

2021 年《海洋科学》总目次

第 45 卷

研究论文

- 绿鳍马面鲷早期生长发育与摄食特性的研究 张 哲, 姜良龙, 王 臻, 杜荣斌, 吴艳庆, 刘立明(1)1
- 东海自由生活线虫两个新纪录种 孙 静, 黄 勇(1)14
- 大沽河口水位变化特征分析 赖秋宇, 刘子洲, 翟方国, 顾艳镇, 陈 栋, 姜庆岩(1)22
- 春季长江口颗粒有机碳年际分布变化及其影响因素分析 李 倩, 张珊珊, 钱薇微(1)32
- 高氮磷比与酸化共同作用对微小亚历山大藻生长和产毒的影响 郝 爽, 刘丽君, 陈军辉, 何秀平, 连子如(2)1
- 黄河三角洲潮间带大型底栖无脊椎动物群落结构与分布特征
..... 史会剑, 李 玄, 王海艳, 马培振, 张文文, 雍 凡, 崔 鹏, 吴 翼(2)11
- 海南儋州湾红树林区沉积有机质来源及碳储量 褚梦凡, 肖晓彤, 丁 杨, 赵美训(2)22
- 利用 FY-4A 气象卫星观测海洋内波 马志多, 孟俊敏, 孙丽娜, 刘永信(2)32
- 光强对欧洲舌齿鲈稚鱼眼组织基因表达的影响
..... 吴禹濛, 袁 震, 姜洁明, 张 磊, 任星月, 姚安琪, 宋昌斌, 闫红伟, 刘 鹰(2)40
- 大黄鱼脊椎骨及其早期发育研究 黄伟卿, 张 艺, 周逢芳, 阮少江, 林培华, 周振平, 丁建发, 刘家富, 杨俊凡(2)51
- 东营河口浅海贝类生态国家级海洋特别保护区大型底栖动物的群落结构特征
..... 张天文, 郭 文, 荆圆圆, 刘恩孚, 胡凡光, 王树刚, 刘广斌(3)1
- 水体透明度两种半分析反演模型的对比与分析 高 磊, 胡 鹏, 朱金山(3)14
- 温度和微藻饵料对强额孔雀水蚤摄食的影响 程浩楠, 程方平, 王淑红(3)24
- 基于机器学习的青岛市区近岸海雾集成预报方法 高 松, 徐江玲, 刘桂艳, 毕 凡, 张 薇, 白 涛(3)33
- 山东半岛东北部海洋牧场海域冬季海水流动的时空分布特征
..... 胡罗煜, 翟方国, 刘子洲, 李培良, 顾艳镇, 孙利元, 李 欣, 陈 栋, 姜庆岩(4)1
- 微波散射实验识别原油及乳化原油 许晨琪, 过 杰, 杨启霞, 张 晰, 刘根旺, 张彦敏(4)13
- 海面太阳耀斑区的溢油光学遥感 CNN 检测方法研究 杜 凯, 马 毅, 姜宗辰, 杨俊芳(4)22
- 双浮子点吸收式波能转换装置参数研究 王 腾, 李树勃, 肖炜杰, 包兴先(4)31
- 我国海洋捕捞业政策变迁、结构特征及优化研究——基于政策文本的量化分析 史 磊, 宋毅宁, 秦 宏(4)40
- 一种适用于小入射角条件下的白冠海面后向散射模型 曲晓俊, 李 晨, 戴永寿(5)2
- 卫星视频舰船目标检测方法研究 张 驰, 王 朝, 盛 辉(5)9
- 基于多时相遥感数据的海岸线自动提取方法 盛 辉, 张 驰, 万剑华(5)16
- 南海珊瑚岛礁遥感分类体系和解译标志 李晓敏, 马 毅, 吕喜玺(5)23

基于支持向量机预测安达曼海南部内孤立波传播特性	陆可潇, 王 晶, 魏 鑫	(5)31
顾及恶劣海况的船舶救援路径规划	马凯强, 任利锋, 曾 喆, 万剑华	(5)39
基于 COG 的遥感影像地图服务快速构建方法	陈昱行, 盛 辉, 刘善伟, 何亚文	(5)47
三沙湾夏季底边界层动力过程及悬沙输运特征	齐昱恺, 涂俊彪, 于俊杰, 范代读	(6)1
不同植被类型对福建三沙湾潮滩有机碳埋藏的影响	李健成, 吴伊婧, 江彬彬, 苏建锋, 于俊杰, 范代读	(6)13
新近纪深海大洋红层的分布分类及成因	熊梓翔, 朱俊江, 杨国明, 王长盛, 贾仲佳, 欧小林, 李三忠	(6)22
集合变换卡尔曼滤波数据同化方法中的协方差局地化	王际朝, 王 玥, 臧绍东, 杨俊钢, 纪艳菊, 阮宗利	(6)34
温控加热下低表面能铝氧化膜的制备及其耐腐蚀初步研究	郑 萌, 朱庆军, 孙 欣, 刘方浩, 段继周	(6)44
厦门港叶绿素的时空分布及其与水环境因子关系的多元分析	俞秀霞, 孙 琳, 陈长平	(6)49
长三角海洋资源环境一体化治理策略研究——基于海洋生态系统服务价值影响分析	贺义雄, 宋伟鸣, 杨 帆	(6)63
黄渤海海域波浪时空变化特征分析	邱文博, 李冠宇, 徐俊臣, 胡轶群, 王亚丁, 石洪源	(7) 1
基于海岸带成像仪 CZI 的连云港紫菜养殖动态监测	王鑫华, 刘建强, 邢前国, 陈艳拢	(7)9
21 世纪初期海上丝绸之路大陆岸线位置变化特征	宋 洋, 张玉新, 侯西勇	(7)18
基于 SCHISM 模式的全球潮波模拟	涂成东, 纪棋严, 左军成	(7)29
深海锰结核以煤代焦还原熔炼新工艺研究	彭 俊, 周小舟, 沈裕军, 刘 强, 钟 山, 蔡云卓, 黄宗朋	(7)41
不同类型改性粘土去除米氏凯伦藻(<i>Karenia mikimotoi</i>)后絮体中细菌变化特点	丁 玉, 宋秀贤, 曹西华, 俞志明	(7)46
文登区浅层地下水化学演化与海水入侵研究	郭明华, 王 敬, 戴长国, 蒋 雷, 张浩清, 柳 超	(7)57
夏季长江口水体层化和潮汐作用对颗粒氮、磷运移的影响	葛田田, 王新洋, 谭丽菊, 李 铁	(8)1
渤海浮游植物群落结构时空分布及其影响因素	李子琳, 张海彦, 赵 亮, 徐 帆	(8)10
我国海洋资源环境经济复合系统演化研究——基于 Logistic 模型的实证分析	宋泽明, 宁 凌	(8)21
桑托斯盆地地层生热率及热结构研究	孙旭东, 郭兴伟, 郑求根, 温珍河, 张训华, 王锦洲, 李子渊	(9)1
两次卵巢发育成熟拟穴青蟹卵巢与肝胰腺营养成分比较分析	喻国洪, 王扬才, 金中文	(9)12
基于生命周期的区域围填海存量分析方法研究	方 剑, 刘百桥, 刘利东, 黄秋双, 付阳子	(9)21
基于地表水-地下水耦合模型的海底地下淡水排放量估算	罗 璐, 俞 烜, 刘丙军, 陈晓宏	(9)29
风急流对吕宋海峡黑潮路径变异的影响及其动力机制	常 铨, 王 铮, 袁东亮	(10)1
基于无人机遥感的黄海绿潮搁浅生物量估算	尚伟涛, 高志强, 姜晓鹏, 田信鹏, 郭少方	(10)11
黄河三角洲浅层地下水位年内变化特征及影响因素	常茂祥, 史经昊, 叶思源, 王祥东, 李广雪	(10)20
基于 KPCA-RBF 模型的风暴潮灾害经济损失预测	杨雪雪, 刘 强	(10)32
基于北斗卫星船位监控系统数据的南海双拖渔船作业特征研究	于 杰, 周艳波, 唐振朝, 陈国宝, 曾 雷	(10)40
油藻混合水体遥感反射比光谱分析	骆蔚健, 黄妙芬, 杨俊杰, 王 欣	(10)49
台风“利奇马”对东中国海表层悬浮物浓度变化的影响	李 治, 周 舟, 江文胜, 边昌伟	(11)1
黑潮延伸体区域 50~100 km 涡旋分布特征	钱思佳, 于方杰, 陈 戈	(11)10

