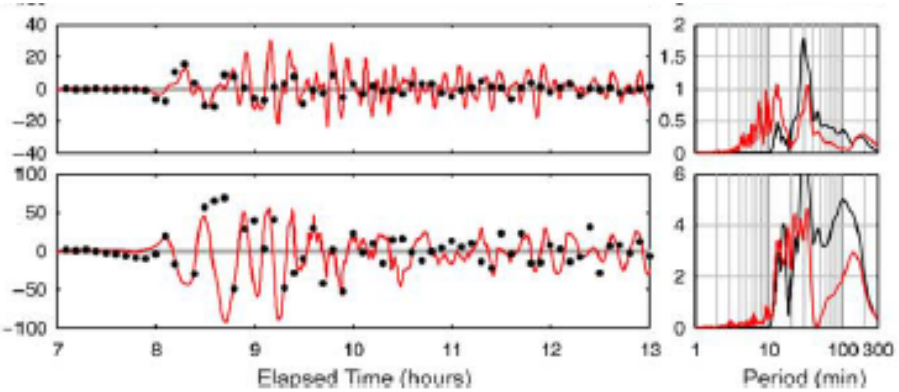
Will develop a large table that include the model parameters for these properties

Overview of Datasets – Benchmark #2





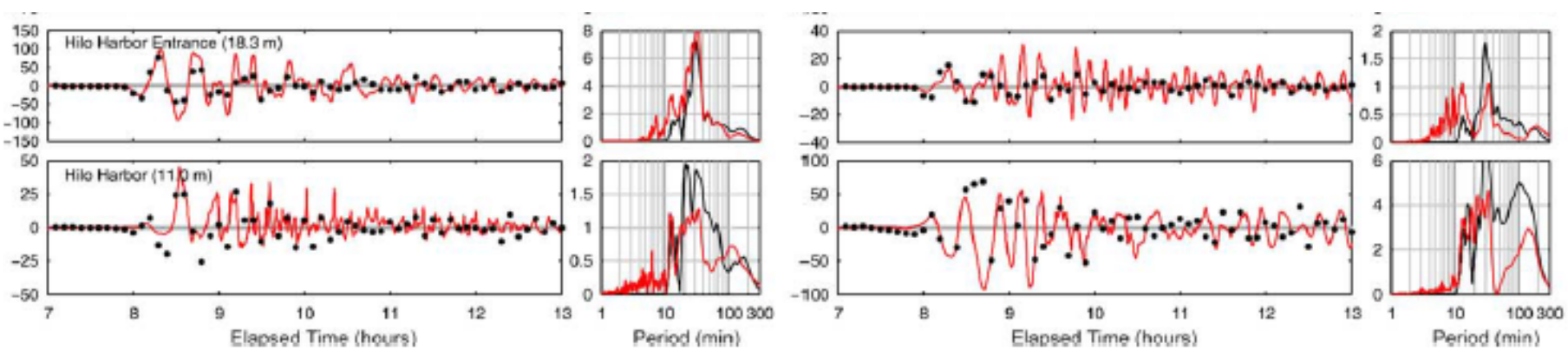




Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

1) Look at model-data comparisons at the Tide Gage (time series comparison)
   - This establishes an accuracy / model correlation for elevation
2) Look at model-data comparisons at the ADCPs (time series comparison)
   - Compare the accuracy / model correlation for speed to that for elevation
3) Inter-model 2D surface comparisons
   - Create mean and variation surfaces from the maximum speed data provided by each modeler for the three different resolutions
   - Examine resolution dependence, both locally and in the spatially-average sense
   - Examine numerical scheme and model physics dependence, focusing on the areas of high inter-model standard deviation
   - Present the approach of velocity threshold prediction through ensemble modeling, to provide likelihood of high flow speeds



