



# Compare Tidal Predictions

Preliminary results from comparing tidal predictions generated as a result of analysis of a common data set by different analysis software



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## TASK B - OVERVIEW



International  
Hydrographic  
Organization

- Survey completed, presentation available online
- **Analysis of common data sets:**
  - Increased the number of common data sets
  - Provided a framework for reporting results
  - Everyone was challenged to analyse some or all sets
  - **Comparing results** (on-going)
- Guideline for analysis – no progress to report



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# PRELIMINAR COMPARISON OF RESULTS



International Hydrographic Organization

- Results from Germany, Spain, New Zealand, Argentina, Norway
- Compared number of constituents, and some main ones
- Compared some statistics and tidal planes
- Some general considerations of the different predictions

	Buenos Aires	Altimetry (ARG)	Lytelton	Yokosuka	Awashima	Egersund	Oslo	Vardoe	Barcelona	Poole Harbour	Boston	Panama City	Seattle	Brest	Callao	Hamburg	Cuxhaven	Ilha Fiscal	Port Nolloth	Corral	Punta Arenas	Coruna	Saint Malo	
<b>Germany</b>	x	x	x	x	x	x	x	x	x	x	x	x	x		x			x	x	x	x			
<b>Spain</b>				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
<b>New Zealand</b>	x		x				x	x	x	x	x	x	x	x	x	x		x	x					
<b>Argentina</b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<b>Norway</b>			x	x	x	x	x	x	x		x	x	x	x	x	x	x			x			x	

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# EXAMPLE: BARCELONA

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Hydrographic  
Organization

Barcelona Spain	Number of constituents	
	Resolvable	Significant
Germany	105	29
Spain	241	62
New Zealand	68	20
Argentina		10
Norway	68	50

Barcelona Spain	SA		M2		S2	
	Amplitude	Phase	Amplitude	Phase	Amplitude	Phase
Germany	0,071	25,9	0,046	213,5	0,016	231,1
Spain	0,065	265,5	0,046	213,4	0,016	230,5
New Zealand	-	-	0,045	241,2	0,016	258,9
Argentina	0,063	180,7	0,045	213,7	0,016	231,1
Norway	0,065	259,3	0,046	213,9	0,016	231,0

Barcelona Spain	Observed - predicted [m]		
	Std.dev.	Min. diff.	Max. diff.
Germany	0,390	-0,380	0,670
Spain	0,095	-0,272	0,355
New Zealand			
Argentina	0,086	-0,316	0,463
Norway	0,097	-0,378	0,552



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# EXAMPLE: LYTTTELTON AND BUENOS AIRES



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Organization

Lyttelton New Zealand	Number of constituents	
	Resolvable	Significant
Germany	89	12
Spain		
New Zealand	60	20
Argentina		31
Norway	59	35

Lyttelton New Zealand	SA		M2		S2	
	Amplitude	Phase	Amplitude	Phase	Amplitude	Phase
Germany	-	-	0,830	125,9	0,058	149,9
Spain						
New Zealand	-	-	0,861	125,0	0,057	149,6
Argentina	0,057	14,3	0,861	125,2	0,057	149,7
Norway			0,860	137,9	0,057	150,3

Buenos Aires Argentina	Number of constituents	
	Resolvable	Significant
Germany	97	21
Spain		
New Zealand	68	16
Argentina		99
Norway		

Buenos Aires Argentina	SA		M2		S2	
	Amplitude	Phase	Amplitude	Phase	Amplitude	Phase
Germany	0,098	63,6	0,282	206,4	0,043	314,6
Spain						
New Zealand	-	-	0,270	119,1	0,039	2,1
Argentina	0,064	336,3	0,259	294,7	0,047	41,6
Norway						



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# EXAMPLE: HAMBURG AND OSLO



International  
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Organization

Hamburg Germany	Number of constituents	
	Resolvable	Significant
Germany		
Spain	241	152
New Zealand	68	26
Argentina		142
Norway	68	49