夏季烟台—威海北部近海溶解氧浓度垂向分布的最小值	孙利元, 刘子洲, 丁金强, 翟方国, 顾艳镇(11)20
九龙江口潮滩表层沉积物矿物磁性分异特征及其沉积环境意义	潘大东, 廖紫慧, 梁文清, 刘亚飞, 肖翊琦, 朱春津(11)30
700 年以来冲绳海槽南部黏土矿物来源及其对沉积环境的响应	杨娅敏, 曾志刚, 殷学博, 陈 帅, 裴文强, 朱博文(11)42
过硫酸氢钾复合物对对虾养殖底泥硝化作用、氨氧化微生物丰度和群落结构的影响	赵 珍, 王宝杰, 刘 梅, 蒋克勇, 王 雷(11)54
凡纳滨对虾“眼柄-促雄性腺-精巢”内分泌轴调控精巢发育的分子机制研究	陈康轩, 李诗豪, 李富花(11)62
盐度、光强和温度对盐生杜氏藻生长的影响及其交互作用	秦瑞阳, 李永富, 刘建国(11)73
一种增强型 YOLOv3 的合成孔径雷达(SAR)舰船检测方法	张 明, 王子龙, 吕晓琪, 喻大华, 张宝华, 李建军(12)1
冲绳海槽中段沉积物物源识别及其热液活动指示	魏杰瑞, 黄 朋(12)8
海阳市典型砂质海岸侵蚀机制与防护对策研究	王勇智, 田梓文, 李 霞, 孙惠凤(12)18
利用脂肪酸标记法对南极罗斯海橈足类优势物种的食性研究	王延清, 张 晔, 牟文秀, 庞志鹏, 陈晓丽(12)31
基于 GIS 的近 30 年长江口及其邻近海域赤潮时空分布特征研究	赵艳民, 秦延文, 张 雷, 乔 飞, 马迎群(12)39
不同饵料对两种帘蛤科贝类生长性能的影响研究	冯森磊, 梁夏菲, 徐 晔, 严维鑫, 葛红星, 董志国(12)47
面向海运统计的 AIS 大数据挖掘分析研究	赵龙飞, 姜晓轶, 孙 苗, 曹 磊, 郭 雪, 吕懂憬(12)55

研究报告

菲和 Cd ²⁺ 单一及复合污染对毛蚶氧化胁迫效应的比较	阎 波, 张 欣, 张 轲, 陈 莉, 田 丹(1)44
温度、盐度和两种麻醉剂对大泷六线鱼幼鱼耗氧率、排氨率的影响	胡发文, 王晓龙, 高凤祥, 李 莉, 菅玉霞, 王 雪, 樊 英, 潘 雷, 郭 文(1)54
解淀粉芽孢杆菌化感作用对球等鞭金藻生长抑制效果	李晓英, 陈义华, 赵裕超, 冯森磊, 李雯倩, 朱 强, 董志国(1)62
光照强度对番红砗磲外套膜颜色变化的影响	刘二田, 何园园, 顾志峰, 石耀华, 王爱民, 刘春胜(1)70
日照近岸海域春秋季节虾蟹类的种类组成特征	王尽文, 杜 明, 林 森, 张绍萍, 蒲思潮, 黄 娟, 李 凡(1)76
海水铝浓度对海链藻活性、生产力及其固碳性的影响	周洁玉, 刘 冬, 田 倩, 周军明, 魏辉煌, 李梦圆, 宋雅然, 刘红昌(1)85
澄迈马袅湾网箱养殖区及周边海域大型底栖生物调查	黄 蓉, 吝思琪, 王爱民, 顾志峰, 石耀华, 刘春胜(1)92
氟苯尼考对太平洋牡蛎(<i>Crassostrea gigas</i>)早期发育的影响	张莺脐, 张美宇, 郭庆芳, 许文豪, 马 峥, 石 硕, 张 倩, 刘 鹰(1)100
近 50 年国际海水淡化技术研究的发展状况——基于 Web of Science 数据库的文献计量分析(1971—2020 年)	温 菲(1)110
扇贝苗规格识别与计数统计装置的设计研究	卢宏博, 李明智, 李尚远, 孙天泽, 曲春虎, 曲文龙(2)59
基于矢量瓦片技术的 Web 电子海图优化方法	范梦琪, 宋伟东, 郑人维, 何 欢(2)68

近 30 年来莱州湾滨海湿地景观格局变化特征研究	黄建涛, 郑伟, 万年新, 路景钊, 李捷	(2)76
单环刺螠染色体核型分析	许星鸿, 甘宏涛, 刘统昊, 孟霄, 丁子媛, 徐国成, 周丽青, 陆子俊, 葛春年	(2)91
施氏獭蛤早期生长性状遗传参数和育种值估计	邹杰, 张守都, 彭慧婧, 郑德斌	(2)99
海底管道整体屈曲的枕木-浮力耦合方法研究	刘润, 李青欣, 李成凤, 郝心童	(2)106
天津近海海底地质灾害类型及声学特征	赵卫, 熊元凯, 宫少军, 詹华明, 乔吉果	(2)119
莱州湾沉积物粒度与重金属分布特征	赵玉庭, 孙珊, 由丽萍, 苏博, 马元庆, 王立明, 齐延民, 张昀昌	(3)43
广东省入海排污口分类分布特征及监督管理措施研究	唐俊逸, 余香英, 刘晋涛, 张文博, 蒋婧媛	(3)51
金乌贼热休克蛋白基因的挖掘及对低盐胁迫的响应	王兴强, 郑年昊, 崔春辉, 曹梅, 沈晔, 刘莹, 张子文, 汤子威, 秦传新, 陈百尧	(3)59
基于专利信息的海上风电技术趋势分析	兰志刚, 兰滢, 孙洋洲, 郭雪飞	(3)71
东方 1-1 海管悬跨分布特征及治理效果分析	黄明泉, 徐景平, 栾振东, 刘猛, 李学成, 刘彬	(3)77
基于荧光猝灭溶解氧传感器的校准方法研究	张颖, 张颖颖, 袁达, 张云燕, 吴丙伟, 冯现东	(3)88
基于自扩展深度置信网络的原油油膜绝对厚度反演研究	姜宗辰, 马毅, 杨俊芳	(3)94
两类 El Niño 事件对中国近海及毗邻海域海表温度的影响	李玲莉, 王林慧, 宋军, 郭俊如, 富砚昭, 蔡宇	(4)51
超强台风“威马逊”作用下红河三角洲海域水动力环境变化的数值研究	乔璐璐, LE DUC Cuong, 李珏, 段晓勇, 印萍	(4)64
水库对海岸带海水入侵影响的数值模拟研究	季智灵, 周晨琦, 赵忠伟, 孔俊	(4)75
XGBoost 算法在多光谱遥感浅海水深反演中的应用	胡鹏, 赵露露, 高磊, 朱金山	(4)83
基于显著性分析的 SAR 溢油图像中暗斑区域检测方法研究	吕新荣, 李云, 温春苗, 任鹏	(4)90
高光谱特征波段在海洋典型溢油油种识别中的精度评估	杨俊芳, 万剑华, 马毅, 姜宗辰, 胡亚斌	(4)97
ICP-MS 测定海洋沉积物重金属微波消解条件的正交试验优化	刘瑶, 刘瑾, 孙玲玲, 孙莹, 宋金明	(4)106
曹妃甸邻近海域浮游动物群落时空变化及其影响因素	刘西汉, 石雅君, 姜会超, 田海兰, 程林, 王红, 王艳霞	(4)114
微塑料对黑海参(<i>Holothuria atra</i>)免疫和消化生理的影响	陈孟玲, 高菲, 王新元, 魏一凡, 许强, 刘春胜	(4)126
基于环境因子的东海马鲛鱼(<i>Scomberomorus niphonius</i>)资源量评估	隋芯, 汪金涛, 陈新军	(4)136
不同环境模式下空间分辨率对北太平洋柔鱼 CPUE 标准化的影响	魏广恩, 陈新军	(4)147
双平板式透空堤消能效果评价方法	张之晨, 李雪艳, 王庆, 高浩杰, 谢天, 战超, 王玉坤	(4)159
基于多处理板联合 SAR 成像的分布式计算模拟系统研究	杨涛, 赵启钊, 孙光才, 李光伟, 费晓燕, 杨军, 刘会涛	(5)54
多模式小卫星 SAR 机载挂飞试验的飞行路线规划与雷达参数设计	薛莲, 周鹏, 张振华, 王影, 张晰, 韩倩倩	(5)62
针对 C 波段组网 SAR 卫星的风场优化反演方法研究	万勇, 时晓磊, 戴永寿	(5)74
船载海水温度观测研究	朱洪海, 祁国梁, 刘茂科, 王志, 杨俊贤, 贺亚楠, 刘帅	(5)87