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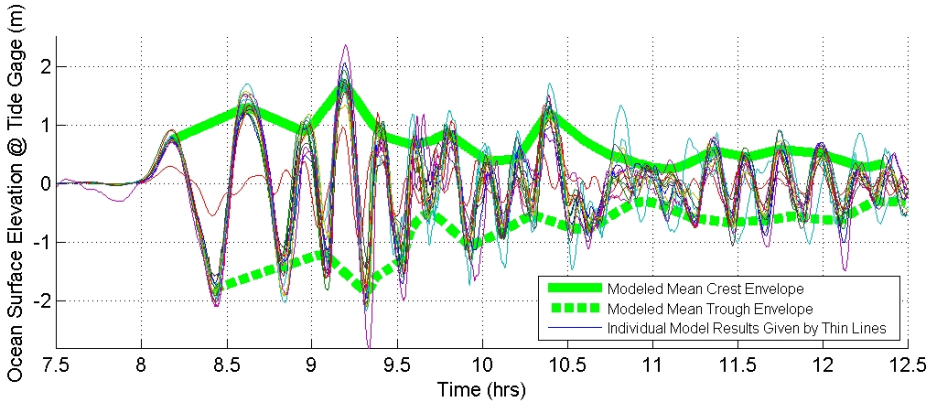

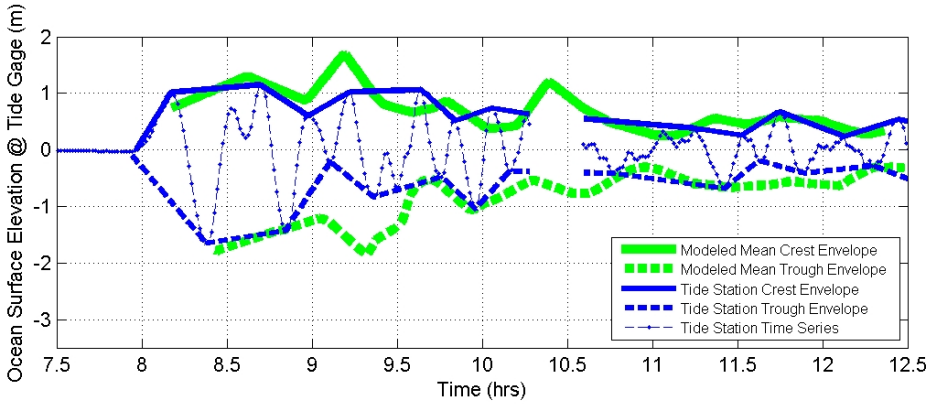

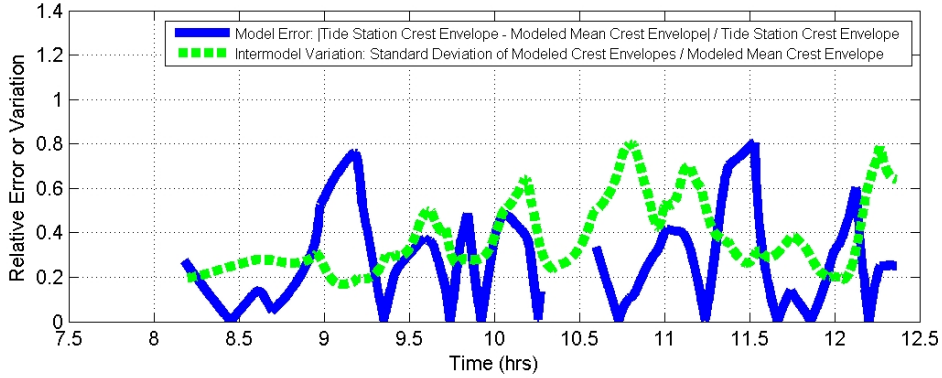

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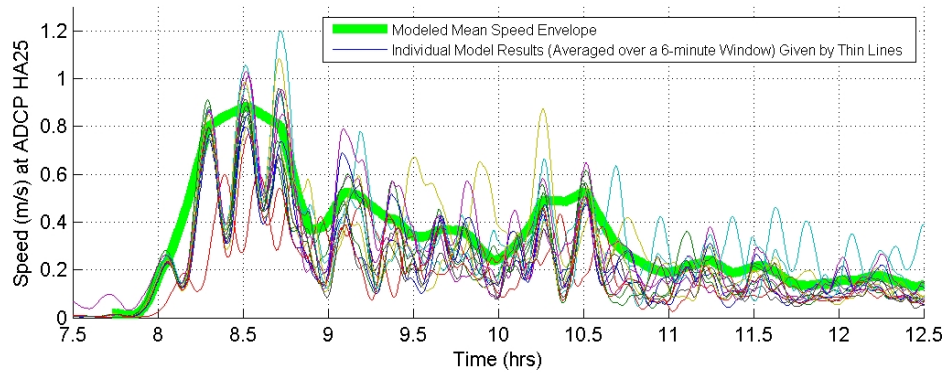

