**Supplementary Materials**

Table 1 Abbreviation or symbols

|  |  |
| --- | --- |
| Abbreviation or symbols | Abbreviation or symbols |
| AbpmADEOSABsAFAI$$a\_{w}$$AC$$b\_{bp}\left(λ\right)$$BBHRBPNNCNKICOCTSChlaCZCSCDOMCOMSCont Shelf ResCNN-TLCBI$$k\_{d}$$DOCDB-SFNetEarth-Sci RevESTARFMEnviron Res CommunEnviron Sci Pollut ResESAFACFLHGABIGLIGLIMRGOCSTGOCSHABsIEEE T-GRSIGAGIndian J Geo-Mar Sci | Adsorption Based Productivity ModelAdvanced Earth Observation SatelliteAlgal bloomsAlternative floating algae indexAssumption of the pure water absorptionAtmospheric correctionBackscattering coefficientsBio-optical hyperspectral reconstructionBP neural networkChina National Knowledge InfrastructureChinese Ocean Color and Temperature ScannerChlorophyll aCoastal Zone Color ScannerColored dissolved organic matterCommunication Ocean and Meteorological SatelliteContinental Shelf ResearchConvolutional neural network transfer learning modelCyanobacterial bloom intensityDiffuse attenuation coefficientDissolved organic carbonDual-branch sea fog detection networkEarth-Science ReviewsEnhanced spatial and temporal adaptive reflection fusion modelEnvironmental Research CommunicationsEnvironmental Science and Pollution ResearchEuropean Space AgencyFloating algae coverFluorescence line heightGeneralized algal bloom index algorithmGeneration Global ImagerGeostationary Littoral Imaging and Monitoring RadiometerGeostationary oceancolor satelliteGeostationary oceancolor sensorsHarmful algal bloomsIEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSINGIndex of floating Green Algae for GOCIIndian Journal of Geo-Marine Sciences | MUMMMar Pollut BullMOSMCCMERISMODISMLPNASANIRNPPNDVINMINRTIOCTSOSMIOcean Sci JOEPOCPCPMRISPOLDERRF$$L\_{rc}(λ)$$RIRSRSE$$R\_{rs}(λ)$$Sci Total EnvironSFDDSIASITSSCsSSSSeaWiFSSeaDASSDDSGLI | Management Unit of the North Sea Mathematical ModelsMarine Pollution BulletinMaritime Observation SatelliteMaximum cross-correlationMedium Resolution Imaging Spectrometer InstrumentModerate Resolution Imaging SpectroradiometerMulti-Layer PerceptronNational Aeronautics and Space AdministrationNear-infraredNet primary productionNormalized difference vegetation indexNormalized mutual informationNormalized red tide indexOcean Color and Temperature ScannerOcean Scanning Multispectral ImagerOcean Science JournalOptics EXPRESSParticulate organic carbonPhycocyaninPlayful Magnetic Resonance Imaging SimulatorPolarization and Directionality of the Earth's ReflectancesRandom forestRayleigh-corrected radianceRed tide indexRemote sensingRemote Sensing of EnvironmentRemote sensing reflectanceScience of the Total EnvironmentSea fog data setSea ice areaSea ice thicknessSea surface currentsSea surface salinitySea-viewing Wide Field-of-view SensorSeaWiFS Data Analysis SystemSecchi disk depthSecond Generation Global Imager |
| ICWsJAGInt J Remote SensISPRSJAXAJ Appl Remote SensJ Environ ManageJGRJ Mar Sci EngJ Mar Sci TechJ Quant Spectrosc RaJ Sea ResKorean J Remote SensKOMPSAT-1Limnol OceanogrLCI | Inland and coastal watersInternational Journal of Applied Earth Observation and GeoinformationInternational Journal of Remote SensingISPRS Journal of Photogrammetry and Remote SensingJapan Aerospace Exploration AgencyJournal of Applied Remote SensingJournal of Environmental ManagementJournal of Geophysical Research-OceansJournal of Marine Science and EngineeringJournal of Marine Science and TechnologyJournal of Quantitative Spectroscopy & Radiative TransferJournal of Sea ResearchKorean Journal of Remote Sensing Korea Multi-Purpose Satellite-1Limnology and OceanographyLinear Combination Index | SWIRSERTSMAPSZASpat Inf ResESOASVRSPMSCIGOCIUVVIIRSWRYREYOC | Shortwave infraredSimple semi-empirical radiative transferSoil Moisture Active PassiveSolar zenith angleSpatial Information Research Spectral optimization algorithmSupport vector regressionSuspended particulate matterSynthetic chlorophyll indexThe Geostationary Oceancolor ImagerUltravioletVisible Infrared Imaging RadiometerWater ResearchYalu River estuaryYellow and East China Sea Oceancolor |