Hamburg Germany	SA		M2		S2	
	Amplitude	Phase	Amplitude	Phase	Amplitude	Phase
Germany	0,060	338,3	1,582	85,5	0,367	163,6
Spain						
New Zealand	-	-	1,615	110,8	0,370	190,3
Argentina	0,064	261,8	1,585	85,2	0,367	163,2
Norway	0,067	339,0	1,583	85,8	0,366	163,9

Oslo Norway	Number of constituents	
	Resolvable	Significant
Germany	97	32
Spain	232	61
New Zealand	68	14
Argentina		38
Norway	68	31

Oslo Norway	SA		M2		S2	
	Amplitude	Phase	Amplitude	Phase	Amplitude	Phase
Germany	0,092	319,5	0,152	125,8	0,035	70,1
Spain	0,097	320,3	0,146	125,2	0,035	71,5
New Zealand	0,103	295,9	0,145	100,9	0,035	284,3
Argentina	0,075	252,6	0,142	126,5	0,033	73,8
Norway	0,097	320,7	0,146	125,9	0,035	72,0

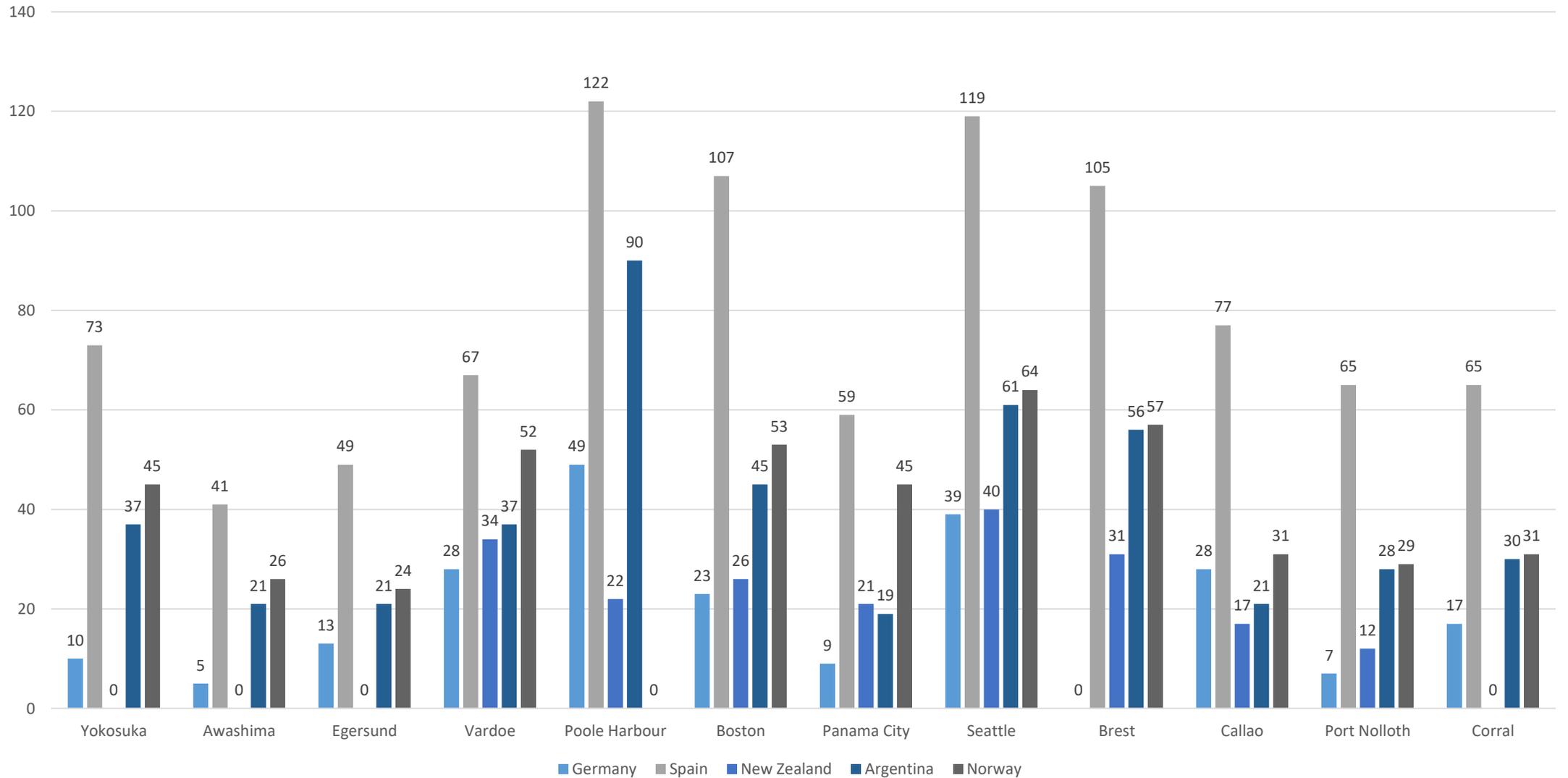


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# NUMBER OF SIGNIFICANT CONSTITUENTS VARIES



International Hydrographic Organization





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# FIRST IMPRESSIONS