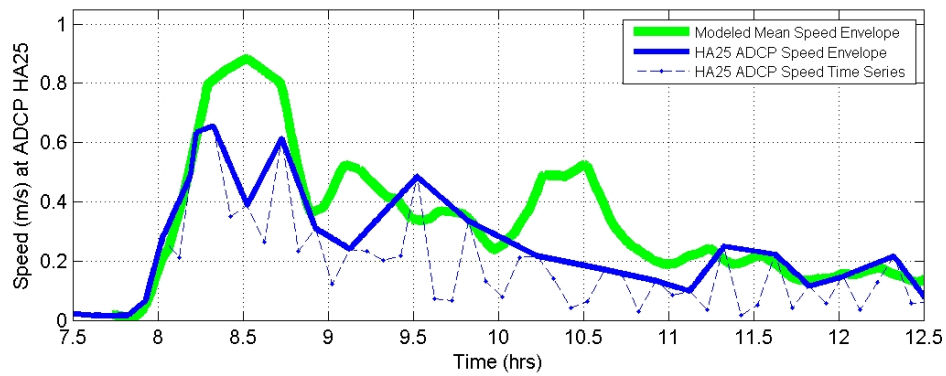

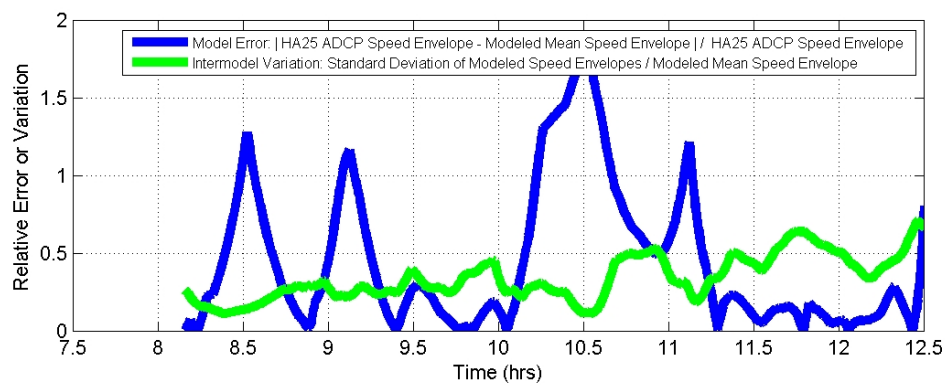

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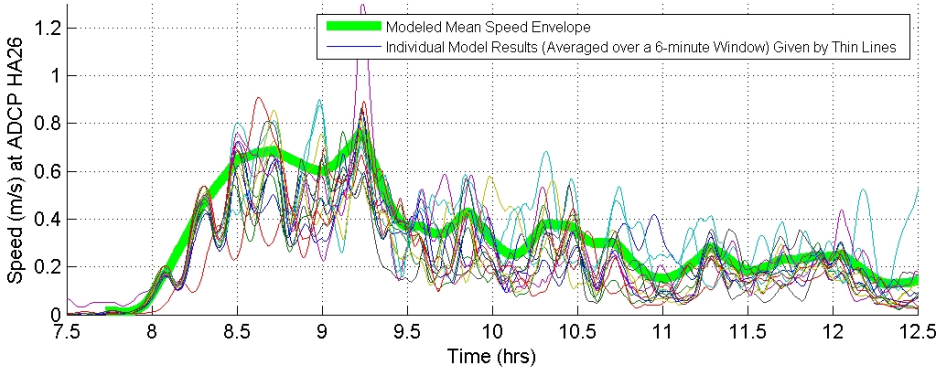

