f071delil[001-013]: DELILAH (DUCK, North Carolina, USA)

NOTE: The records of the Samson array (Figure 1) are 2 hours 16 mins long, taken every 3 hours. The records of the primary cross-shore array are 30 mins long, taken every 30 mins. This may explain the relatively large differences in integral wave parameters in the data. The data of Delilah should therefore be considered with care. In total 13 sub-cases are computed.

Purpose

The purpose of this test is to verify the wave model in a near-shore field experiment with depth-induced breaking.

Situation

The FRF (**F**ield **R**esearch **F**acility) is located at the Atlantic Ocean near the town of Duck, North Carolina, USA. The 560m long pier is central to the facility (see Birkemeier et al., 1997). The bathymetry of the beach at Duck is characterised by a constantly changing sandbar. The gauges of the DELILAH (**D**uck **E**xperiment on **L**ow-frequency and **I**ncident-band **L**ongshore and **A**cross-shore **H**ydrodynamics) are located north of the FRF pier, open to storm waves from the northeast, and in an area with typically shore parallel contours (Figure 1). The southern end of the gauges area is in the shadow zone of the FRF pier for waves approaching from south-east. From the measurement data 13 different cases have been selected. The wind field and water levels are assumed homogeneous in the area. These are quantified in the Model Commands **Error! Reference source not found.**. Ambient currents are absent.

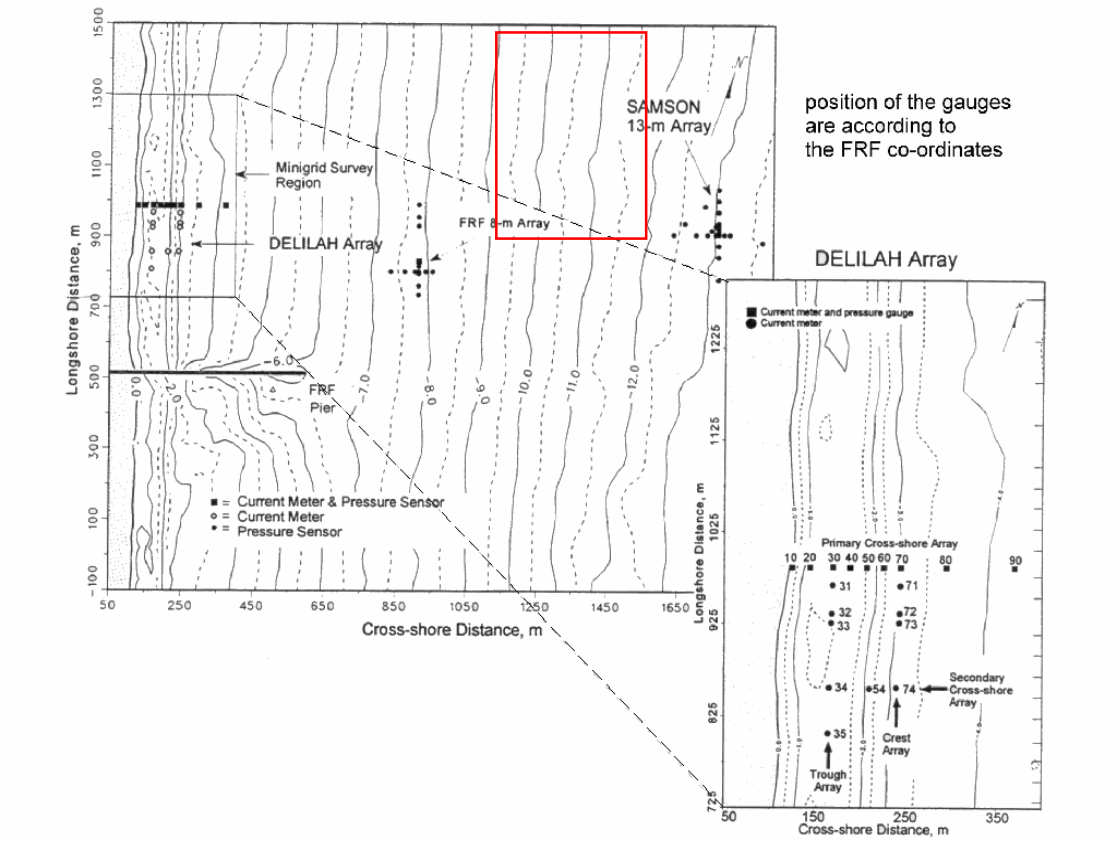

Figure 1 Bathymetry of the FRF area with the locations of the DELILAH and SAMSON gauges. Picture taken from the Homepage of the U.S. Army Corps of Engineers.