基于深度学习的光学遥感影像舰船检测算法对比分析	夏文辉, 万剑华, 郑红霞, 许明明, 曲川萍(5)96
基于改进 Faster R-CNN 模型的 SAR 图像溢油检测方法	张天龙, 过杰(5)103
基于机器学习的内孤立波波要素关系研究	李志鑫, 王晶, 张猛(5)113
基于动态海洋环境要素的航行风险评估方法研究	杜沛, 曾喆, 任利锋, 李政海, 杨建昌(5)121
基于 Cesium 的海洋环境要素三维可视化研究	郭晓非, 朱俊利, 万剑华, 汪小琪(5)130
海洋环境航行安全保障决策支持系统设计	杨东方, 刘善伟, 汪小琪, 万剑华(5)137
西太平洋副热带高压对黄海夏季海雾年际变化的影响	刘妹, 高山红(6)79
基于底质类型变化监测的 2005—2018 年西沙永乐群岛珊瑚礁白化分析	逢今朝, 任广波, 施祺, 朱海天, 胡亚斌, 董娟, 马毅(6)92
广西北海半岛夏季营养盐与水质状况分析	徐轶肖, 陶晓婷, 刘成辉, 韦光领, 何喜林, 姚秋翠, 陈武荣, 李斌(6)107
牙鲆 <i>gnrh</i> 基因的表达分析	彭壮壮, 邹玉霞, 刘琰, 梁少帅, 王雯祥, 王丽娟, 邹聪聪, 周顺, 尤锋(6)118
声速剖面 EOF 重构的实测数据采样深度研究	王子衡, 王振杰, 聂志喜, 张远帆(6)126
近四十年来冀津海岸带土地利用时空变化及驱动因素	程林, 田海兰, 武爱彬, 刘西汉, 王艳霞(6)135
山东半岛东部近海海水溶解氧时空变化	刘鹏霞, 刘子洲, 翟方国, 顾艳镇, 何健龙, 靳洋, 何鑫, 陈爱华(7)66
深海潜标姿态的动力学仿真分析与验证及沉降原因探究	王蓓, 陈永华, 于非(7)81
基于 Linux 的气象水文浮标采集系统设计及实现	姜斌, 厉运周, 陈永华(7)95
藻蓝蛋白对四氯化碳诱导的大鼠肝纤维化及肠道微生物的影响	翟诗翔, 李文军, 李莉莉, 王莉, 秦松(7)103
声学探测技术在海底石油管线铺设后调查中的应用	王文龙, 熊指南(7)110
填海类用海定级研究——以深圳市为例	崔东阳, 彭蓉, 陈沛歆, 唐琳(7)121
国际海洋观测计划数据规范化存储与管理的述评	许艳苹(7)127
国际极地研究进展的文献计量分析	崔尚公, 李雪, 杨益, 王少朋, 秦雪, 李红军(7)137
盐度变化对铝牺牲阳极保护效果的影响	刘学庆, 苏文, 赵喜喜, 张守都, 田敬云, 马健, 李友训, 王健(8)34
基于镀铜镉柱海水中硝酸盐氮的检测技术的研究	刘春晖, 黄存款, 张政, 袁方, 王思长, 郑策(8)40
基于一维综合孔径微波辐射计的大气海洋环境参数敏感性分析	冯梦延, 艾未华, 刘茂宏, 陈冠宇, 陆文(8)47
海上风电打桩水下噪声测量及其对大黄鱼的影响	牛富强, 李智, 薛睿超, 杨燕明, 马丽(8)60
辽东湾觉华岛附近海域海底地形地貌及沉积物分布特征分析	张建兴, 宋永东, 栾振东, 杨立建, 甘雨, 阎军(9)40
二、三倍体牙鲆肌肉和脑组织实时定量 PCR 内参基因的筛选及鉴定	杜娜, 张敏, 吴志昊, 焦爽, 尤锋, 谭训刚(9)48
热带珊瑚礁区红腹海参及绿刺参食物来源分析——脂肪酸标志法	吴沛霖, 黄端杰, 马文刚, 高菲, 王爱民, 许强(9)58
基于二元 LSTM 神经网络的船舶运动预测算法研究	张博一, 胡雄, 唐刚, 邵辰彤(9)69
中国温带海域新发现较大面积(大于 50 ha)海草床: IV 烟台沿海海草分布现状及生态特征	岳世栋, 徐少春, 张玉, 乔永亮, 刘明杰, 张晓梅, 王清, 周毅(10)61

台风条件下 ERA5 再分析数据对中国近海的适用性评估	李爱莲, 刘 泽, 洪 新, 侯一筠, 管守德	(10)71
春季长江冲淡水在口门外海域逐月变化及其影响因素分析	赵玉喜, 王珍岩	(10)81
一种精细化的海洋浮标数据质量控制方法	任焕萍, 张 斌, 谭哲韬, 李富超	(10)93
具有运动补偿高精度海洋气象多参数模拟仪的研制	刘 滨, 韩志安, 苏力日, 慕声波	(10)104
冲绳海槽西南部火山岩熔体包裹体的均一温度及对岩浆混合的指示意义	李雪丽, 曾志刚, 李晓辉, 陈祖兴, 张玉祥, 齐海燕	(11)82
天津大神堂海域人工鱼礁区砂壳纤毛虫群落的季节变化	于 莹, 徐晓甫, 王 硕, 张博伦, 张武昌	(11)96
黄河口近岸海域鱼卵、仔稚鱼种类组成及群落结构特征	徐 华, 王 斌, 张 聪, 李 凡, 杨艳艳	(11)105
3 月龄脉红螺表型性状对体质量影响效应分析	贺加贝, 纪 翔, 徐晓莹, 王 鹤, 常婧婷, 周广军, 刘 蓬, 赵 强	(11)118
多检测器凝胶渗透色谱法测定卡拉胶分子量及其稀溶液构象分析	韩 杰, 赵志慧, 林玉凤, 薛志欣, 夏延致	(11)125
基于 WRF 模式的一种台风人造涡旋构建方案	吴云帆, 边 旭, 吴宝勤, 朱先德, 王凤帆	(12)65
黄河口清水沟流路地貌特征研究	杜小康, 王开荣, 裴洪杨, 窦身堂, 毕乃双, 张 辛	(12)77
长江口邻近海域溶解氧的时空分布及影响因素研究	孙 毅, 吕方辉, 陈 钊, 刁新源, 姜金光, 魏传杰, 潘 俊	(12)86
福建省近岸海域环境因子分布特征及富营养化评价	刘丽华, 贺 琦, 兰景权, 田永强, 张江龙, 张亚爽, 许文锋	(12)97

研究综述

鱼类血栓细胞免疫功能的研究现状	高迎莉, 韩高尚, 姚海静, 陈香凝, 周 谦	(1)120
石花菜化学成分与药理作用研究进展	张英格, 伍冠一, 陈 曦	(1)129
蟹守螺总科软体动物的系统分类学研究进展	孙启梦, 张素萍	(1)139
海洋无脊椎动物细胞培养与细胞干性的捕获	岑 卫, 胡梦珠, RINKEVICH Baruch, 胡国斌	(1)146
有害赤潮藻赤潮异弯藻 <i>Heterosigma akashiwo</i> 研究进展	姬南京, 张珍珍, 黄金旺, 申 欣	(2)127
《气候变化中的海洋与冰冻圈特别报告》的蓝碳内容及其影响	赵 鹏, 姜 书, 石建斌	(2)137
几种海藻功能寡糖的结构、制备、活性与应用研究进展	宁利敏, 朱玉翠, 于 光, 曹声生, 朱本伟, 姜 帅, 周明柱	(2)144
国际海洋科技领域研究热点及未来布局	王金平, 吴秀平, 曲建升, 宋姗姗, 党敏文	(2)152
腐蚀成本及控制策略研究	马秀敏, 郑 萌, 徐玮辰, 路东柱, 麻福斌, 侯保荣	(2)161
基于多源观测技术的海堤变形监测方法研究	孙永朝, 丁 咚, 李广雪, 王 蕊, 梁泽浩	(3)108
海洋微塑料污染的生物效应研究进展	刘 香, 茹小尚, 张立斌	(3)122
贝类净化技术研究现状与展望	邱天龙, 陈文超, 祁剑飞, 刘金虎, 董 逸, 孙建明	(3)134
海藻多糖在化妆品中的应用研究进展	陈淑芳, 李明星, 蒙文萍, 代宇超, 路 洁, 周奕杨, 黎庆涛	(3)143
潮滩冲淤观测技术发展现状	张 颖, 闫玉茹, 章家保, 李 静, 裘露露	(3)152