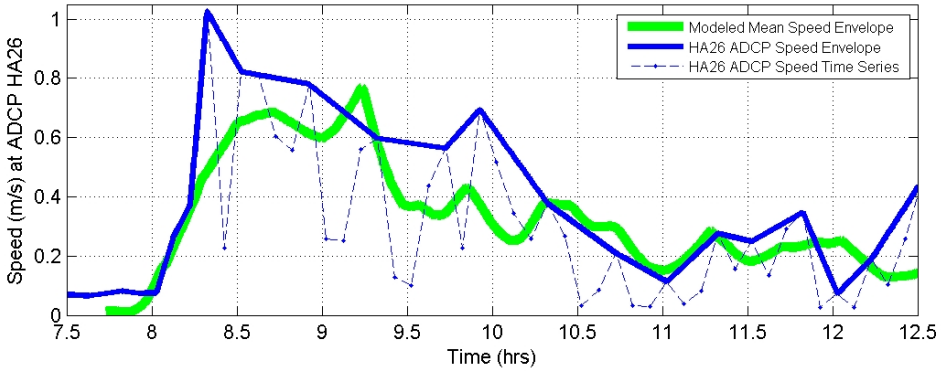

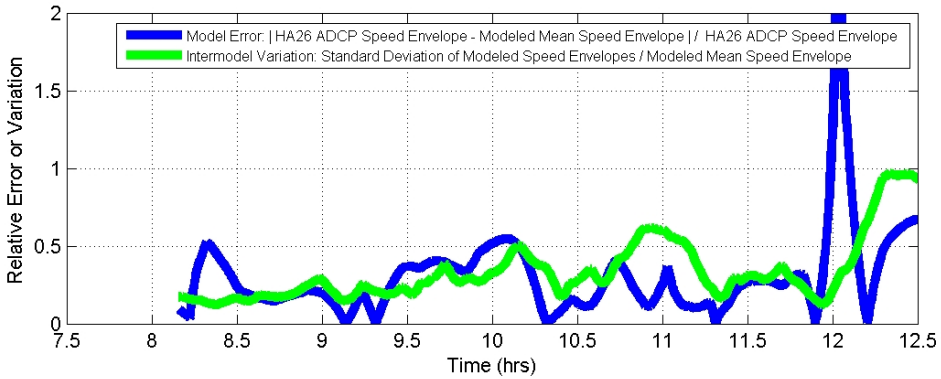

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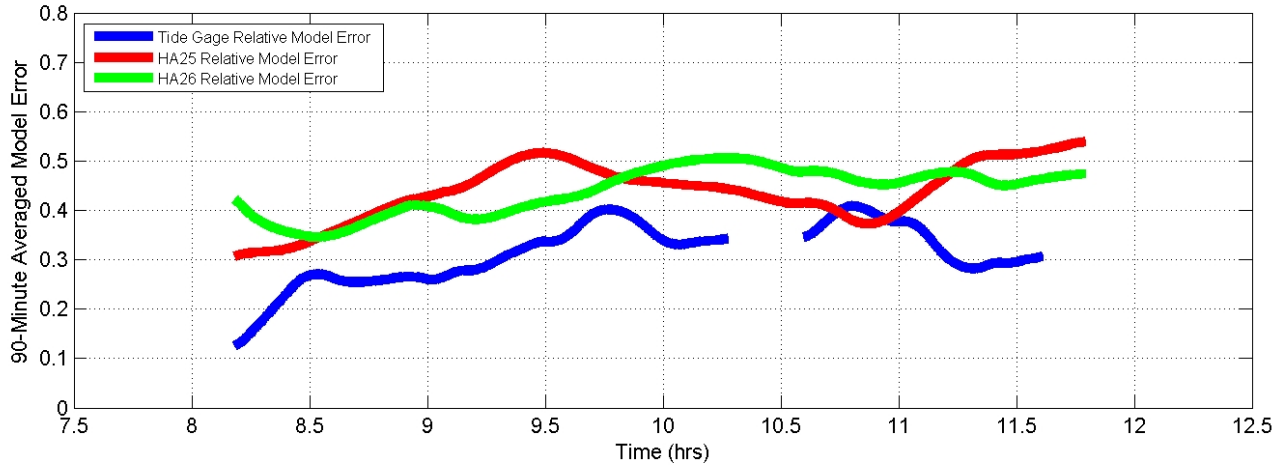
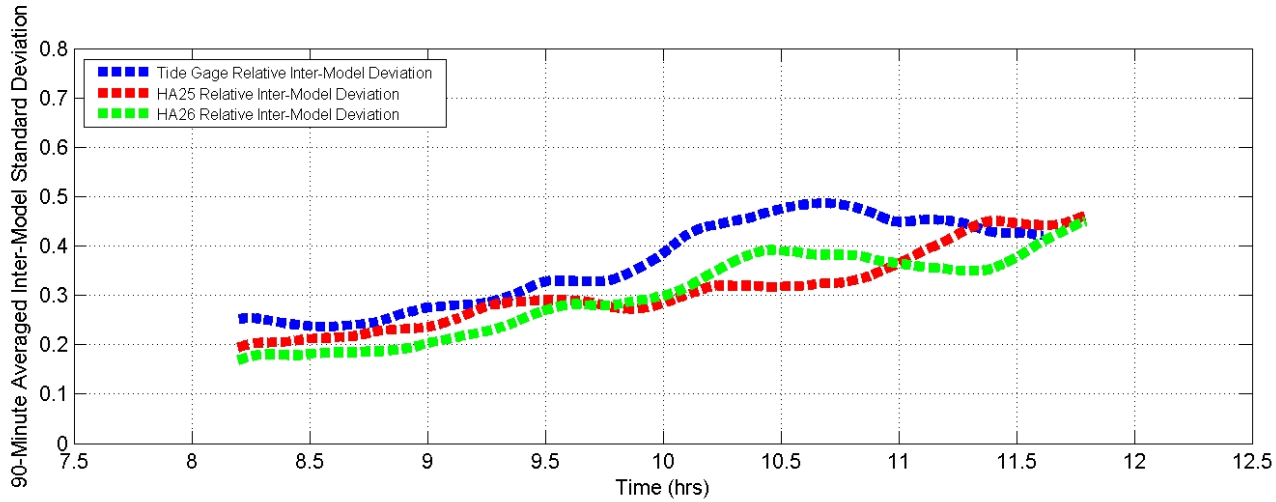
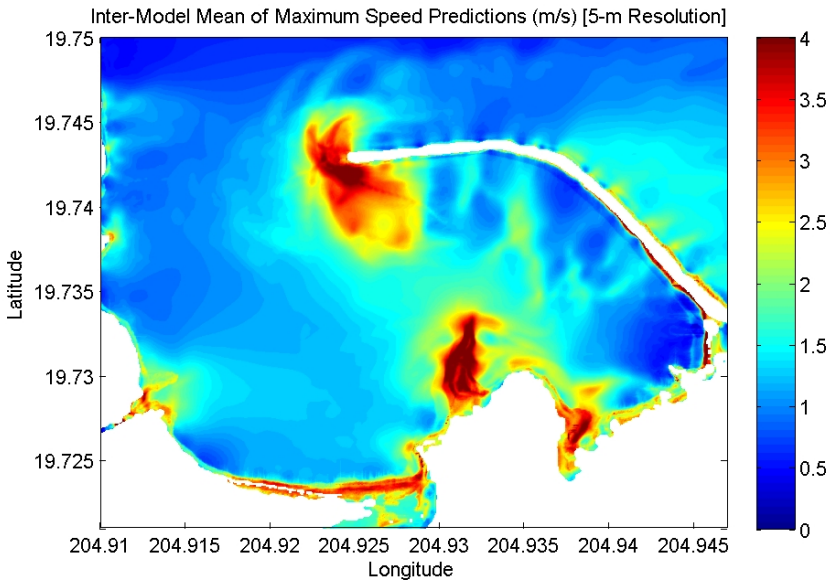


