The Use of High Frequency Radar Data with Models
Summary Chart and Bibliography

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Reference	Location	Data Collection Year(s)	# Months Analyzed	Data Type	Model	DA Method
1	Monterey Bay	1994	<1	totals	other	nudging
2	Monterey Bay	1994	<1	totals	other	nudging
3	Norway west coast	2000	<2	totals	POM	(quasi) EKF
4	Oregon	1998	1	totals	POM	OI,SAS
5	Oregon	1999	2	totals	POM	none
6	Oregon	1997-1998	8	totals	other	inverse
7	Oregon	1998	3	totals	other	inverse
8	Monterey Bay area	1999-2000	4	totals	ICON (POM)	PSAS
9	Oregon	2001	<2	totals	POM	OI
10	Mid-Atlantic Bight	2001	<1	totals	ROMS	nudging, melding
11	Oregon and N. California coast	2004	24	totals	NCEP NAM	none
12	New York Bight, Block Island Sound	2001	12	totals, radials	POM	none
13	West Florida Shelf	2005	12	radials	ROMS	EKF
14	West Florida Shelf	2004-2006	24	radials	ROMS	EKF
15	New York Harbor	2007	4	totals	NYHOPS	nudging
16	Coastal ocean near San Diego	2003-2004	<1	radials	MITgcm	4D-Var
17	Columbia River Plume	2004	2.5	totals	ROMS	None
18	Monterey Bay area	2003	1	totals, radials	ICON (POM)	KF, PSAS
19	UK east coast near Holderness	1995-1996	<1	spectra	SWAN	EKF, OI, 3D-Var
20	Oregon	2001	6	totals	ROMS	none
21	Norwegian coast	2000	<2	totals	HAMSOM	(quasi) EKF
22	German Bight	1991	1	totals	GETM	Ensemble DA
23	Raritan Bay, NY/NJ coast	2007	<2	totals	NYHOPS	nudging, Newtonian damping
24	Mid-Atlantic Bight	2010	2	totals	NYHOPS	none
25	Oregon	2008	2	totals	ROMS	4D-Var
26	Gult of Trieste (N. Adriatic Sea)	2011-2012	20	totals	NAPOM	none
27	North Western Mediterranean Sea	2011	1	radials	GLAZUR64 (NEMO)	none
28	Rhode Island Sound	2004-2009	72	totals (tidal ellipses only)	ROMS	none

Reference	Location	Data Collection Year(s)	# Months Analyzed	Data Type	Model	DA Method
29	Mid-Atlantic Bight	2010-2011	12	totals	HYCOM, NCOM, MERCATOR, COAWST, UMassHOPS,NYHOPS, ESPreSSO	4D-Var (only ESPreSSO)
30	Gulf of Mexico	2010	8	radials	NCOM	2D-Var
31	North Western Mediterranean Sea	2012	1	totals	GLAZUR64 (NEMO)	LAVA
32	Oregon	2007-2008	12	totals	ROMS	none
33	North Western Mediterranean sea	2011	1	radials	ROMS	EnPS
34	Yellow Sea near Qingdao, China	2012	1	totals	HAMSOM	OI
35	Galway Bay	2011	1	totals	EFDC	none
36	Hawaii	2011-2012	19	radials	ROMS	4D-Var
37	Norwegian coast	2013	<3	totals	ROMS	4D-Var
38	German Bight	2011	3	radials	GETM	STOI, KF
39	southern Tyrrhenian Sea	2010	3	totals	ROMS	4D-Var
40	East Australian Current region	2012-2013	22	radials	ROMS	4D-Var
41	Ebro Delta (NW Mediterranean)	2014	12	totals	IBIOFS (CMEMS,NEMO)	none
42	Strait of Gibraltar	2013-2014	20	totals	SAMPA (MITgcm)	none
43	Ligurian Sea, Mediterranean Sea	2010	<2	radials	ROMS	ETKF
44	Northwest European Continental Shelf, north of Scotland around Orkney and Shetland Islands	2013-2014	3	totals	FOAM AMM7	none
45	Adriatic Sea, Mediterranean Sea	2008	9	totals	hybrid of neural network & atmospheric model	none
46	Galway Bay	2013	<1	total	EFDC	nudging
47	Norway	2013	4	total	ROMS	4D-Var
48	California coastal ocean	2009-2014	72	total	ROMS	3D-Var
49	East Australian Current System	2012-2013	2,4	radials	ROMS	4D-Var
50	none (OSSE simulation)		<1	simulated data	ROMS	EAKF
51	none (OSSE simulation)		<1	simulated data	ROMS	EAKF
52	Western Mediterranean Sea	2012-2014	4	totals	ROMS	none
53	U.S. East Coast, offshore of Georgia	2012	1	totals	other	other
55	Hawaii	2007-2017	120	radials	ROMS	4D-Var
56	Oregon-Washington	2011	5	radials	ROMS	En4D-Var
57	Oregon-Washington	2011	1	radials	ROMS	AVRORA 4D-Var
58	East China Sea	2015	1	radials	POMgcs	3D-Var
59	Adriatic Sea	2014-205	12	radials	ROMS	4D-Var PSAS
60	Oregon–Washington	2011	5	radials	ROMS	En4D-Var, 4D-Var
61	Gulf of Naples, Mediterranean Sea	2010-2012	36	waves	WW3, SWAN	none
62	North-Western Mediterranean Sea	2012-2019	96	radials, totals	GLAZUR (NEMO)	none
63	South of Africa	2020	1	totals	ROMS	4D-Var

