

Satellite	Acquisition date	Z Tides (IGN 69)	bands	Inter band DT
Sentinel 2	2020 01 10	- 0.34531 m	Band2 – band4	1.05 sec
	2020 01 12	-1.6239 m		
	2020 01 17	1.0733 m		
	2020 02 29	0.38913 m		
	2020 05 24	- 1.1024 m		
	2020 06 13	1.0109 m		

Supplementary Table I :

Acquisition dates ; tide correction ; Sentinel 2 bands used ; time lag between bands.

Supplementary Bibliography

1. Neumann, B.; Vafeidis, A.T.; Zimmermann, J.; Nicholls, R.J. Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding—A Global Assessment. *PLoS ONE* **2015**, *10*, e0118571. [Google Scholar] [CrossRef] [PubMed]
2. CIESIN—Center for International Earth Science Information Network. Gridded Population of the World Version 3 (GPWv3); CIESIN: Palisades, NY, USA, 2005. [Google Scholar]
3. Burkett, V.; Davidson, M. Coastal Impacts, Adaptation, and Vulnerabilities: A Technical Input to the 2012 National Climate Assessment. Cooperative Report to the 2013 National Climate Assessment; Island Press/Center for Resource Economics: Washington, DC, USA, 2012. [Google Scholar]
4. Heege, T.; Bergin, M.; Hartmann, K.; Schenk, K. Satellite Services for Coastal Applications. In *Ocean Solutions, Earth Solutions*; Wright, D.J., Ed.; Esri Press: Redlands, CA, USA, 2016; pp. 357–368. [Google Scholar] [CrossRef]
5. Nicholls, R.J.; Wong, P.P.; Burkett, V.R.; Codignotto, J.O.; Hay, J.E.; McLean, R.F.; Ragoonaden, S.; Woodroffe, C.D. Coastal Systems and Low-Lying Areas. In *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*; Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J., Hanson, C.E., Eds.; Cambridge University Press: Cambridge, UK, 2007; pp. 315–356. [Google Scholar]
6. Klemas, V.V. The Role of Remote Sensing in Predicting and Determining Coastal Storm Impacts. *J. Coast. Res.* **2009**, *256*, 1264–1275. [Google Scholar] [CrossRef]
7. Benveniste, J.; Cazenave, A.; Vignudelli, S.; Fenoglio-Marc, L.; Shah, R.; Almar, R.; Andersen, O.; Birol, F.; Bonnefond, P.; Bouffard, J.; et al. Requirements for a Coastal Hazards Observing System. *Front. Mar. Sci.* **2019**, *6*, 348. [Google Scholar] [CrossRef]

8. Mason, D.C.; Gurney, C.; Kennett, M. Beach Topography Mapping—A Comparison of Techniques. *J. Coast. Conserv.* **2000**, *6*, 113–124. [Google Scholar] [CrossRef]
9. Holman, R.; Haller, M.C. Remote Sensing of the Nearshore. *Ann. Rev. Mar. Sci.* **2013**, *5*, 95–113. [Google Scholar] [CrossRef] [PubMed]
10. Diaz, H.; Almar, R.; Bergsma, E.W.J.; Leger, F. On the Use of Satellite-Based Digital Elevation Models to Determine Coastal Topography. In Proceedings of the IGARSS 2019—2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, Japan, 28 July–2 August 2019. [Google Scholar]
11. Porskamp, P.; Rattray, A.; Young, M.; Ierodiaconou, D. Multiscale and Hierarchical Classification for Benthic Habitat Mapping. *Geosciences* **2018**, *8*, 119. [Google Scholar] [CrossRef]
12. Janowski, L.; Trzcinska, K.; Tegowski, J.; Kruss, A.; Rucinska-Zjadacz, M.; Pocwiardowski, P. Nearshore Benthic Habitat Mapping Based on Multi-Frequency, Multibeam Echosounder Data Using a Combined Object-Based Approach: A Case Study from the Rowy Site in the Southern Baltic Sea. *Remote Sens.* **2018**, *10*, 1983. [Google Scholar] [CrossRef]
13. Mielck, F.; Hass, H.C.; Betzler, C. High-Resolution Hydroacoustic Seafloor Classification of Sandy Environments in the German Wadden Sea. *J. Coast. Res.* **2014**, *298*, 1107–1117. [Google Scholar] [CrossRef]
14. Madricardo, F.; Foglini, F.; Kruss, A.; Ferrarin, C.; Pizzeghello, N.M.; Murri, C.; Rossi, M.; Bajo, M.; Bellafore, D.; Campiani, E.; et al. High Resolution Multibeam and Hydrodynamic Datasets of Tidal Channels and Inlets of the Venice Lagoon. *Sci. Data* **2017**, *4*, 170121. [Google Scholar] [CrossRef]
15. Choi, C.; Kim, D. Optimum Baseline of a Single-Pass In-SAR System to Generate the Best DEM in Tidal Flats. *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.* **2018**, *11*, 919–929. [Google Scholar] [CrossRef]
16. Tateishi, R.; Akutsu, A. Relative DEM Production from SPOT Data without GCP. *Int. J. Remote Sens.* **1992**, *13*, 2517–2530. [Google Scholar] [CrossRef]
17. Almeida, L.P.; Almar, R.; Bergsma, E.W.J.; Berthier, E.; Baptista, P.; Garel, E.; Dada, O.A.; Alves, B. Deriving High Spatial-Resolution Coastal Topography From Sub-Meter Satellite Stereo Imagery. *Remote Sens.* **2019**, *11*, 590. [Google Scholar] [CrossRef]
18. Mason, D.C.; Davenport, I.J.; Robinson, G.J.; Flather, R.A.; McCartney, B.S. Construction of an Inter-Tidal Digital Elevation Model by the “water-Line” Method. *Geophys. Res. Lett.* **1995**, *22*, 3187–3190. [Google Scholar] [CrossRef]
19. Lee, S.K.; Ryu, J.H. High-Accuracy Tidal Flat Digital Elevation Model Construction Using TanDEM-X Science Phase Data. *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.* **2017**, *10*, 2713–2724. [Google Scholar] [CrossRef]
20. Salameh, E.; Frappart, F.; Marieu, V.; Spodar, A.; Parisot, J.P.; Hanquiez, V.; Turki, I.; Laignel, B. Monitoring Sea Level and Topography of Coastal Lagoons Using Satellite Radar Altimetry: The Example of the Arcachon Bay in the Bay of Biscay. *Remote Sens.* **2018**, *10*, 297. [Google Scholar] [CrossRef]