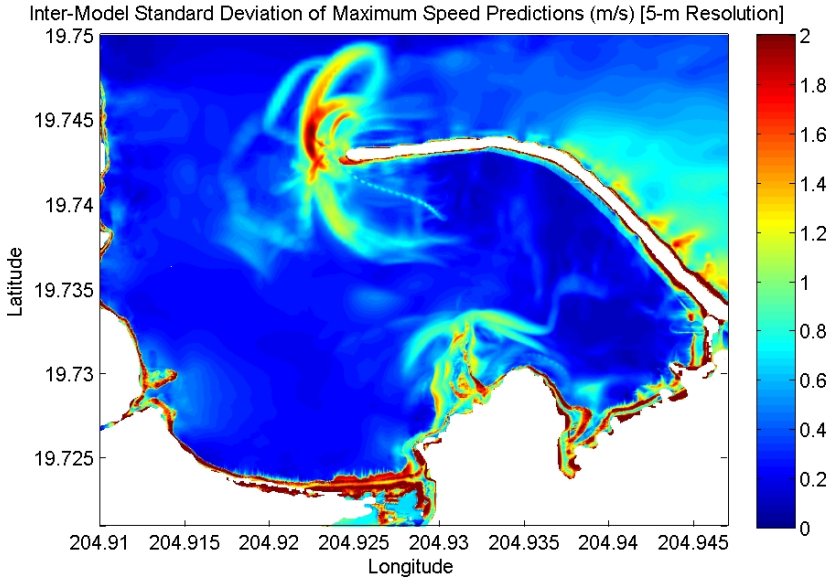


Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   - Create mean and variation surfaces from the maximum speed data provided by each modeler for the three different resolutions