Reference	Location	Data Collection Year(s)	# Months Analyzed	Data Type	Model	DA Method
64	Mediterranean Sea, Ibiza Channel	2014	1	radials, totals	WMOP (ROMS)	EnOI
65	Mid-Atlantic Bight	2014-2017	48	totals	ROMS	4D-Var
66	California current system	2017-2019	12	radials	ROMS	4D-Var
67	Andhra Pradesh coast, Bay of Bengal	2016	3	totals	NEMO	other
68	Sunda Strait, Indonesia	2013	3	totals, radials	CMEMS	ETKF
69	Southern California Bight	2017	1	spectra	SWAN, NCOM	4D-Var
70	South China Sea	2017	<1	simulated totals	ROMS	EAKF
71	Southern California Bight	2017	1	spectra	COAMPS, SWAN, NCOM	4D-Var

Models	
CMEMS	Copernicus Marine Environment Monitoring Service
COAMPS	Coupled Ocean / Atmosphere Mesoscale Prediction System
COAWST	Coupled-Ocean-Atmosphere-Wave-Sediment Transport Modeling System
ECOM	Estuarine coastal and ocean model, a shallow water version of POM
EFDC	Environmental Fluid Dynamics Code
ESPreSSO	Experimental System for Predicting Shelf and Slope Optics (based on ROMS)
FOAM AMM7	Forecasting Ocean Assimilation Model Atlantic Margin Model (7 km)
GETM	General Estuarine Transport Model
GLAZUR64	NEMO-based regional high-resolution model
HAMSOM	HAMburg Shelf Ocean Model
HYCOM	Hybrid Coordinate Ocean Model
IBIOFS	Iberia-Biscay-Ireland operational forecast system
ICON	a model based on POM
MERCATOR	Mercator Ocean model
MITgcm	Massachusetts Institute of Technology general circulation model
NAPOM	Northern Adriatic Princeton Ocean Model
NCEP NAM	National Centers for Environmental Prediction North American Mesoscale model
NCOM	Navy Coastal Ocean Model
NEMO	Nucleus for European Modelling of the Ocean
NYHOPS	New York Harbor Observing and Prediction System (based on ECOM,POM)
POM	Princeton Ocean Model
POMgcs	Princeton Ocean Model generalized coordinate system
ROMS	Regional Ocean Modeling System
SAMPA	Sistema Autonomo de Medicion, Prediccion y Alerta
SWAN	Simulating Waves Nearshore
UMassHOPS	University of Massachusetts version of the Harvard Ocean Prediction System
WMOP	Western Mediterranean Operational Model
WW3	WaveWatch III

Data Assimilation Methods	
2D-Var	Two dimensional variational
3D-Var	Three dimensional variational
4D-Var	Four dimensional variational
AVRORA	Advanced Variational Regional Ocean Representer Analyzer
EAKF	Ensemble Adjustment Kalman Filter
EKF	Ensemble Kalman Filter
ETKF	Ensemble Transform Kalman Filter
En	Prefix indicates an ensemble approach
EnPS	Ensemble Perturbation Smoother, nonsequential method
KF	Kalman Filter
LAVA	Lagrangian blending algorithm, a variational method
OI	Optimal Interpolation
PSAS	Physical-space Statistical Analysis System
SAS	Statistical Analysis System
STOI	Spatiotemporal Optimal Interpolation method

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