对虾急性肝胰腺坏死病(AHPND)流行病学、诊断及防控措施的研究进展	李吉云, 沈 辉, 孟庆国, 万夕和, 蒋 葛, 乔 毅, 冯艳琴, 李浩澜(3)163
胶州湾海域浮游植物和赤潮物种的生物多样性研究进展	刘淑雅, 陈楠生(4)170
渤海多溴二苯醚的分布特征及其风险评价	王 睿, 林 锐, 王江涛, 谭丽菊(4)189
贻贝对麻痹性贝类毒素的蓄积代谢研究进展	范礼强, 郑关超, 吴海燕, 郭萌萌, 卢 霞, 李 玉, 谭志军(4)201
贝类种群壳形态性状多态性研究进展	刘 括, 李晓彤, 车宗豪, 梁 腾, 方 蕾, 霍忠明, 闫喜武(4)213
SAR 卫星组网观测技术与海洋应用研究进展	李凉海, 刘善伟, 周 鹏, 万 勇(5)145
浅地层剖面探测技术及应用	杨国明, 朱俊江, 赵冬冬, 熊梓翔, 王长盛, 欧小林, 贾永刚, 李三忠(6)147
棘皮动物神经肽结构与功能研究进展	郭雪莹, 丁 奎, 王天明, 吕志猛, 张立斌(6)163
海洋工程施工悬浮泥沙源强及扩散规律研究进展	张 琴(6)176
海底热液成因含金属沉积物的研究现状及展望	朱启宽, 周怀阳(8)69
基于高通量测序技术的北冰洋典型环境原生物多样性研究进展	陈一璇, 孔荷君, 徐大鹏(8)81
哺乳动物类白蛋白家族的结构、功能与演化	苑剑锐, 风 英, 张晓慧, 汲广东(8)89
细菌源 3-羟基脂肪酸作为环境变化代用指标的研究进展	孙棋棋, 宋金明, 袁华茂, 李学刚(8)98
沙菜属(红藻门 杉藻目)的分类学问题探讨	刘金梅, 黄冰心, 马 鑫, 王雪聪, 闫 璟, 闫盼竹, 丁兰平(8)109
珠江口及其邻近海域赤潮物种的生物多样性研究进展	姚艳欣, 陈楠生(9)75
深海采矿整体联动风险分析及应急撤离策略研究	谢梦琪, 杨高胜, 陈丹东, 余 倩, 杨 光, 施 威(9)91
叶绿素传感器海上应用影响因素研究进展	廖丹宁, 郑昱辉, 潘建明, 杨俊毅, 林煜科(9)99
河口海岸滩涂蟹类生物扰动行为过程研究进展	陈 雪, 贺 强, 辛 沛, 龚 政, 周 曾, 张长宽(10)113
海洋生物活性肽的功能、制备技术与作用机制研究进展	杨贵兰, 秦 松, 李文军, 李 亚(10)123
船载海洋生态在线监测技术研究与应用进展	王 宁, 程长阔, 杨鹏程, 李 燕, 司惠民, 任永琴(10)133
潮汐调和分析方法的回顾与展望	吕咸青, 潘海东, 王雨哲(11)132
海洋动物中褪黑素信号系统的研究进展	冯佳倩, 王天明, 杨静文(11)144
对虾养殖水处理管理理念与策略的思考	于道德, 宋静静, 刘凯凯, 叶海斌, 王晓璐, 王友红, 刘洪军(11)156
微藻基因诱变研究及应用进展	杨端鹏, 李仲先, 王胜男, 牛建峰, 王广策, 李 健(11)165
氧化还原敏感性元素在沉积环境判别中的应用研究进展	吕荐阔, 翟世奎, 于增慧, 刘晓锋, 王 轲(12)108
微塑料在海洋中的分布、生态效应及载体作用	陈孟玲, 高 菲, 王新元, 魏一凡, 许 强, 刘春胜(12)125
微藻基因工程在高价值化合物生产上的应用	王 康, 崔玉琳, 高政权, 孟春晓, 秦 松(12)142
光电化学阴极保护技术研究进展	蒋继宏, 张小影, 金祖权(12)150

前言或主编致辞

前言	张 杰(5)1
----	---------

Marine Sciences Volume 45, 2021 Contents

ARTICLES

- Growth, development, and feeding characteristics of *Thamnaconus modestus* during early stages
..... ZHANG Zhe, JIANG Liang-long, WANG Zhen, DU Rong-bin, WU Yan-qing, LIU Li-ming (1)13
- Two new record species of free-living marine nematodes from the East China Sea SUN Jing, HUANG Yong (1)21
- Analysis of the characteristics of water level variation in Dagu River estuary
..... LAI Qiu-yu, LIU Zi-zhou, ZHAI Fang-guo, GU Yan-zhen, CHEN Dong, JIANG Qing-yan (1)31
- Interannual distribution of particulate organic carbon and its influencing factors in the Yangtze River Estuary in spring
..... LI Qian, ZHANG Shan-shan, XIAN Wei-wei (1)43
- Effects of acidification and high N/P ratios on toxin production in *Alexandrium minutum*
..... HAO Shuang, LIU Li-jun, CHEN Jun-hui, HE Xiu-ping, LIAN Zi-ru (2)10
- Community characteristics and spatial distribution of invertebrate macrobenthos in intertidal zone of the Yellow River Delta
..... SHI Hui-jian, LI Xuan, WANG Hai-yan, MA Pei-zhen, ZHANG Wen-wen, YONG Fan, CUI Peng, WU Yi (2)21
- Sediment organic matter sources and carbon stock associated with a mangrove reserve in Danzhou Bay, Hainan, China
..... CHU Meng-fan, XIAO Xiao-tong, DING Yang, ZHAO Mei-xun (2)31
- Observation of internal waves in the ocean using FY-4A meteorological satellite
..... MA Zhi-duo, MENG Jun-min, SUN Li-na, LIU Yong-xin (2)39
- Effect of light intensity on gene expression in the eyes of *Dicentrarchus labrax* juveniles WU Yu-meng, YUAN Zhen,
JIANG Jie-ming, ZHANG Lei, REN Xing-yue, YAO An-qi, SONG Chang-bin, YAN Hong-wei, LIU Ying (2)50
- Spinal vertebrae of a large yellow croaker (*Larimichthys crocea*) along with its early development
..... HUANG Wei-qing, ZHANG Yi, ZHOU Feng-fang, RUAN Shao-jiang,
LIN Pei-hua, ZHOU Zhen-ping, DING Jian-fa, LIU Jia-fu, YANG Jun-fan (2)58
- Characteristics of macrobenthos assemblages in National Special Marine Protected Area at Dongying Estuary Shallow Sea
Shellfish Ecology ZHANG Tian-wen, GUO Wen, JING Yuan-yuan,
LIU En-fu, HU Fan-guang, WANG Shu-gang, LIU Guang-bin (3)13
- Comparison and analysis of two semi-analytical inversion models for water transparency GAO Lei, HU Peng, ZHU Jin-shan (3)23
- Effects of temperature and diet on the ingestion of calanoid copepods: *Parvocalanus crassirostris*
..... CHENG Hao-nan, CHENG Fang-ping, WANG Shu-hong (3)32
- Ensemble forecast of sea fog in Qingdao coastal area based on machine learning
..... GAO Song, XU Jiang-ling, LIU Gui-yan, BI Fan, ZHANG Wei, BAI Tao (3)42
- Spatial and temporal characteristics of sea current within the marine ranches in the northeast of Shandong Peninsula
..... HU Luo-yu, ZHAI Fang-guo, LIU Zi-zhou, LI Pei-liang,
GU Yan-zhen, SUN Li-yuan, LI Xin, CHEN Dong, JIANG Qing-yan (4)12
- Identification of crude oil and emulsified crude oils based on a microwave scattering experiment
..... XU Chen-qi, GUO Jie, YANG Qi-xia, ZHANG Xi, LIU Gen-wang, ZHANG Yan-min (4)21
- Detection of oil spill in the sun glint region of optical remote sensing data based on the convolutional neural network method
..... DU Kai, MA Yi, JIANG Zong-chen, YANG Jun-fang (4)30
- Parameter study of two-body point absorption wave energy converters
..... WANG Teng, LI Shu-bo, XIAO Wei-jie, BAO Xing-xian (4)39
- Changes, structure and optimization of China's marine fishing industry policy: a quantitative analysis based on policy text
..... SHI Lei, SONG Yi-ning, QIN Hong (4)50
- Whitecap sea surface backscattering model for low incidence angles QU Xiao-jun, LI Chen, DAI Yong-shou (5)8
- Research on ship target detection based on satellite video ZHANG Chi, WANG Zhao, SHENG Hui (5)15
- Automatic coastline extraction method based on multitemporal remote sensing data
..... SHENG Hui, ZHANG Chi, WAN Jian-hua (5)22