Comparison

Comparisons are made with data from nine DELILAH pressure gauges (numbers 10 : 90).

Default model commands

	COMPUTATIONAL GRID							
	1D/2D	XPC	YPC	ALPC	XLENC	YLENC		
	2D	1128.6	-1597.4	20	1700	5000		
	ΔX	ΔY	DIR1	DIR2	Δθ	FLOW	FHIGH	MSC
	12.5	100	0°	360°	10°	0.0444	0.6	53
	PHYSICS							
	GEN	BREAK	FRIC	TRIADS	QUAD	WCAP	REFRAC	FSHIFT	SETUP
	3	on	on	on	on	on	on	off	off
	BOUNDARY CONDITIONS							
	TYPE	BOU	C/V	P/R		NAME OF FILE		
0001	side	NE	con	read boundary from file		'f071delil001.bnd'		
002	side	NE	con	read boundary from file		'f071delil002.bnd'		
003	side	NE	con	read boundary from file		'f071delil003.bnd'		
004	side	NE	con	read boundary from file		'f071delil004.bnd'		
005	side	NE	con	read boundary from file		'f071delil005.bnd'		
006	side	NE	con	read boundary from file		'f071delil006.bnd'		
007	side	NE	con	read boundary from file		'f071delil007.bnd'		
008	side	NE	con	read boundary from file		'f071delil008.bnd'		
009	side	NE	con	read boundary from file		'f071delil009.bnd'		
010	side	NE	con	read boundary from file		'f071delil010.bnd'		
011	side	NE	con	read boundary from file		'f071delil011.bnd'		
012	side	NE	con	read boundary from file		'f071delil012.bnd'		
013	side	NE	con	read boundary from file		'f071delil013.bnd'		

	BOTTOM:	**WIND:**		**DATE & TIME (UTC):**	**WATER LEVEL:**
001	'f071delil001.bot'	U_{10}: 7.06 m/s	θ_W: 110°	06/10/1990 16:00	-0.46 m
002	'f071delil002.bot'	U_{10}: 1.38 m/s	θ_W: 236°	07/10/1990 13:00	-0.29 m
003	'f071delil003.bot'	U_{10}: 7.37 m/s	θ_W: 141°	09/10/1990 10:00	0.63 m
004	'f071delil004.bot'	U_{10}: 6.92 m/s	θ_W: 136°	09/10/1990 13:00	0.35 m
005	'f071delil005.bot'	U_{10}: 12.58 m/s	θ_W: 135°	11/10/1990 01:00	0.42 m
006	'f071delil006.bot'	U_{10}: 4.84 m/s	θ_W: 129°	12/10/1990 01:00	0.53 m
007	'f071delil007.bot'	U_{10}: 3.78 m/s	θ_W: 71°	12/10/1990 13:00	0.77 m
008	'f071delil008.bot'	U_{10}: 7.44 m/s	θ_W: 115°	12/10/1990 19:00	-0.05 m
009	'f071delil009.bot'	U_{10}: 4.87 m/s	θ_W: 128°	12/10/1990 22:00	0.02 m
010	'f071delil010.bot'	U_{10}: 3.12 m/s	θ_W: 142°	13/10/1990 04:00	0.59 m
011	'f071delil011.bot'	U_{10}: 2.22 m/s	θ_W: 68°	13/10/1990 13:00	0.57 m
012	'f071delil012.bot'	U_{10}: 2.72 m/s	θ_W: 144°	13/10/1990 16:00 (*)	0.11 m
013	'f071delil013.bot'	U_{10}: 7.11 m/s	θ_W: 223°	15/10/1990 01:00	0.07 m

(*) Time of case f071delil012 is an 'educated guess'.

References

Birkemeier, W.A., C. Donoghue, C.E. Long, K.K. Hathaway, C.F. Baron, 1997: 1990 DELILAH Nearshore experiment: Summary Report

Acknowledgements

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