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Organization

- Main constituents are very similar 😊
- Number of constituents used and found significant varies
- Methods and type of constituents differs
- HAT/LAT and predictions will therefore differ



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**CHALLENGING WORK**



International  
Hydrographic  
Organization

- Detailed analysis and reports have been provided for an impressive number of series – thank you!
  - Handling different formats, time zones, missing meta data, ...
  - Time consuming to analyse and make all the impressive reports
- Comparing different reports and results
  - How to «compare tidal predictions»
  - The variation in constituents
  - Comparing output of predictions or tide tables



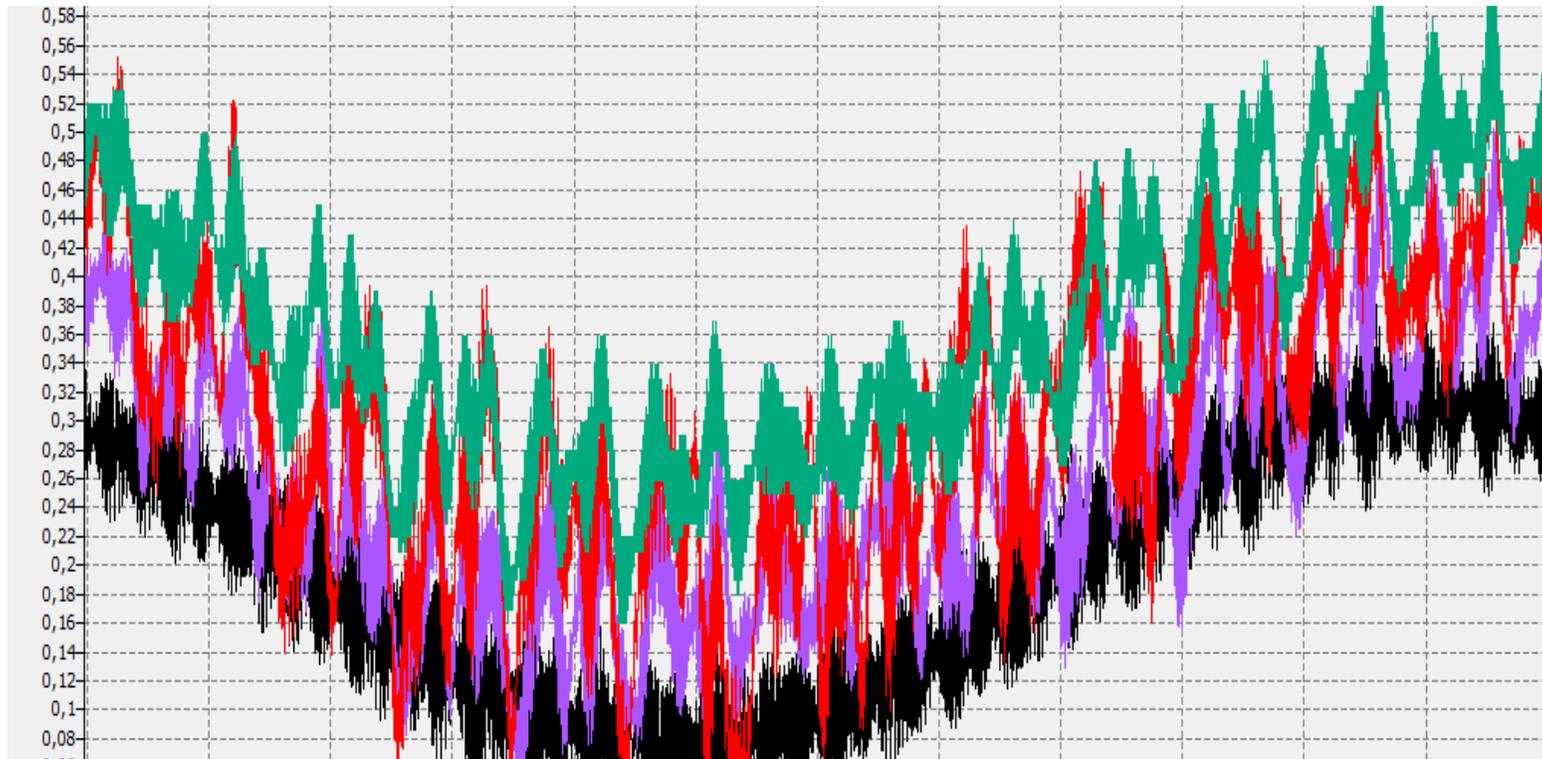
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# COMPARING PREDICTIONS FOR NORWAY