Establishing a remote sensing classification system and interpretation marks for the coral islands and reefs in the South China Sea	LI Xiao-min, MA Yi, LU Xi-xi (5)30
The prediction of internal solitary wave propagation characteristics in the southern Andaman Sea based on a support vector machine	LU Ke-xiao, WANG Jing, WEI Xin (5)38
Ship rescue path planning considering adverse sea conditions	MA Kai-qiang, REN Li-feng, ZENG Zhe, WAN Jian-hua (5)46
A rapid construction method of remote sensing image map services based on COG	CHEN Yu-hang, SHENG Hui, LIU Shan-wei, HE Ya-wen (5)53
Hydrodynamic processes of the bottom boundary layer and suspended sediment transport in the Sansha Bay in summer	QI Yu-kai, TU Jun-biao, YU Jun-jie, FAN Dai-du (6)12
Effects of different vegetation types on organic carbon burial in tidal flats of the Sansha Bay, Fujian Province	LI Jian-cheng, WU Yi-jing, JIANG Bin-bin, SU Jian-feng, YU Jun-jie, FAN Dai-du (6)21
Distribution, classification, and origin of Neogene deep oceanic red beds	XIONG Zi-xiang, ZHU Jun-jiang, YANG Guo-ming, WANG Chang-sheng, JIA Zhong-jia, OU Xiao-lin, LI San-zhong (6)33
Covariance localization in the ensemble transform Kalman filter data assimilation method	WANG Ji-chao, WANG Yue, ZANG Shao-dong, YANG Jun-gang, JI Yan-ju, RUAN Zong-li (6)43
Preparation of low surface energy aluminum oxide film under temperature-controlled heating and its corrosion protection	ZHENG Meng, ZHU Qing-jun, SUN Xin, LIU Fang-hao, DUAN Ji-zhou (6)48
Chlorophyll content in Xiamen Bay—spatiotemporal distribution and relationship with water environmental factors	YU Xiu-xia, SUN Lin, CHEN Chang-ping (6)62
Key areas for integrated governance of marine resources and environment in the Changjiang River Delta—Results from the impact analysis of the value of marine ecosystem service	HE Yi-xiong, SONG Wei-ming, YANG Fan (6)78
Spatial and temporal variation characteristics of the waves in the Yellow Sea and Bohai Sea	QIU Wen-bo, LI Guan-yu, XU Jun-chen, HU Yi-qun, WANG Ya-ding, SHI Hong-yuan (7)8
Monitoring of <i>Porphyra</i> cultivation dynamics in Lianyungang based on coastal zone imager	WANG Xin-hua, LIU Jian-qiang, XING Qian-guo, CHEN Yan-long (7)17
Characteristics of mainland shoreline position changes of Maritime Silk Road in the early 21st century	SONG Yang, ZHANG Yu-xin, HOU Xi-yong (7)28
Global tide simulation based on the semi-implicit cross-scale hydroscience integrated system model	TU Cheng-dong, JI Qi-yan, ZUO Jun-cheng (7)40
New technology of deep-sea manganese nodule smelting with coal instead of coke	PENG Jun, ZHOU Xiao-zhou, SHEN Yu-jun, LIU Qiang, ZHONG Shan, CAI Yun-zhuo, HUANG Zong-peng (7)45
Variation of bacteria in flocs after removal of <i>Karenia mikimotoi</i> by different types of modified clay	DING Yu, SONG Xiu-xian, CAO Xi-hua, YU Zhi-ming (7)56
Study on the hydrochemical evolution of groundwater and seawater intrusion in the shallow layer of Wendeng District	GUO Ming-hua, WANG Jing, DAI Chang-guo, JIANG Lei, ZHANG Hao-qing, LIU Chao (7)65
Effects of stratification and tides on the transport of particulate nitrogen and phosphorus near the Changjiang River Estuary in summer	GE Tian-tian, WANG Xin-yang, TAN Li-ju, LI Tie (8)9
Spatial and temporal distribution and factors influencing the phytoplankton community structure in the Bohai Sea	LI Zi-lin, ZHANG Hai-yan, ZHAO Liang, XU Fan (8)20
Evolution of China's marine resources, environmental, and economic complex system—an empirical analysis based on the logistic model	SONG Ze-ming, NING Ling (8)33
Estimation of heat generation in the Santos basin with natural gamma logging data	SUN Xu-dong, GUO Xing-wei, ZHENG Qiu-gen, WEN Zhen-he, ZHANG Xun-hua, WANG Jin-zhou, LI Zi-yuan (9)11
Comparative analysis of nutrient composition of the ovaries and hepatopancreas in the mud crab <i>Scylla paramamosain</i> at two stages of ovary maturation	YU Guo-hong, WANG Yang-cai, JIN Zhong-wen (9)20
Study on analysis method of regional marine reclamation stock based on life cycle	FANG Jian, LIU Bai-qiao, LIU Li-dong, HUANG Qiu-shuang, FU Yang-zi (9)28

Investigation of submarine groundwater discharge using the coupled surface–subsurface modeling	LUO Lu, YU Xuan, LIU Bing-jun, CHEN Xiao-hong (9)39
Dynamics of wind jets-induced Kuroshio variability in the Luzon Strait	CHANG Ti, WANG Zheng, YUAN Dong-liang (10)10
Estimation of green tide stranded biomass in the Yellow Sea based on unmanned aerial vehicle remote sensing	SHANG Wei-tao, GAO Zhi-qiang, JIANG Xiao-peng, TIAN Xin-peng, GUO Shao-fang (10)19
Dynamic characteristics and causes of shallow groundwater level intra-annual changes in the Yellow River Delta	CHANG Mao-xiang, SHI Jing-hao, YE Si-yuan, WANG Xiang-dong, LI Guang-xue (10)31
Economic loss assessment of storm-surge disasters based on the KPCA-RBF model	YANG Xue-xue, LIU Qiang (10)39
Fishing characteristics of double trawler using vessel monitoring system data	YU Jie, ZHOU Yan-bo, TANG Zhen-zhao, CHEN Guo-bao, ZENG Lei (10)48
Remote sensing reflectance spectral analysis of oil and algae mixed water	LUO Wei-jian, HUANG Miao-fen, YANG Jun-jie, WANG Xin (10)60
Effect of Typhoon Lekima on variations of surface-suspended sediment concentration in the East China Seas	LI Zhi, ZHOU Zhou, JIANG Wen-sheng, BIAN Chang-wei (11)9
Distribution characteristics of eddies with a scale of 50~100 km in the Kuroshio Extension region	QIAN Si-jia, YU Fang-jie, CHEN Ge (11)19
Minima in vertical distributions of dissolved oxygen concentration in the northern coastal oceans of Yantai-Weihai	SUN Li-yuan, LIU Zi-zhou, DING Jin-qiang, ZHAI Fang-guo, GU Yan-zhen (11)29
Mineral magnetic characteristics of tidal flat surficial sediments and their implications for sedimentary environment identification in the Jiulong Estuary	PAN Da-dong, LIAO Zi-hui, LIANG Wen-qing, LIU Ya-fei, XIAO Yi-qi, ZHU Chun-jin (11) 41
Sediment provenance and its response to the paleoenvironment in the southern Okinawa Trough over the past 700 years	YANG Ya-min, ZENG Zhi-gang, YIN Xue-bo, CHEN Shuai, PEI Wen-qiang, ZHU Bo-wen (11) 53
Effects of potassium monopersulfate on the nitrification, abundance, and community structure of ammonia-oxidizing microorganisms in shrimp culture sediments	ZHAO Zhen, WANG Bao-jie, LIU Mei, JIANG Ke-yong, WANG Lei (11)61
Regulatory mechanisms of the eyestalk–androgenic gland–testis endocrine axis on testis development in <i>Litopenaeus vannamei</i>	CHEN Kang-xuan, LI Shi-hao, LI Fu-hua (11)72
Effects of salinity, light, and temperature and their interactions on <i>Dunaliella salina</i> growth	QIN Rui-yang, LI Yong-fu, LIU Jian-guo (11)81
An enhanced YOLOv3 method for synthetic aperture radar (SAR) ship detection	ZHANG Ming, WANG Zi-long, LÜ Xiao-qi, YU Da-hua, ZHANG Bao-hua, LI Jian-jun (12)7
Provenance identification of sediments in the central Okinawa Trough and its implications for hydrothermal activity	WEI Jie-rui, HUANG Peng (12)17
Coastal erosion mechanism and its prevention in Haiyang	WANG Yong-zhi, TIAN Zi-wen, LI Xia, SUN Hui-feng (12)30
Application of fatty acids in the diet analysis of five copepod species in Ross Sea, Antarctic	WANG Yan-qing, ZHANG Ye, MOU Wen-xiu, PANG Zhi-peng, CHEN Xiao-li (12)38
Temporal and spatial distribution of red tides in the Changjiang estuary and in adjacent waters from 1989 to 2019	ZHAO Yan-min, QIN Yan-wen, ZHANG Lei, QIAO Fei, MA Ying-qun (12)46
Effects of distinct feed categories on the growth performance of two <i>Venerdia</i> species	FENG Sen-lei, LIANG Xia-fei, XU Ye, YAN Wei-xin, GE Hong-xing, DONG Zhi-guo (12)54
AIS big data mining for maritime statistics	ZHAO Long-fei, JIANG Xiao-yi, SUN Miao, CAO Lei, GUO Xue, LÜ Chong-jing (12)64

