WEC-AUV Model Sources

December 2025

Data Files

File:	Description:
Alaska_Wave_Hindcast.csv	Time series of wave property hindcast at 54.040188 N, 160.49251 W during 2010 [1].
Atlantic_Wave_Hindcast.csv	Time series of wave property hindcast at 24.382 N, 80.643 W during 2010 [2], [3].
Hawaii_Wave_Hindcast.csv	Time series of wave property hindcast at 18.333422 N, 155.75226 W during 2010 [4].
NorthPacific_Wave_Hindcast.csv	Time series of wave property hindcast at 18.909367 N, 155.68097 W during 2010 [4].
Oregon_Wave_Hindcast.csv	Time series of wave property hindcast at 46.1998 N, 124.202 W during 2010 [5].
RM3_Power_Matrix_SAM.csv	Example power matrix from the DOE's Water Power Technology Office's (WPTO) US Wave Dataset accessed on the 23 October 2025 from https://registry.opendata.aws/wpto-pds-us-wave.
RM3_seaState_Power.mat	Modeled time series of power generation of a two-body floating point absorber WEC at the PacWave South test site in different sea states. [6].
powerMatrixTestData.mat	Time series of wave properties pulled from the 'Oregon_Wave_Hindcast.csv' datafile.

Property Values

Table 1: Efficiencies

Description	Default Value
Losses associated with battery charge and discharge	0.9 [6]
Generator losses	0.8 [6], [7]
Hydrodynamic efficiency, with B equal to the WEC characteristic dimension. Default value is 0.755.	$1.3\,B + 5.6$. [8]
Cabled power transfer efficiency, applies to the WEC - central storage connection, AUV dock - central storage connection, and the charging connection for most AUVs.	0.9 [9]
Wireless power transfer efficiency, applies to the charging connection for some AUVs	0.50 [10]

Table 2: AUV Specifications

AUV	Mass [kg]	Mission Length [h]	Battery Capacity [kWh]	Recharge Time [h]	Recharge Method	Hotel Load [W]	Model Based On...
A	27	8	0.8	5	wired	90	Iver 3 [7]
B	38.5	14	0.8	5	wired	90	Iver 3 [7]
C	38.6	10	1.5	6	wired	90	Remus 100 [7]
D	58.5	20	3	6	wired	2*	Remus 300 [11]
E	70.3	30	4.5	6	wired	3*	Remus 300 [11]
F	210	42	9.6	8	wired	8*	Remus 620 [11]
G	279	80	19.3	10	wired	11*	Remus 620 [11]
H	347	110	28.9	12	wired	14*	Remus 620 [11]
I	1,630	25	17.55	24	wired	65*	Remus 6000 [11]
J	70	8	1.9	6	wired	3*	Bluefin 9 [12]
K	250	36	7.6	6	wired	10*	Bluefin 12 [13]
L	750	25	13.5	6	wired	30*	Bluefin 21 [14]
M	72.6	3.5	1.5	6	wired	3*	Bluefin HAUV [15]
N	2,200	72	62.5	8	wired	88*	Hugin Superior [16], [17]
O	8,000	360	400	8	wired	320*	Hugin Endurance [18], [19]
P	1,000	24	24	8	wired	40*	Hugin 3000 [20]
Q	1,550	74	48	8	wired	62*	Hugin 4500 [20]
R	25	10	0.6	5	wired	1	Boxfish [21]
S	28	10	0.6	4	wireless	1	Boxfish ARV-i [22], [23]
T	650	10.8	12	3.64	wired	26*	Saab Sabertooth [24], [25]
U	1,300	21.6	30	9.09	wired	52*	Saab Sabertooth [24], [26]

*Extrapolated from the Boxfish AUV hotel load.

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