21. Pleskachevsky, A.; Lehner, S.; Heege, T.; Mott, C. Synergy and Fusion of Optical and Synthetic Aperture Radar Satellite Data for Underwater Topography Estimation in Coastal Areas. *Ocean Dyn.* **2011**, *61*, 2099–2120. [Google Scholar] [CrossRef]
22. Lyzenga, D.R. Passive Remote Sensing Techniques for Mapping Water Depth and Bottom Features. *Appl. Opt.* **1978**, *17*, 379. [Google Scholar] [CrossRef] [PubMed]
23. Benny, A.H.; Dawson, G.J. Satellite Imagery as an Aid to Bathymetric Charting in the Red Sea. *Cartogr. J.* **1983**, *20*, 5–16. [Google Scholar] [CrossRef]
24. Jupp, D.L.B.; Mayo, K.K.; Kuchler, D.A.; Claasen, D.V.R.; Kenchington, R.A.; Guerin, P.R. Remote Sensing for Planning and Managing the Great Barrier Reef of Australia. *Photogrammetria* **1985**, *40*, 21–42. [Google Scholar] [CrossRef]
25. Lyzenga, D.R. Remote Sensing of Bottom Reflectance and Water Attenuation Parameters in Shallow Water Using Aircraft and Landsat Data. *Int. J. Remote Sens.* **1981**, *2*, 71–82. [Google Scholar] [CrossRef]
26. Lyzenga, D.R. Shallow-Water Bathymetry Using Combined Lidar and Passive Multispectral Scanner Data. *Int. J. Remote Sens.* **1985**, *6*, 115–125. [Google Scholar] [CrossRef]
27. Alpers, W.; Hennings, I. A Theory of the Imaging Mechanism of Underwater Bottom Topography by Real and Synthetic Aperture Radar. *J. Geophys. Res.* **1984**, *89*, 10529. [Google Scholar] [CrossRef]
28. Colomina, I.; Molina, P. Unmanned Aerial Systems for Photogrammetry and Remote Sensing: A Review. *ISPRS J. Photogramm. Remote Sens.* **2014**, *92*, 79–97. [Google Scholar] [CrossRef]
29. Mancini, F.; Dubbini, M.; Gattelli, M.; Stecchi, F.; Fabbri, S.; Gabbianelli, G.; Mancini, F.; Dubbini, M.; Gattelli, M.; Stecchi, F.; et al. Using Unmanned Aerial Vehicles (UAV) for High-Resolution Reconstruction of Topography: The Structure from Motion Approach on Coastal Environments. *Remote Sens.* **2013**, *5*, 6880–6898. [Google Scholar] [CrossRef]
30. Gonçalves, J.A.; Henriques, R. UAV Photogrammetry for Topographic Monitoring of Coastal Areas. *ISPRS J. Photogramm. Remote Sens.* **2015**, *104*, 101–111. [Google Scholar] [CrossRef]
31. Niethammer, U.; James, M.R.; Rothmund, S.; Travelletti, J.; Joswig, M. UAV-Based Remote Sensing of the Super-Sauze Landslide: Evaluation and Results. *Eng. Geol.* **2012**, *128*, 2–11. [Google Scholar] [CrossRef]
32. Gleyzes, J.P.; Meygret, A.; Fratter, C.; Panem, C.; Baillarin, S.; Valorge, C. SPOT5: System Overview and Image Ground Segment. In *Proceedings of the IGARSS 2003—2003 IEEE International Geoscience and Remote Sensing Symposium*, Toulouse, France, 21–25 July 2003; pp. 300–302. [Google Scholar] [CrossRef]
33. Panagiotakis, E.; Chrysoulakis, N.; Charalampopoulou, V.; Poursanidis, D.; Panagiotakis, E.; Chrysoulakis, N.; Charalampopoulou, V.; Poursanidis, D.