REPORTS

Comparison of single and combined pollution effect of phenanthrene and cadmium on the oxidative pressure of <i>Anadara subcrenata</i>	YAN Bo, ZHANG Xin, ZHANG Ke, CHEN Li, TIAN Dan (1)53
Influence of temperature, salinity, and anesthetics on the oxygen consumption and ammonia excretion rates in fat greenling (<i>Hexagrammos otakii</i>) juveniles	HU Fa-wen, WANG Xiao-long, GAO Feng-xiang, LI Li, JIAN Yu-xia, WANG Xue, FAN Ying, PAN Lei, GUO Wen (1)61

Allelopathic effect of <i>Bacillus amyloliquefaciens</i> on the growth of <i>Isochrysis galbana</i>	LI Xiao-ying, CHEN Yi-hua, ZHAO Yu-chao, FENG Sen-lei, LI Wen-qian, ZHU Qiang, DONG Zhi-guo (1)69
Effect of light intensity on the change in mantle color of the boring giant clam <i>Tridacna crocea</i>	LIU Er-tian, HE Yuan-yuan, GU Zhi-feng, SHI Yao-hu1, WANG Ai-min, LIU Chun-sheng (1)75
Composition of shrimps and crabs in the coastal waters of Rizhao during spring and autumn seasons	WANG Jin-wen, DU Ming, LIN Sen, ZHANG Shao-ping, PU Si-chao, HUANG Juan, LI Fan (1)84
Effects of aluminum concentration in seawater on the activity, productivity, and carbon sequestration of <i>Thalassiosira weissflogii</i>	ZHOU Jie-yu, LIU Dong, TIAN Qian, ZHOU Jun-ming, WEI Hui-huang, LI Meng-yuan, SONG Ya-ran, LIU Hong-chang (1)91
Investigation of macrobenthos of cage culture and the adjacent sea area in Maniao Bay, Chengmai	HUANG Rong, LIN Si-qi, WANG Ai-min, GU Zhi-feng, SHI Yao-hua, LIU Chun-sheng (1)99
Effects of florfenicol on the development of <i>Crassostrea gigas</i> during the early developmental stage	ZHANG Ying-qi, ZHANG Xian-yu, GUO Qing-fang, XU Wen-hao, MA Zheng, SHI Shuo, ZHANG Qian, LIU Ying (1)109
Research on international seawater desalination in past 50 years—a bibliometric analysis of the Web of Science Core Collection.....	WEN Fei (1)119
Design of scallop seedling specification recognition and counting device	LU Hong-bo, LI Ming-zhi, LI Shang-yuan, SUN Tian-ze, QU Chun-hu, QU Wen-long (2)67
Electronic chart optimized method based on the vector tiles technology	FAN Meng-qi, SONG Wei-dong, ZHENG Ren-wei, HE Huan (2)75
Characteristics of changes occurring in the landscape patterns in the coastal wetlands of the Laizhou Bay in the last 30 years	HUANG Jian-tao, ZHENG Wei, WAN Nian-xin, LU Jing-fang, LI Jie (2)90
Karyotype analysis of <i>Urechis unicinctus</i>	XU Xing-hong, GAN Hong-tao, LIU Tong-hao, MENG Xiao, DING Zi-yuan, XU Guo-cheng, ZHOU Li-qing, LU Zi-jun, GE Chun-nian (2) 98
Estimation of genetic parameters and breeding values of early growth traits of <i>Lutraria sieboldii</i>	ZOU Jie, ZHANG Shou-du, PENG Hui-jing, ZHENG De-bin (2)105
Study on sleeper-buoyancy coupling method for global buckling of submarine pipelines	LIU Run, LI Qing-xin, LI Cheng-feng, HAO Xin-tong (2)118
Acoustic characteristics and types of submarine geological hazards in Tianjin offshore areas	ZHAO Wei, XIONG Yuan-kai, GONG Shao-jun, ZHAN Hua-ming, QIAO Ji-guo (2)126
Distribution characteristics of grain size and heavy metals of sediments in Laizhou Bay	ZHAO Yu-ting, SUN Shan, YOU Li-ping, SU Bo, MA Yuan-qing, WANG Li-ming, QI Yan-min, ZHANG Yun-chang (3)50
Classified distribution characteristics, supervision, and management measures for sewage outfalls into the sea in Guangdong Province.....	TANG Jun-yi, YU Xiang-ying, LIU Jin-tao, ZHANG Wen-bo, JIANG Jing-yuan (3)58
Excavation of heat shock protein gene and its response to low salinity stress in <i>Sepia esculenta</i>	WANG Xing-qiang, ZHENG Nian-hao, CUI Chun-hui, CAO Mei, SHEN Ye, LIU Ying, ZHANG Zi-wen, TANG Zi-wei, QIN Chuan-xin, CHEN Bai-yao (3)70
Analysis of offshore wind technology based on patent information	LAN Zhi-gang, LAN Ying, SUN Yang-zhou, GUO Xue-fei (3)76
Analysis of DF1-1 subsea pipeline free-span distribution characteristics and rectification effects	HUANG Ming-quan, XU Jing-ping, LUAN Zhen-dong, LIU Meng, LI Xue-cheng, LIU Bin (3)87
Calibration method of a fluorescence quenching dissolved oxygen sensor	ZHANG Ying, ZHANG Ying-ying, YUAN Da, ZHANG Yun-yan, WU Bing-wei, FENG Xian-dong (3)93
Inversion of absolute thickness of crude-oil film based on self-expanding deep belief network	JIANG Zong-chen, MA Yi, YANG Jun-fang (3)107
Effects of two types of El Niño events on the sea surface temperature in China's offshore and adjacent seas	LI Ling-li, WANG Lin-hui, SONG Jun, GUO Jun-ru, FU Yan-zhao, CAI Yu (4)63
Numerical modeling of hydrodynamic changes due to super Typhoon Rammasun in the Red River Delta coastal area	QIAO Lu-lu, LE DUC Cuong, LI Jue, DUAN Xiao-yong, YIN Ping (4)74