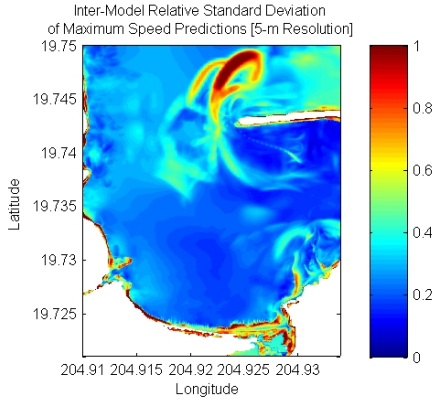


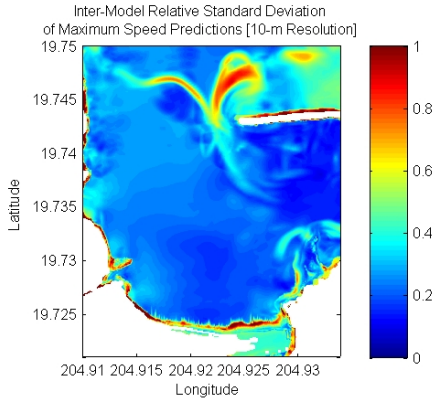


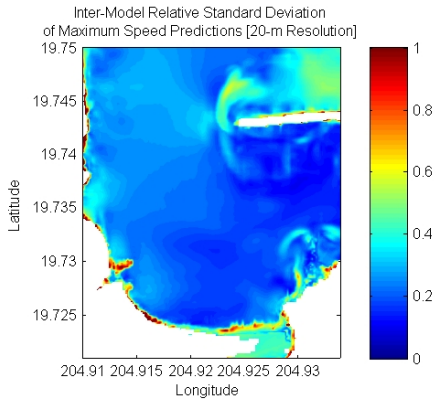
Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   - Examine resolution dependence, both locally and in the spatially-average sense