Validation of Pleiades Tri-Stereo DSM in Urban Areas. *ISPRS Int. J. Geo-Inf.* **2018**, *7*, 118. [Google Scholar] [CrossRef]

34. Mason, D.C.; Davenport, I.J. Accurate and Efficient Determination of the Shoreline in ERS-1 SAR Images. *IEEE Trans. Geosci. Remote Sens.* **1996**, *34*, 1243–1253. [Google Scholar] [CrossRef]
35. Mason, D.C.; Davenport, I.J.; Flather, R.A. Interpolation of an Intertidal Digital Elevation Model from Heighted Shorelines: A Case Study in the Western Wash. Estuar. Coast. Shelf Sci. **1997**, *45*, 599–612. [Google Scholar] [CrossRef]
36. Heygster, G.; Dannenberg, J.; Notholt, J. Topographic Mapping of the German Tidal Flats Analyzing SAR Images With the Waterline Method. *IEEE Trans. Geosci. Remote Sens.* **2010**, *48*, 1019–1030. [Google Scholar] [CrossRef]
37. Li, Z.; Heygster, G.; Notholt, J. Intertidal Topographic Maps and Morphological Changes in the German Wadden Sea between 1996–1999 and 2006–2009 from the Waterline Method and SAR Images. *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.* **2014**, *7*, 3210–3224. [Google Scholar] [CrossRef]
38. Touzi, R.; Lopes, A.; Bousquet, P. A Statistical and Geometrical Edge Detector for SAR Images. *IEEE Trans. Geosci. Remote Sens.* **1988**, *26*, 764–773. [Google Scholar] [CrossRef]
39. Niedermeier, A.; Romaneeßen, E.; Lehner, S. Detection of Coastlines in SAR Images Using Wavelet Methods. *IEEE Trans. Geosci. Remote Sens.* **2000**, *38*, 2270–2281. [Google Scholar] [CrossRef]
40. Mallat, S.; Zhong, S. Characterization of Signals from Multiscale Edges. *IEEE Trans. Pattern Anal. Mach. Intell.* **1992**, *14*, 710–732. [Google Scholar] [CrossRef]
41. Xu, Z.; Kim, D.; Kim, S.H.; Cho, Y.K.; Lee, S.G. Estimation of Seasonal Topographic Variation in Tidal Flats Using Waterline Method: A Case Study in Gomso and Hampyeong Bay, South Korea. *Estuar. Coast. Shelf Sci.* **2016**, *183*, 213–220. [Google Scholar] [CrossRef]
42. Sibson, R. A Brief Description of Natural Neighbour Interpolation. In *Interpreting Multivariate Data*; John Wiley & Sons: New York, NY, USA, 1981; pp. 21–36. [Google Scholar]
43. Mason, D.C.; Amin, M.; Davenport, I.J.; Flather, R.A.; Robinson, G.J.; Smith, J.A. Measurement of Recent Intertidal Sediment Transport in Morecambe Bay Using the Waterline Method. *Estuar. Coast. Shelf Sci.* **1999**, *49*, 427–456. [Google Scholar] [CrossRef]
44. Wu, D.; Du, Y.; Su, F.; Huang, W.; Zhang, L. An Improved DEM Construction Method For Mudflats Based on BJ-1 Small Satellite Images: A Case Study on Bohai Bay. *ISPRS Int. Arch. Photogramm. Remote Sens. Spat. Inf. Sci.* **2018**, *1871–1878*. [Google Scholar] [CrossRef]
45. Mason, D.C.; Davenport, I.J.; Flather, R.A.; Gurney, C.; Robinson, G.J.; Smith, J.A. A Sensitivity Analysis of the Waterline Method of Constructing a Digital Elevation Model for Intertidal Areas in ERS SAR Scene of Eastern England. *Estuar. Coast. Shelf Sci.* **2001**, *53*, 759–778. [Google Scholar] [CrossRef]