Numerical study of the influence of coastal reservoir on seawater intrusion	JI Zhi-ling, ZHOU Chen-qi, ZHAO Zhong-wei, KONG Jun (4)82
Application of XGBoost algorithm on multispectral shallow water bathymetry retrieval	HU Peng, ZHAO Lu-lu, GAO Lei, ZHU Jin-shan (4)89
Dark spot detection in SAR oil-spilled images based on saliency analysis	LYU Xin-rong, LI Yun, WEN Chun-miao, REN Peng (4)96
Accuracy assessments of hyperspectral characteristic waveband for common marine oil spill types identification	YANG Jun-fang, WAN Jian-hua, MA Yi, JIANG Zong-chen, HU Ya-bin (4)105
Optimization of microwave digestion conditions for determination of heavy metals in marine sediments by ICP-MS	LIU Yao, LIU Jin, SUN Ling-ling, SUN Xuan, SONG Jin-ming (4)113
Spatial and temporal variations of zooplankton community and their influential factors in Caofeidian coastal waters	LIU Xi-han, SHI Ya-jun, JIANG Hui-chao, TIAN Hai-lan, CHENG Lin, WANG Hong, WANG Yan-xia (4)125
Effects of microplastics on immunity and digestion of sea cucumber, <i>Holothuria atra</i>	CHEN Meng-ling, GAO Fei, WANG Xin-yuan, WEI Yi-fan, XU Qiang, LIU Chun-sheng (4)135
Resource assessment of <i>Scomberomorus niphonius</i> dependent environmental factors in East China Sea	SUI Xin, WANG Jin-tao, CHEN Xin-jun (4)146
Impacts of spatial resolution under different environment modes on CPUE standardization in the North Pacific Ocean	WEI Guang-en, CHEN Xin-jun (4)158
Evaluation method of the energy dissipation effect of a double-flat-slab open dike	ZHANG Zhi-chen, LI Xue-yan, WANG Qing, GAO Hao-jie, XIE Tian, ZHAN Chao, WANG Yu-kun (4) 169
Distributed computing simulation system based on a multi-processing board combined with SAR imaging	YANG Tao, ZHAO Qi-zhao, SUN Guang-cai, LI Guang-wei, FEI Xiao-yan, YANG Jun, LIU Hui-tao (5)61
Flight paths planning and radar parameters design of airborne flight test for multi-mode small satellite SARs	XUE Lian, ZHOU Peng, ZHANG Zhen-hua, WANG Ying, ZHANG Xi, HAN Qian-qian (5)73
Wind field optimization inversion method for C-band networked SAR satellite	WAN Yong, SHI Xiao-lei, DAI Yong-shou (5)86
Observation of ship-borne sea surface temperature	ZHU Hong-hai, QI Guo-liang, LIU Mao-ke, WANG Zhi, YANG Jun-xian, HE Ya-nan, LIU Shuai (5)95
Comparative analysis of ship detection algorithms based on deep learning in optical remote sensing images	XIA Wen-hui, WAN Jian-hua, ZHENG Hong-xia, XU Ming-ming, QU Chuan-ping (5)102
Oil spill detection method for SAR images based on the improved Faster R-CNN model	ZHANG Tian-long, GUO Jie (5)112
Relationship between wave elements of internal solitary waves based on machine learning	LI Zhi-xin, WANG Jing, ZHANG Meng (5)120
Navigation risk assessment method based on dynamic marine environmental factors	DU Pei, ZENG Zhe, REN Li-feng, LI Zheng-hai, YANG Jian-chang (5)129
3D visualization of marine environmental elements based on Cesium	GUO Xiao-fei, ZHU Jun-li, WAN Jian-hua, WANG Xiao-qi (5)136
Design of decision support system for marine environment navigation security	YANG Dong-fang, LIU Shan-wei, WANG Xiao-qi, WAN Jian-hua (5)144
Influence of the western Pacific subtropical high on the interannual variation of summer sea fog over the Yellow Sea	LIU Shu, GAO Shan-hong (6)91
Analysis of coral reef bleaching in Yongle Islands of Xisha from 2005 to 2018 based on sediment types change monitoring	PANG Jin-zhao, REN Guang-bo, SHI Qi, ZHU Hai-tian, HU Ya-bin, DONG Juan, MA Yi (6)106
Nutrients and water quality in the Beihai Peninsula of Guangxi during summers	XU Yi-xiao, TAO Xiao-ping, LIU Cheng-hui, WEI Guang-ling, HE Xi-lin, YAO Qiu-cui, CHEN Wu-rong, LI Bin (6)117
Expression analysis of <i>gnrh</i> in <i>Paralichthys olivaceus</i>	PENG Zhuang-zhuang, ZOU Yu-xia, LIU Yan, LIANG Shao-shuai, WANG Wen-xiang, WANG Li-juan, ZOU Cong-cong, ZHOU Shun, YOU Feng (6)125
Research on the sampling depth in the EOF reconstruction of the sound speed profile	WANG Zi-heng, WANG Zhen-jie, NIE Zhi-xi, ZHANG Yuan-fan (6)134

Spatiotemporal changes and the drivers of coastal land use in Hebei and Tianjin in recent 40 years	CHENG Lin, TIAN Hai-lan, WU Ai-bin, LIU Xi-han, WANG Yan-xia (6)146
Temporal-spatial variations in dissolved oxygen in the eastern coastal area of the Shandong Peninsula	LIU Peng-xia, LIU Zi-zhou, ZHAI Fang-guo, GU Yan-zhen, HE Jian-long, JIN Yang, HE Xin, CHEN Ai-hua (7)80
Dynamic simulation analysis and verification of attitude of deep-sea submersible buoy and exploration of settlement causes	WANG Bei, CHEN Yong-Hua, YU Fei (7)94
Design and implementation of a meteorological and hydrological buoy acquisition system based on Linux	JIANG Bin, LI Yun-zhou, CHEN Yong-hua (7)102
Effects of phycocyanin on carbon tetrachloride-induced hepatic fibrosis and gut microbiota in rats	ZHAI Shi-xiang, LI Wen-jun, LI Li-li, WANG Li, QIN Song (7)109
Application of acoustic detection technology in investigation after laying submarine oil pipelines	WANG Wen-long, XIONG Zhi-nan (7)120
Grading of sea area in reclamation: A case study of Shenzhen City	CUI Dong-yang, PENG Rong, CHEN Pei-xin, TANG Lin (7)126
Review of standardized data archiving and management of international ocean observation programs	XU Yan-ping (7)136
Bibliometric analysis of international polar research progress	CUI Shang-gong, LI Xue, YANG Yi, WANG Shao-peng, QIN Xue, LI Hong-jun (7)146
Effect of salinity variation on the protective performance of Al sacrificial anode	LIU Xue-qing, SU Wen, ZHAO Xi-xi, ZHANG Shou-du, TIAN Jing-yun, MA Jian, LI You-xun, WANG Jian (8)39
Research for detection technology of nitrate nitrogen in seawater based on a copper-plated cadmium column	LIU Chun-hui, HUANG Cun-kuan, ZHANG Zheng, YUAN Fang, WANG Si-chang, ZHENG Ce (8)46
Sensitivity analysis of atmospheric and oceanic environmental parameters based on one-dimensional synthetic aperture microwave radiometer	FENG Meng-yan, AI Wei-hua, Liu Mao-hong, CHEN Guan-yu, LU Wen (8)59
Impact of pile driving underwater noise from offshore wind turbines on the large yellow croaker (<i>Pseudosciaena crocea</i>)	NIU Fu-qiang, LI Zhi, XUE Rui-chao, YANG Yan-ming, MA Li (8)68
Analysis of the characteristics of submarine topography and distribution of sediments near Juehua Island, Liaodong Bay	ZHANG Jian-xing, SONG Yong-dong, LUAN Zhen-dong, YANG Li-jian, GAN Yu, YAN Jun (9)47
Selection and identification of potential reference genes for qPCR in muscle and brain of diploid and triploid olive flounder	DU Na, ZHANG Min, WU Zhi-hao, JIAO Shuang, YOU Feng, TAN Xun-gang (9)57
Determination of the food sources of two tropical coral reef sea cucumbers <i>Holothuria edulis</i> and <i>Stichopus chloronotus</i> using a fatty acid biomarker analysis.....	WU Pei-lin, HUANG Duan-jie, MA Wen-gang, GAO Fei, WANG Ai-min, XU Qiang (9)68
Ship motion prediction algorithm based on binary LSTM neural network	ZHANG Bo-yi, HU Xiong, TANG Gang, SHAO Chen-tong (9)74
New discovery of larger seagrass beds with area >50 ha in the temperate waters of China: IV Distribution status and ecological characteristics of seagrass in the coastal waters of Yantai.....	YUE Shi-dong, XU Shao-chun, ZHANG Yu, QIAO Yong-liang, LIU Ming-jie, ZHANG Xiao-mei, WANG Qing, ZHOU Yi (10)70
Applicability of the ERA5 reanalysis data to China adjacent Sea under typhoon condition	LI Ai-lian, LIU Ze, HONG Xin, HOU Yi-jun, GUAN Shou-de (10)80
The monthly changes and its influencing factors of the Changjiang Diluted Water off the estuary in spring	ZHAO Yu-xi, WANG Zhen-yan (10)92
A new quality control scheme for marine buoy temperature and salinity data	REN Huan-ping, ZHANG Bin, TAN Zhe-tao, LI Fu-chao (10)103
Development of a high-precision marine meteorological multi-parameter simulator with motion compensation	LIU Bin, HAN Zhi-an, SU Li-ri, QI Sheng-bo (10)112
Homogeneous temperature study of melt inclusions in volcanic rocks from the southwestern Okinawa Trough: Insights into magma mixing processes	LI Xue-li, ZENG Zhi-gang, LI Xiao-hui, CHEN Zu-xing, ZHANG Yu-xiang, QI Hai-yan (11)95
Seasonal variation of tintinnid community in the artificial fish reef area of Dashentang waters in Tianjin	YU Ying, XU Xiao-fu, WANG Shuo, ZHANG Bo-lun, ZHANG Wu-chang (11)104