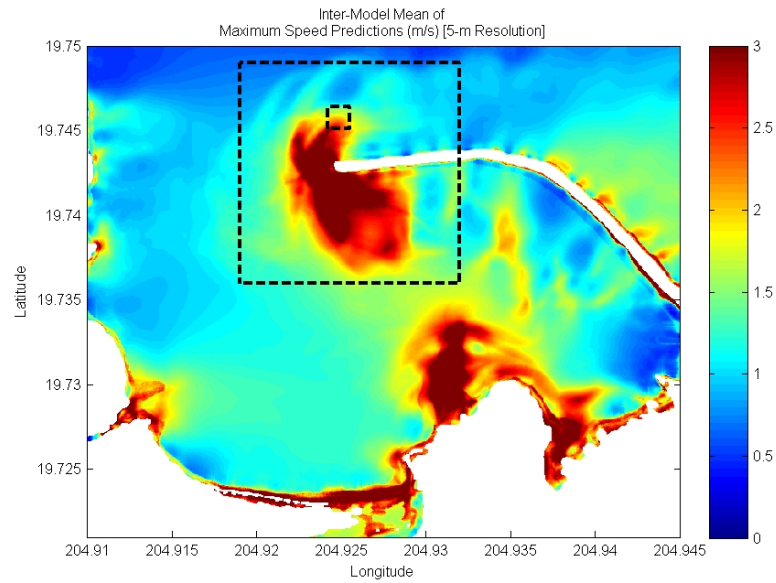


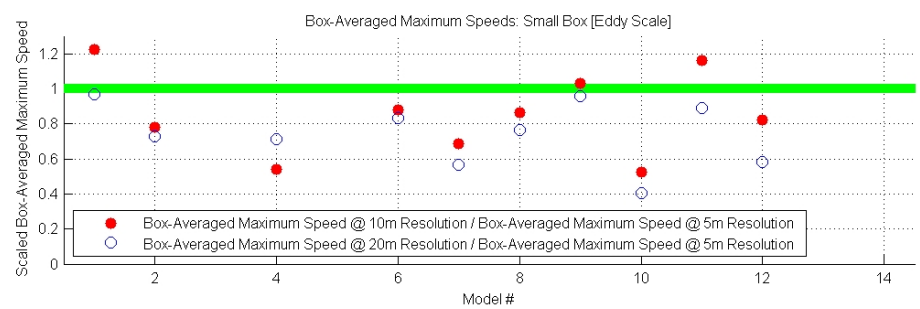


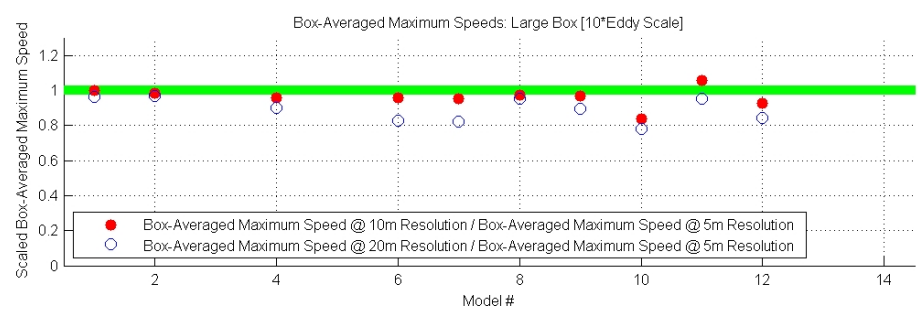
Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   - Examine resolution dependence, both locally and in the spatially-average sense
   - Examine numerical scheme and model physics dependence, focusing on the areas of high inter-model standard deviation





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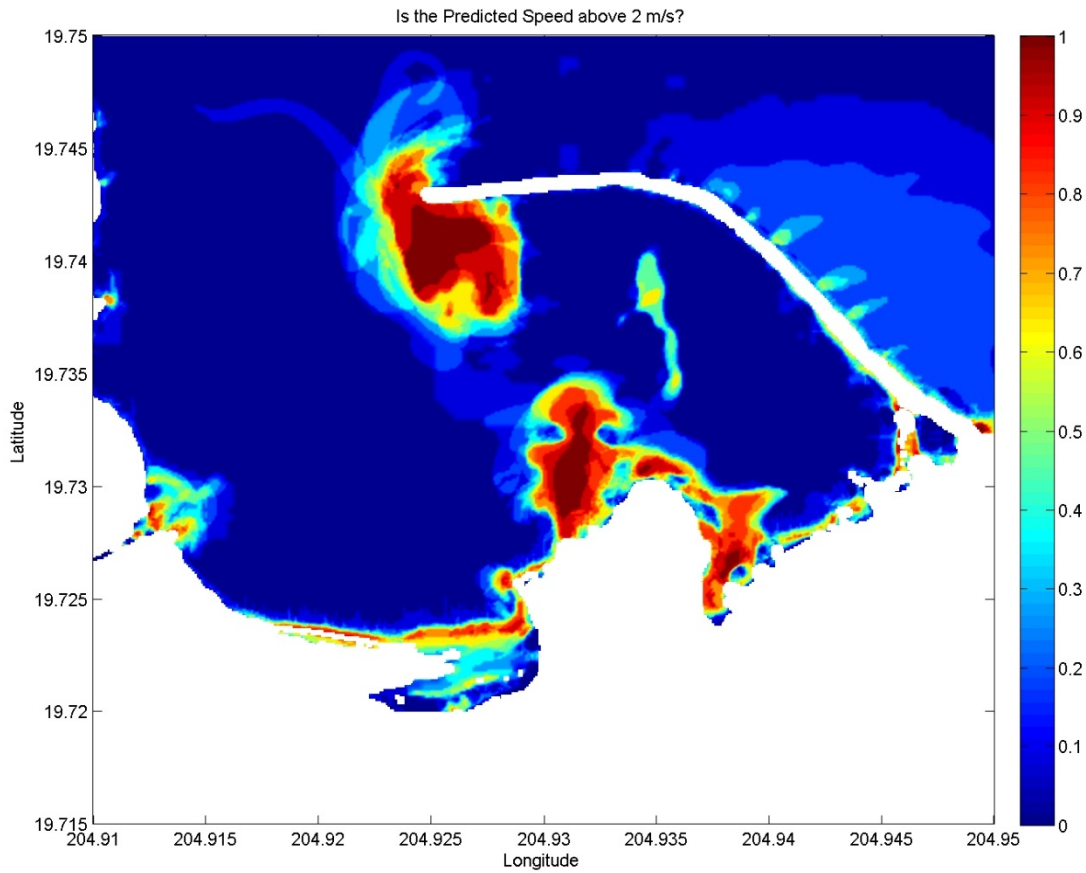
Overview of Datasets – Benchmark #2