46. Mason, D.C.; Scott, T.R.; Dance, S.L. Remote Sensing of Intertidal Morphological Change in Morecambe Bay, U.K., between 1991 and 2007. *Estuar. Coast. Shelf Sci.* **2010**, *87*, 487–496. [Google Scholar] [CrossRef]
47. Li, Z. Morphological Development of the German Wadden Sea from 1996 to 2009 Determined with Waterline Method and SAR and Landsat Satellite Images. Ph.D. Thesis, Dept. of Physics and Electrical Engineering, Universität Bremen, Bremen, Germany, 2014. [Google Scholar]
48. Wahl, T.; Haigh, I.D.; Woodworth, P.L.; Albrecht, F.; Dillingh, D.; Jensen, J.; Nicholls, R.J.; Weisse, R.; Wöppelmann, G. Observed Mean Sea Level Changes around the North Sea Coastline from 1800 to Present. *Earth-Sci. Rev.* **2013**, *124*, 51–67. [Google Scholar] [CrossRef]
49. Li, F.K.; Goldstein, R.M. Studies of Multibaseline Spaceborne Interferometric Synthetic Aperture Radars. *IEEE Trans. Geosci. Remote Sens.* **1990**, *28*, 88–97. [Google Scholar] [CrossRef]
50. Simons, M.; Rosen, P. Interferometric Synthetic Aperture Radar Geodesy. In *Treatise on Geophysics*; Schubert, G., Ed.; Elsevier: Amsterdam, The Netherlands, 2007; pp. 391–446. [Google Scholar] [CrossRef]
51. Rosen, P.A.; Hensley, S.; Joughin, I.R.; Li, F.; Madsen, S.N.; Rodriguez, E.; Goldstein, R.M. Synthetic Aperture Radar Interferometry. *IEEE Proc.* **2000**, *88*, 333–382. [Google Scholar] [CrossRef]
52. Moreira, A.; Prats-Iraola, P.; Younis, M.; Krieger, G.; Hajnsek, I.; Papathanassiou, K.P. A Tutorial on Synthetic Aperture Radar. *IEEE Geosci. Remote Sens. Mag.* **2013**, *1*, 6–43. [Google Scholar] [CrossRef]
53. Bamler, R.; Hartl, P. Synthetic Aperture Radar Interferometry. *Inverse Probl.* **1998**, *14*, R1–R54. [Google Scholar] [CrossRef]
54. Bürgmann, R.; Rosen, P.A.; Fielding, E.J. Synthetic Aperture Radar Interferometry to Measure Earth's Surface Topography and Its Deformation. *Annu. Rev. Earth Planet. Sci.* **2000**, *28*, 169–209. [Google Scholar] [CrossRef]
55. Gens, R.; Van Genderen, J.L. Review Article SAR Interferometry—Issues, Techniques, Applications. *Int. J. Remote Sens.* **1996**, *17*, 1803–1835. [Google Scholar] [CrossRef]
56. Won, J.S.; Kim, S.W. ERS SAR Interferometry for Tidal Flat DEM. In *Proceedings of the FRINGE 2003 Workshop*, Frascati, Italy, 1–5 December 2003. [Google Scholar]
57. Zebker, H.A.; Villasenor, J. Decorrelation in Interferometric Radar Echoes. *IEEE Trans. Geosci. Remote Sens.* **1992**, *30*, 950–959. [Google Scholar] [CrossRef]
58. Just, D.; Bamler, R. Phase Statistics of Interferograms with Applications to Synthetic Aperture Radar. *Appl. Opt.* **1994**, *33*, 4361. [Google Scholar] [CrossRef]
59. Gade, M.; Alpers, W.; Melsheimer, C.; Tanck, G. Classification of Sediments on Exposed Tidal Flats in the German Bight Using Multi-Frequency Radar Data. *Remote Sens. Environ.* **2008**, *112*, 1603–1613. [Google Scholar] [CrossRef]

60. Wingham, D.J.; Rapley, C.G.; Griffiths, H. New Techniques in Satellite Altimeter Tracking Systems. In Proceedings of the IGARSS 86 Symposium, Zurich, Switzerland, 8–11 September 1986; pp. 1339–1344. [Google Scholar]
61. Frappart, F.; Calmant, S.; Cauhopé, M.; Seyler, F.; Cazenave, A. Preliminary Results of ENVISAT RA-2-Derived Water Levels Validation over the Amazon Basin. *Remote Sens. Environ.* **2006**, *100*, 252–264. [Google Scholar] [CrossRef]
62. Frappart, F.; Papa, F.; Marieu, V.; Malbeteau, Y.; Jordy, F.; Calmant, S.; Durand, F.; Bala, S. Preliminary Assessment of SARAL/AltiKa Observations over the Ganges-Brahmaputra and Irrawaddy Rivers. *Mar. Geod.* **2015**, *38*, 568–580. [Google Scholar] [CrossRef]
63. Normandin, C.; Frappart, F.; Diepkilé, A.T.; Marieu, V.; Mougin, E.; Blarel, F.; Lubac, B.; Braquet, N.; Ba, A.; Normandin, C.; et al. Evolution of the Performances of Radar Altimetry Missions from ERS-2 to Sentinel-3A over the Inner Niger Delta. *Remote Sens.* **2018**, *10*, 833. [Google Scholar] [CrossRef]
64. Bonnefond, P.; Verron, J.; Aublanc, J.; Babu, K.; Bergé-Nguyen, M.; Cancet, M.; Chaudhary, A.; Crétaux, J.F.; Frappart, F.; Haines, B.; et al. The Benefits of the Ka-Band as Evidenced from the SARAL/AltiKa Altimetric Mission: Quality Assessment and Unique Characteristics of AltiKa Data. *Remote Sens.* **2018**, *10*, 83. [Google Scholar] [CrossRef]
65. Mouw, C.B.; Greb, S.; Aurin, D.; DiGiacomo, P.M.; Lee, Z.; Twardowski, M.; Binding, C.; Hu, C.; Ma, R.; Moore, T.; et al. Aquatic Color Radiometry Remote Sensing of Coastal and Inland Waters: Challenges and Recommendations for Future Satellite Missions. *Remote Sens. Environ.* **2015**, *160*, 15–30. [Google Scholar] [CrossRef]
66. IOCCG. Remote Sensing of Ocean Colour in Coastal, and Other Optically Complex, Waters; Reports of the International Ocean-Colour Coordinating Group, No. 3; Sathyendranath, S., Ed.; IOCCG: Dartmouth, NS, Canada, 2000. [Google Scholar]
67. Capo, S.; Lubac, B.; Marieu, V.; Robinet, A.; Bru, D.; Bonneton, P. Assessment of the Decadal Morphodynamic Evolution of a Mixed Energy Inlet Using Ocean Color Remote Sensing. *Ocean Dyn.* **2014**, *64*, 1517–1530. [Google Scholar] [CrossRef]
68. Petit, T.; Bajjouk, T.; Mouquet, P.; Rochette, S.; Vozel, B.; Delacourt, C. Hyperspectral Remote Sensing of Coral Reefs by Semi-Analytical Model Inversion—Comparison of Different Inversion Setups. *Remote Sens. Environ.* **2017**, *190*, 348–365. [Google Scholar] [CrossRef]
69. Philpot, W.D. Bathymetric Mapping with Passive Multispectral Imagery. *Appl. Opt.* **1989**, *28*, 1569. [Google Scholar] [CrossRef]
70. Maritorena, S.; Morel, A.; Gentili, B. Diffuse Reflectance of Oceanic Shallow Waters: Influence of Water Depth and Bottom Albedo. *Limnol. Oceanogr.* **1994**, *39*, 1689–1703. [Google Scholar] [CrossRef]
71. Lee, Z.; Carder, K.L.; Mobley, C.D.; Steward, R.G.; Patch, J.S. Hyperspectral Remote Sensing for Shallow Waters: 2 Deriving Bottom Depths and Water