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Organization

- Large differences, mainly due to long-periodical constituents
- Variation in short-periodical constituents for Vardø



Predictions for Egersund by:





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## FURTHER WORK COULD BE



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Organization

- Analysis from more countries
  - Reports from USA are on their way
- Better way of comparing
  - Define scope or parameters to compare
  - Enter key input to common document/report?
  - Should be easy to include more results
- «Native» country could compare predictions for their series
  - Local knowledge
  - Compare to best available set/prediction
  - Validate or evaluate the predictions against other observations
- Similar approach for tidal streams/current
  - Need someone familiar with this to lead the work



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# BACKGROUND TABLES



International  
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## Overview of available reports

		Germany	Spain	New Zealand	Argentina	Norway
Common data sets	# results	18	18	14	21	17
Buenos Aires	3	1	0	1	1	0
Altimetry Argentina	2	1	0	0	1	0
Lyttelton	4	1	0	1	1	1
Yokosuka	4	1	1	0	1	1
Awashima	4	1	1	0	1	1
Egersund	4	1	1	0	1	1
Oslo	5	1	1	1	1	1
Vardoe	5	1	1	1	1	1
Barcelona	5	1	1	1	1	1
Poole Harbour	4	1	1	1	1	0
Boston	5	1	1	1	1	1
Panama City	5	1	1	1	1	1
Seattle	5	1	1	1	1	1
Brest	4	0	1	1	1	1
Callao	5	1	1	1	1	1
Hamburg	4	0	1	1	1	1
Cuxhaven	3	0	1	0	1	1
Ilha Fiscal	4	1	1	1	1	0
Port Nolloth	5	1	1	1	1	1
Corral	4	1	1	0	1	1
Punta Arenas	2	1	0	0	1	0
Coruna	2	0	1	0	0	1
Saint Malo	1	0	1	0	0	0

## Number of significant constituents

	Germany	Spain	New Zealand	Argentina	Norway
Buenos Aires	21		16	99	
Altimetry (ARG)	5			18	
Lyttelton	12		20	31	35
Yokosuka	10	73		37	45
Awashima	5	41		21	26
Egersund	13	49		21	24
Oslo	32	61	14	38	31
Vardoe	28	67	34	37	52
Barcelona	29	62	20	10	50
Poole Harbour	49	122	22	90	
Boston	23	107	26	45	53
Panama City	9	59	21	19	45
Seattle	39	119	40	61	64
Brest		105	31	56	57
Callao	28	77	17	21	31
Hamburg		152	26	142	49
Cuxhaven		134		96	52
Ilha Fiscal	33	61	26		
Port Nolloth	7	65	12	28	29
Corral	17	65		30	31
Punta Arenas	26			55	
Coruna		88			56
Saint Malo		88			