Analysis approach here will follow closely the discussion during the workshop

3) Inter-model 2D surface comparisons
   - Present the approach of velocity threshold prediction through ensemble modeling, to provide likelihood of high flow speeds



Overview of Report

- Have received 12 individual modeler reports (one more coming soon…)
- Figures inserted and formatting checked in 9 of the 12 received reports
- These reports will be compiled and circulated by the end of July

MODELER PRESENTATIONS
9:15-9:55 Yalciner and Kanoglu (METU, Turkey) - BM problems: 1,2,3,4,5
9:55-10:20 Horrillo and Knight (NTWC, AK) - BM problems: 1,2
10:20-10:35 Break
10:35-11:10 Arcas - BM problems: 1,2,3,4
11:10-11:35 Nicolski (UA-F, AK) - BM problems: 1,2 -
11:35-12:05 Tolkova (NWRA, WA) - BM problems:1,2,3,4,5 –
12:05-1:30 Lunch
1:30-2:10 LeVeque (UW, WA) - BM problems: 1,2,3,4,5 -
2:10-2:40 Li (AECOM, CA) - BM problems: 1,2,5 -
2:40-3:10 Macias (Univ of Malaga, Spain) - BM problems:1,2,3,4,5 –
3:10-3:25 Break
3:15-3:55 Lynett (USC, CA) - BM problems:1,2-
3:55-4:25 Yamazaki/Bai (UH, HI) - BM problems:1,2,5 -
4:25-4:50 Zhang (VIMS, VA) - BM problems: 1,2 -

February 10th
8:45-9:25 Kirby (UD, DE) - BM problems: 1,2,3,4,5 -
9:25--9:55 Pampell (TAMU-G, TX) - BM problems: 1,2 -
9:55-10:20 Break
10:20-10:50 Roeber (Tohoku University, Japan) - BM problems: 1,2,5 -
10:50-11:20 Arikawa (PARI, Japan) - BM problems: 1,2,4 -
11:20-11:50 Sampath (Centriod Pic, CA / Idaho National Labs) - BM problems: 1,2,5 -

Overview of Report

- Summary report / journal paper is at about the 50% mark
- Complete draft probably not ready to be circulated in late July / early August
- The authorship of the journal paper is going to be large; internal revisions and comments may take a few weeks

Inter-Model Analysis of Tsunami-Induced Coastal Currents

Patrick J. Lynett[a], Kara Gately[b], Rick Wilson[c], Diego Arcas [d,e], Yefei Bai[f], Yoshiki Yamazaki[f], Kwok Fai Cheung[f], Alyssa Pampell-Manis[g], Juan Horrillo[g], James T. Kirby[h], Stephan T. Grilli[i], Fengyan Shi[h], Babak Tehranirad[h], Yong Sung Park[j], Michael Shelby[i], Randall J. LeVeque[k], Frank I. González[l], Loyce M. Adams[k], Jorge Macías[m], Manuel J. Castro[m], Sergio Ortega[n], Cipriano Escalante[m], José Manuel González-Vida[o], Ahmet Cevdet Yalçıner,[p] Andrey Zaytsev[q], Utku Kânoğlu[r], Gozde Guney Dogan[p], Deniz Velioğlu[p], Rozita Kian[p], Betul Aytore[p], Naeimeh Sharghivand[r], Dmitry J. Nicolsky[s], Volker Roeber[t], Troy W. Heitmann[f], C. Gabriel David[u], Jeremy D. Bricker[t], Elena Tolkova[v], and Y. Joseph Zhang[w]

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[b] NOAA, National Tsunami Warning Center, Tsunami Research Center, Palmer, AK 99645
[c] California Geological Survey, Seismic Hazards Mapping Program - Tsunami Projects, Sacramento CA 95814
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