- Properties by Optimization. *Appl. Opt.* **1999**, 38, 3831. [Google Scholar] [CrossRef]
72. Albert, A.; Gege, P. Inversion of Irradiance and Remote Sensing Reflectance in Shallow Water between 400 and 800 Nm for Calculations of Water and Bottom Properties. *Appl. Opt.* **2006**, 45, 2331. [Google Scholar] [CrossRef]
 73. Lyzenga, D.R.; Malinas, N.P.; Tanis, F.J. Multispectral Bathymetry Using a Simple Physically Based Algorithm. *IEEE Trans. Geosci. Remote Sens.* **2006**, 44, 2251–2259. [Google Scholar] [CrossRef]
 74. Bramante, J.F.; Raju, D.K.; Sin, T.M. Multispectral Derivation of Bathymetry in Singapore's Shallow, Turbid Waters. *Int. J. Remote Sens.* **2013**, 34, 2070–2088. [Google Scholar] [CrossRef]
 75. Dekker, A.G.; Phinn, S.R.; Anstee, J.; Bissett, P.; Brando, V.E.; Casey, B.; Fearn, P.; Hedley, J.; Klonowski, W.; Lee, Z.P.; et al. Intercomparison of Shallow Water Bathymetry, Hydro-Optics, and Benthos Mapping Techniques in Australian and Caribbean Coastal Environments. *Limnol. Oceanogr. Methods* **2011**, 9, 396–425. [Google Scholar] [CrossRef]
 76. Su, H.; Liu, H.; Heyman, W.D. Automated Derivation of Bathymetric Information from Multi-Spectral Satellite Imagery Using a Non-Linear Inversion Model. *Mar. Geod.* **2008**, 31, 281–298. [Google Scholar] [CrossRef]
 77. Stumpf, R.P.; Holderied, K.; Sinclair, M. Determination of Water Depth with High-Resolution Satellite Imagery over Variable Bottom Types. *Limnol. Oceanogr.* **2003**, 48, 547–556. [Google Scholar] [CrossRef]
 78. Evagorou, E.G.; Mettas, C.; Agapiou, A.; Themistocleous, K.; Hadjimitsis, D.G. Bathymetric Maps from Multi-Temporal Analysis of Sentinel-2 Data: The Case Study of Limassol, Cyprus. *Adv. Geosci.* **2019**, 45, 397–407. [Google Scholar] [CrossRef]
 79. Sagawa, T.; Yamashita, Y.; Okumura, T.; Yamanokuchi, T.; Sagawa, T.; Yamashita, Y.; Okumura, T.; Yamanokuchi, T. Satellite Derived Bathymetry Using Machine Learning and Multi-Temporal Satellite Images. *Remote Sens.* **2019**, 11, 1155. [Google Scholar] [CrossRef]
 80. Gordon, H.R.; Brown, O.B.; Evans, R.H.; Brown, J.W.; Smith, R.C.; Baker, K.S.; Clark, D.K. A Semianalytic Radiance Model of Ocean Color. *J. Geophys. Res. Atmos.* **1988**, 93, 10909–10924. [Google Scholar] [CrossRef]
 81. Lee, Z.; Shang, S.; Qi, L.; Yan, J.; Lin, G. A Semi-Analytical Scheme to Estimate Secchi-Disk Depth from Landsat-8 Measurements. *Remote Sens. Environ.* **2016**, 177, 101–106. [Google Scholar] [CrossRef]
 82. Lee, Z.; Lubac, B.; Werdell, J.; Arnone, R. An Update of the Quasi-Analytical Algorithm (QAA_v5). In *International Ocean Color Group Software Report; IOCCG*; Dartmouth, NS, Canada, 2009; pp. 1–9. [Google Scholar]
 83. Lee, Z.; Hu, C.; Shang, S.; Du, K.; Lewis, M.; Arnone, R.; Brewin, R. Penetration of UV-Visible Solar Radiation in the Global Oceans: Insights from Ocean Color Remote Sensing. *J. Geophys. Res. Ocean.* **2013**, 118, 4241–4255. [Google Scholar] [CrossRef]