Table 2 The number of articles published based on GOCI in the past ten years, the country, the study area, and research direction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Years | Number of published papers | Country | Study Area | Research Directions |
| 20232022202120202019201820172016201520142013201220112010 | 1281391373911101829271151414141112 | USASouth KoreaChinaUSASouth KoreaChinaIndiaSouth KoreaChinaSouth KoreaChinaIndiaSouth KoreaChinaSouth KoreaChinaSouth KoreaChinaSouth KoreaChinaSouth KoreaNetherlandsChinaUSAChinaSouth KoreaChinaChinaSouth KoreaSouth KoreaFranceSouth KoreaChina | ///Lake ChaganHangzhou BayHangzhou BayBohai SeaThe YangtzeYellow Sea/Lake Taihu/Land Surface/Bohai SeaChaohu Lake/Hangzhou BayThe East China SeaTurbid Coastal Waters////Yellow Sea//Yellow Sea The YangtzeLake TaihuTaiwan coastal watersYellow Sea/Eutrophic LakeThe East China SeaTurbid waterTurbid water//Shallow and eutrophic lakesTurbid Coastal WatersLake TaihuTurbid Coastal WatersTurbid Coastal WatersLake TaihuLake TaihuThe East China Sea//Lake TaihuLake TaihuYellow SeaTurbid waterThe East China SeaBohai SeaCoastal and inland watersThe YangtzeYellow SeaJiaozhou Bay/East SeaThe YangtzeYongjiang Estuary/Lake TaihuLake TaihuThe YangtzeYellow SeaBohai Sea/Yellow Sea//Yellow River/Dongping LakeThe YangtzeThe YangtzeLake TaihuYellow SeaYellow Sea/Bohai SeaHighly turbid watersYellow SeaNorth-East Asian/Lake TaihuLake TaihuBohai SeaBohai SeaYellow Sea/The East China SeaThe YangtzeLake TaihuLake TaihuInland WatersLake Taihu/Dongting LakeBohai Sea//The East China SeaBohai Sea/Coastal waters/Coastal watersCoastal watersYellow River EstuaryComplex waters//East SeaBohai Sea/The East China Sea/Turbid inland waters/ | DOCAlgal bloomsRed tideLake iceChlaSPMSPMChlaChlaRed tideAlgal bloomsDecadal MeasurementsAtmospheric reflectivityMachine learningRed tideChlaMachine learningSPMAlgal bloomsSPMNPPSea surface salinitySea surface currentsSea fogAlgal bloomsFLH algorithmChlaSPMSPMPOC SPMAlgal bloomsSea icePOCKdWater reflectanceAtmospheric correctionSea fogChlaWater clarityWater clarityAtmospheric correctionAtmospheric correctionChla ChlaChla/ Algal bloomsChlaChlaSPMSPMSPMAtmospheric correctionAtmospheric correctionAlgal bloomsSea iceHABsPOCSea surface salinityReviewHABsAlgal bloomsSPMSPMSPMAlgal bloomsSPMSPMAlgal bloomsWater clarityGreen tideSPMTurbidityLiterature ReviewChlaAtmospheric correctionCDOMDOCGreen tidePCSea surface currentsSea iceChlaTurbidityChlaTPSPMSea iceTurbidityKdAlgal bloomsAttenuation coefficientChlaAlgal bloomsChla Chla Sea iceTurbidityLiterature ReviewAlgal bloomsSea iceSea surface currentsSPMSedimentSPMSea surface currentsSPMAtmospheric correctionFloating Green AlageAtmospheric correctionCDOMSPMLiterature reviewSPMLiterature reviewChlaAtmospheric correction |