84. Vanhellemont, Q.; Ruddick, K. Advantages of High Quality SWIR Bands for Ocean Colour Processing: Examples from Landsat-8. *Remote Sens. Environ.* **2015**, *161*, 89–106. [Google Scholar] [CrossRef]
85. Novoa, S.; Doxaran, D.; Ody, A.; Vanhellemont, Q.; Lafon, V.; Lubac, B.; Gernez, P.; Novoa, S.; Doxaran, D.; Ody, A.; et al. Atmospheric Corrections and Multi-Conditional Algorithm for Multi-Sensor Remote Sensing of Suspended Particulate Matter in Low-to-High Turbidity Levels Coastal Waters. *Remote Sens.* **2017**, *9*, 61. [Google Scholar] [CrossRef]
86. Ilori, C.; Pahlevan, N.; Knudby, A.; Ilori, C.O.; Pahlevan, N.; Knudby, A. Analyzing Performances of Different Atmospheric Correction Techniques for Landsat 8: Application for Coastal Remote Sensing. *Remote Sens.* **2019**, *11*, 469. [Google Scholar] [CrossRef]
87. Bru, D.; Lubac, B.; Normandin, C.; Robinet, A.; Leconte, M.; Hagolle, O.; Martiny, N.; Jamet, C.; Bru, D.; Lubac, B.; et al. Atmospheric Correction of Multi-Spectral Littoral Images Using a PHOTONS/AERONET-Based Regional Aerosol Model. *Remote Sens.* **2017**, *9*, 814. [Google Scholar] [CrossRef]
88. Wettle, M.; Brando, V.E.; Dekker, A.G. A Methodology for Retrieval of Environmental Noise Equivalent Spectra Applied to Four Hyperion Scenes of the Same Tropical Coral Reef. *Remote Sens. Environ.* **2004**, *93*, 188–197. [Google Scholar] [CrossRef]
89. Botha, E.; Brando, V.; Dekker, A.; Botha, E.J.; Brando, V.E.; Dekker, A.G. Effects of Per-Pixel Variability on Uncertainties in Bathymetric Retrievals from High-Resolution Satellite Images. *Remote Sens.* **2016**, *8*, 459. [Google Scholar] [CrossRef]
90. IOCCG. Remote Sensing of Inherent Optical Properties: Fundamentals, Tests of Algorithms, and Applications; Reports of the International Ocean-Colour Coordinating Group, No. 5; Lee, Z., Ed.; IOCCG: Dartmouth, NS, Canada, 2006. [Google Scholar]
91. Lee, Z.; Arnone, R.; Hu, C.; Werdell, P.J.; Lubac, B. Uncertainties of Optical Parameters and Their Propagations in an Analytical Ocean Color Inversion Algorithm. *Appl. Opt.* **2010**, *49*, 369. [Google Scholar] [CrossRef]
92. Bergsma, E.W.J.; Almar, R. Video-Based Depth Inversion Techniques, a Method Comparison with Synthetic Cases. *Coast. Eng.* **2018**, *138*, 199–209. [Google Scholar] [CrossRef]
93. Holland, T.K. Application of the Linear Dispersion Relation with Respect to Depth Inversion and Remotely Sensed Imagery. *IEEE Trans. Geosci. Remote Sens.* **2001**, *39*, 2060–2072. [Google Scholar] [CrossRef]
94. Stockdon, H.F.; Holman, R.A. Estimation of Wave Phase Speed and Nearshore Bathymetry from Video Imagery. *J. Geophys. Res. Ocean.* **2000**, *105*, 22015–22033. [Google Scholar] [CrossRef]
95. Catálan, P.A.; Haller, M.C. Remote Sensing of Breaking Wave Phase Speeds with Application to Non-Linear Depth Inversions. *Coast. Eng.* **2008**, *55*, 93–111. [Google Scholar] [CrossRef]

96. Leu, L.G.; Chang, H.W. Remotely Sensing in Detecting the Water Depths and Bed Load of Shallow Waters and Their Changes. *Ocean Eng.* **2005**, *32*, 1174–1198. [Google Scholar] [CrossRef]
97. Marieu, V.; Guerin, T.; Capo, S.; Bru, D.; Lubac, B.; Hanquiez, V.; Lafon, V.; Bonneton, P. Bathymétrie de l'embouchure Du Bassin d'Arcachon Par Fusion de Données Hétéroclites et Reconstruction Bathymétrique. In Proceedings of the XIIèmes Journées Nationales Génie Côtier—Génie Civil, Cherbourg, France, 12–14 June 2012. [Google Scholar] [CrossRef]
98. Poupardin, A.; Idier, D.; de Michele, M.; Raucoules, D. Water Depth Inversion From a Single SPOT-5 Dataset. *IEEE Trans. Geosci. Remote Sens.* **2016**, *54*, 2329–2342. [Google Scholar] [CrossRef]
99. De Michele, M.; Leprince, S.; Thiébot, J.; Raucoules, D.; Binet, R. Direct Measurement of Ocean Waves Velocity Field from a Single SPOT-5 Dataset. *Remote Sens. Environ.* **2012**, *119*, 266–271. [Google Scholar] [CrossRef]
100. Bergsma, E.W.J.; Almar, R.; Maisongrande, P. Radon-Augmented Sentinel-2 Satellite Imagery to Derive Wave-Patterns and Regional Bathymetry. *Remote Sens.* **2019**, *11*, 1918. [Google Scholar] [CrossRef]
101. Bergsma, E.W.J.; Almar, R.; Maisongrande, P. Radon-Augmentation of Sentinel-II Imagery to Enhance Resolution and Visibility of (Nearshore) Ocean-Wave Patterns. In Proceedings of the IGARSS 2019—2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, Japan, 28 July–2 August 2019. [Google Scholar]
102. Matsuba, Y.; Sato, S. Nearshore Bathymetry Estimation Using UAV. *Coast. Eng. J.* **2018**, *60*, 51–59. [Google Scholar] [CrossRef]
103. Holman, R.A.; Brodie, K.L.; Spore, N.J. Surf Zone Characterization Using a Small Quadcopter: Technical Issues and Procedures. *IEEE Trans. Geosci. Remote Sens.* **2017**, *55*, 2017–2027. [Google Scholar] [CrossRef]
104. Abileah, R. Mapping Shallow Water Depth from Satellite. In Proceedings of the ASPRS Annual Conference, Reno, NV, USA, 1–5 May 2006. [Google Scholar]
105. McCarthy, B.L. Coastal Bathymetry Using 8-Color Multispectral Satellite Observation of Wave Motion; Naval Postgraduate School: Monterey, CA, USA, 2010. [Google Scholar]
106. Myrick, I.I.; Kenneth, B. Coastal Bathymetry Using Satellite Observation in Support of Intelligence Preparation of the Environment; Naval Postgraduate School: Monterey, CA, USA, 2011. [Google Scholar]
107. Almar, R.; Bergsma, E.W.J.; Maisongrande, P.; de Almeida, L.P.M. Wave-Derived Coastal Bathymetry from Satellite Video Imagery: A Showcase with Pleiades Persistent Mode. *Remote Sens. Environ.* **2019**, *231*, 111263. [Google Scholar] [CrossRef]
108. Almar, R.; Bergsma, E.W.J.; Maisongrande, P.; Giros, A.; Almeida, L.P. On the Application of a Two-Dimension Spatio-Temporal Cross-Correlation Method to Inverse Coastal Bathymetry from Waves Using a Satellite-Based

- Video Sequence. In Proceedings of the IGARSS 2019—2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, Japan, 28 July–2 August 2019. [Google Scholar]
109. Pereira, P.; Baptista, P.; Cunha, T.; Silva, P.A.; Romão, S.; Lafon, V. Estimation of the Nearshore Bathymetry from High Temporal Resolution Sentinel-1A C-Band SAR Data—A Case Study. *Remote Sens. Environ.* **2019**, *223*, 166–178. [Google Scholar] [CrossRef]
 110. Brusch, S.; Held, P.; Lehner, S.; Rosenthal, W.; Pleskachevsky, A. Underwater Bottom Topography in Coastal Areas from TerraSAR-X Data. *Int. J. Remote Sens.* **2011**, *32*, 4527–4543. [Google Scholar] [CrossRef]
 111. Mishra, M.K.; Ganguly, D.; Chauhan, P. Estimation of Coastal Bathymetry Using RISAT-1 C-Band Microwave SAR Data. *IEEE Geosci. Remote Sens. Lett.* **2014**, *11*, 671–675. [Google Scholar] [CrossRef]
 112. Bian, X.; Shao, Y.; Tian, W.; Wang, S.; Zhang, C.; Wang, X.; Zhang, Z.; Bian, X.; Shao, Y.; Tian, W.; et al. Underwater Topography Detection in Coastal Areas Using Fully Polarimetric SAR Data. *Remote Sens.* **2017**, *9*, 560. [Google Scholar] [CrossRef]
 113. Holman, R.; Plant, N.; Holland, T. CBathy: A Robust Algorithm for Estimating Nearshore Bathymetry. *J. Geophys. Res. Ocean.* **2013**, *118*, 2595–2609. [Google Scholar] [CrossRef]
 114. Bergsma, E.W.J.; Conley, D.C.; Davidson, M.A.; O'Hare, T.J. Video-Based Nearshore Bathymetry Estimation in Macro-Tidal Environments. *Mar. Geol.* **2016**, *374*, 31–41. [Google Scholar] [CrossRef]
 115. Chénier, R.; Faucher, M.A.; Ahola, R.; Shelat, Y.; Sagram, M.; Chénier, R.; Faucher, M.A.; Ahola, R.; Shelat, Y.; Sagram, M. Bathymetric Photogrammetry to Update CHS Charts: Comparing Conventional 3D Manual and Automatic Approaches. *ISPRS Int. J. Geo-Inf.* **2018**, *7*, 395. [Google Scholar] [CrossRef]
 116. Chapter 3: Interpreting Stereoscopic Images—Water Exploration: Remote Sensing Approaches. Available online: <https://h2oexplore.wordpress.com/chapter-3-interpreting-stereoscopic-images/> (accessed on 31 July 2019).
 117. Donlon, C.; Berruti, B.; Buongiorno, A.; Ferreira, M.H.; Féménias, P.; Frerick, J.; Goryl, P.; Klein, U.; Laur, H.; Mavrocordatos, C.; et al. The Global Monitoring for Environment and Security (GMES) Sentinel-3 Mission. *Remote Sens. Environ.* **2012**, *120*, 37–57. [Google Scholar] [CrossRef]
 118. Scharroo, R.; Bonekamp, H.; Ponsard, C.; Parisot, F.; von Engeln, A.; Tahtadjiev, M.; de Vriendt, K.; Montagner, F. Jason Continuity of Services: Continuing the Jason Altimeter Data Records as Copernicus Sentinel-6. *Ocean Sci.* **2016**, *12*, 471–479. [Google Scholar] [CrossRef]
 119. Markus, T.; Neumann, T.; Martino, A.; Abdalati, W.; Brunt, K.; Csatho, B.; Farrell, S.; Fricker, H.; Gardner, A.; Harding, D.; et al. The Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2): Science Requirements, Concept, and

- Implementation. *Remote Sens. Environ.* **2017**, *190*, 260–273. [Google Scholar] [CrossRef]
120. Abdalati, W.; Zwally, H.J.; Bindenschadler, R.; Csatho, B.; Farrell, S.L.; Fricker, H.A.; Harding, D.; Kwok, R.; Lefsky, M.; Markus, T.; et al. The ICESat-2 Laser Altimetry Mission. *Proc. IEEE* **2010**, *98*, 735–751. [Google Scholar] [CrossRef]
121. Popescu, S.C.; Zhou, T.; Nelson, R.; Neuenschwander, A.; Sheridan, R.; Narine, L.; Walsh, K.M. Photon Counting LiDAR: An Adaptive Ground and Canopy Height Retrieval Algorithm for ICESat-2 Data. *Remote Sens. Environ.* **2018**, *208*, 154–170. [Google Scholar] [CrossRef]
122. Catalão, J.; Nico, G. Multitemporal Backscattering Logistic Analysis for Intertidal Bathymetry. *IEEE Trans. Geosci. Remote Sens.* **2017**, *55*, 1066–1073. [Google Scholar] [CrossRef]
123. Ceyhun, Ö.; Yalçın, A. Remote Sensing of Water Depths in Shallow Waters via Artificial Neural Networks. *Estuar. Coast. Shelf Sci.* **2010**, *89*, 89–96. [Google Scholar] [CrossRef]
124. Gholamalifard, M.; Kutser, T.; Esmaili-Sari, A.; Abkar, A.; Naimi, B.; Gholamalifard, M.; Kutser, T.; Esmaili-Sari, A.; Abkar, A.A.; Naimi, B. Remotely Sensed Empirical Modeling of Bathymetry in the Southeastern Caspian Sea. *Remote Sens.* **2013**, *5*, 2746–2762. [Google Scholar] [CrossRef]
125. Liu, S.; Gao, Y.; Zheng, W.; Li, X. Performance of Two Neural Network Models in Bathymetry. *Remote Sens. Lett.* **2015**, *6*, 321–330. [Google Scholar] [CrossRef]
126. Misra, A.; Vojinovic, Z.; Ramakrishnan, B.; Luijendijk, A.; Ranasinghe, R. Shallow Water Bathymetry Mapping Using Support Vector Machine (SVM) Technique and Multispectral Imagery. *Int. J. Remote Sens.* **2018**, *39*, 4431–4450. [Google Scholar] [CrossRef]
127. Vojinovic, Z.; Abebe, Y.A.; Ranasinghe, R.; Vacher, A.; Martens, P.; Mandl, D.J.; Frye, S.W.; van Ettinger, E.; de Zeeuw, R. A Machine Learning Approach for Estimation of Shallow Water Depths from Optical Satellite Images and Sonar Measurements. *J. Hydroinformat.* **2013**, *15*, 1408–1424. [Google Scholar] [CrossRef]
128. Wang, L.; Liu, H.; Su, H.; Wang, J. Bathymetry Retrieval from Optical Images with Spatially Distributed Support Vector Machines. *GISci. Remote Sens.* **2019**, *56*, 323–337. [Google Scholar] [CrossRef]
129. Manessa, M.D.M.; Kanno, A.; Sekine, M.; Haidar, M.; Yamamoto, K.; Imai, T.; Higuchi, T. Satellite-Derived Bathymetry Using Random Forest Algorithm and Worldview-2 Imagery. *Geoplan. J. Geomat. Plan.* **2016**, *3*, 117. [Google Scholar] [CrossRef]
130. Zhu, Z.; Wulder, M.A.; Roy, D.P.; Woodcock, C.E.; Hansen, M.C.; Radeloff, V.C.; Healey, S.P.; Schaaf, C.; Hostert, P.; Strobl, P.; et al. Benefits of the Free and Open Landsat Data Policy. *Remote Sens. Environ.* **2019**, *224*, 382–385. [Google Scholar] [CrossRef]

131. Morrow, R.; Fu, L.L.; Ardhuin, F.; Benkiran, M.; Chapron, B.; Cosme, E.; d'Ovidio, F.; Farrar, J.T.; Gille, S.T.; Lapeyre, G.; et al. Global Observations of Fine-Scale Ocean Surface Topography With the Surface Water and Ocean Topography (SWOT) Mission. *Front. Mar. Sci.* **2019**, *6*, 232. [Google Scholar] [CrossRef]