Species composition and community structure of ichthyoplankton in coastal waters of Huanghe estuary	XU Hua, WANG Bin, ZHANG Cong, LI Fan, YANG Yan-yan (11)117
Phenotypic traits predicting body mass in three-month old <i>Rapana venosa</i>	HE Jia-bei, JI Xiang, XU Xiao-ying, WANG He, CHANG Jing-ting, ZHOU Guang-jun, LIU Peng, ZHAO Qiang (11)124
Determination of carrageenan molecular weight and dilute solution conformation by tridetector array gel permeation chromatography	HAN Jie, ZHAO Zhi-hui, LIN Yu-feng, XUE Zhi-xin, XIA Yan-zhi (11)131
A typhoon Bogus vortex scheme constructed on the Weather Research and Forecasting (WRF) model	WU Yun-fan, BIAN Xu, WU Bao-qin, ZHU Xian-de, WANG Feng-fan (12)76
Geomorphic characteristics of the Qingshuigou flow path in the Yellow River estuary	DU Xiao-kang, WANG Kai-rong, PEI Hong-yang, DOU Shen-tang, BI Nai-shuang, ZHANG Xin (12)85
Spatial-temporal distribution and dynamics of dissolved oxygen in an adjacent area of the Changjiang estuary	SUN Yi, LÜ Fang-hui, CHEN Zhao, DIAO Xin-yuan, JIANG Jin-guang, WEI Chuan-jie, PAN Jun (12)96
Distribution characteristics of environmental factors and eutrophication assessment in the Fujian coastal areas	LIU Li-hua, HE Qi, LAN Jing-quan, TIAN Yong-qiang, ZHANG Jiang-long, ZHANG Ya-shuang, XU Wen-feng (12)107
REVIEWS	
Current research on the immune function of thrombocytes in fish	GAO Ying-li, HAN Gao-shang, YAO Hai-jing, CHEN Xiang-ning, ZHOU Qian-qing (1)128
Chemical constituents and pharmacological effects of <i>Gelidium amansii</i>	ZHANG Ying-ge, WU Guan-yi, CHEN Xi (1)138
Progress of systematic studies on Cerithioidea (Mollusca, Gastropoda, Caenogastropoda)	SUN Qi-meng, ZHANG Su-ping (1)145
Establishment of cell lines from marine invertebrates by inducing cellular stemness	CEN Wei, HU Meng-zhu, RINKEVICH Baruch, HU Guo-bin (1)154
Recent progress in the research on harmful alga <i>Heterosigma akashiwo</i> (Raphidophyceae)	JI Nan-jing, ZHANG Zhen-zhen, HUANG Jin-wang, SHEN Xin (2)136
Blue carbon in the Special Report on the Ocean and Cryosphere in a Changing Climate and its impacts	ZHAO Peng, JIANG Shu, SHI Jian-bin (2)143
Recent advances in the structure, preparation, activity, and application of several marine seaweed functional oligosaccharides	NING Li-min, ZHU Yu-cui, YU Guang, CAO Sheng-sheng, ZHU Ben-wei, JIANG Shuai, ZHOU Ming-zhu (2)151
International research hotspots and future layout in the field of marine science	WANG Jin-ping, WU Xiu-ping, QU Jian-sheng, SONG Shan-shan, DANG Min-wen (2)160
Study of corrosion cost and control strategy	MA Xiu-min, ZHENG Meng, XU Wei-chen, LU Dong-zhu, MA Fu-bin, HOU Bao-rong (2)168
Monitoring methods of seawall deformation based on multi-source observation technology	SUN Yong-zhao, DING Dong, LI Guang-xue, WANG Rui, LIANG Ze-hao (3)121
Research progress on the biological effects of marine microplastic pollution	LIU Xiang, RU Xiao-shang, ZHANG Li-bin (3)133
Research status and prospects of shellfish depuration technology	QIU Tian-long, CHEN Wen-chao, QI Jian-fei, LIU Jin-hu, DONG Yi, SUN Jian-ming (3)142
Application of seaweed polysaccharides in cosmetics	CHEN Shu-fang, LI Ming-xing, MENG Wen-ping, DAI Yu-chao, LU Jie, ZHOU Yi-yang, LI Qing-tao (3)151
Current situation of tidal flat erosion-deposition observation technology	ZHANG Ying, YAN Yu-ru, ZHANG Jia-bao, LI Jing, QIU Lu-lu (3)162
Research progress on the epidemiology, diagnosis, prevention, and control of acute hepatopancreas necrosis in shrimp	LI Ji-yun, SHEN Hui, MENG Qing-guo, WAN Xi-he, JIANG Ge, QIAO Yi, FENG Yan-qin, LI Hao-lan (3)172
Advances in biodiversity analysis of phytoplankton and harmful algal bloom species in the Jiaozhou Bay	LIU Shu-ya, CHEN Nan-sheng (4)188
Distribution and risk assessment of polybrominated diphenyl ethers in the Bohai Sea	WANG Rui, LIN Kun, WANG Jiang-tao, TAN Li-ju (4)200

Research progress on the accumulation and metabolism of paralytic shellfish toxin in mussels	FAN Li-qiang, ZHENG Guan-chao, WU Hai-yan, GUO Meng-meng, LU Xia, LI Yu, TAN Zhi-jun (4)212
Current trends in population research on shell morphological polymorphism of mollusks	LIU Kuo, LI Xiao-tong, CHE Zong-hao, LIANG Teng, FANG Lei, HUO Zhong-ming, YAN Xi-wu (4)221
Research progress of SAR satellite network observation technology and ocean application	LI Liang-hai, LIU Shan-wei, ZHOU Peng, WAN Yong (5)156
Development and application of sub-bottom profiler technologies	YANG Guo-ming, ZHU Jun-jiang, ZHAO Dong-dong, XIONG Zi-xiang, WANG Chang-sheng, OU Xiao-lin, JIA Yong-gang, LI San-zhong (6)162
The research progress of neuropeptide structure and function in echinoderms	GUO Xue-ying, DING Kui, WANG Tian-ming, LV Zhi-meng, ZHANG Li-bin (6)175
Research overview on source and diffusion of suspended solids in ocean engineering construction	ZHANG Qin (6)184
Reviews and prospects of submarine metalliferous sediments of hydrothermal origin	ZHU Qi-kuan, ZHOU Huai-yang (8)80
Advances in protist diversity studies in representative environments of the Arctic Ocean based on high-throughput sequencing	CHEN Yi-xuan, KONG He-jun, XU Da-peng (8)88
The structure, function and evolution of mammalian albumin multigene family	YUAN Jian-rui, FENG Ying, ZHANG Xiao-hui, JI Guang-dong (8)97
Bacterial 3-hydroxy fatty acids as a biomarker of environmental change	SUN Qi-qi, SONG Jin-ming, YUAN Hua-mao, LI Xue-gang (8)108
Discussion on the taxonomic problems of the genus <i>Hypnea</i>	LIU Jin-mei, HUANG Bing-xin, MA Xin, WANG Xue-cong, YAN Jing, YAN Pan-zhu, DING Lan-ping (8)117
Biodiversity of phytoplankton and red tide species in the Pearl River Estuary	YAO Yan-xin, CHEN Nan-sheng (9)90
Overall linkage risk analysis and emergency evacuation strategy of a deep-sea mining system	XIE Meng-qi, YANG Gao-sheng, CHEN Dan-dong, YU Qian, YANG Guang, SHI Wei (9)98
Research progress on factors influencing the marine application of chlorophyll sensors	LIAO Dan-ning, ZHENG Min-hui, PAN Jian-ming, YANG Jun-yi, LIN Deng-ke (9)105
Research progress on the biological disturbed behavior process of crabs in the tidal flats of estuaries and coasts	CHEN Xue, HE Qiang, XIN Pei, GONG Zheng, ZHOU Zeng, ZHANG Chang-kuan (10)122
Function, preparation technology, and mechanism of marine biological active peptides	YANG Gui-lan, QIN Song, LI Wen-jun, LI Ya (10)132
Research and application progress of shipborne marine ecological online monitoring technology	WANG Ning, CHENG Chang-kuo, YANG Peng-cheng, LI Yan, SI Hui-min, REN Yong-qin (10)140
Review and prospect of tidal harmonic analysis method	LV Xian-qing, PAN Hai-dong, WANG Yu-zhe (11)143
Research progress of the melatonin signaling system in marine animals	FENG Jia-qian, WANG Tian-ming, YANG Jing-wen (11)155
Wastewater treatment for shrimp culture: Concepts and strategies	YU Dao-de, SONG Jing-jing, LIU Kai-kai, YE Hai-bin, WANG Xiao-lu, WANG You-hong, LIU Hong-jun (11)164
Advances in the research and application of mutagenesis in microalgae	YANG Duan-peng, LI Zhong-xian, WANG Sheng-nan, NIU Jian-feng, WANG Guang-ce, LI Jian (11)178
Application and influence factors of redox-sensitive elements in a sedimentary environment	LÜ Jian-kuo, ZHAI Shi-kui, YU Zeng-hui, LIU Xiao-feng, WANG Ke (12)124
Distribution, ecological effects, and carrier function of microplastics in the marine environment	CHEN Meng-ling, GAO Fei, WANG Xin-yuan, WEI Yi-fan, XU Qiang, LIU Chun-sheng (12)141
Application of microalgae genetic engineering in the production of high-value compounds	WANG Kang, CUI Yu-lin, GAO Zheng-quan, MENG Chun-xiao, QIN Song (12)149
Research progress in photochemical cathodic protection technology	JIANG Ji-hong, ZHANG Xiao-ying, JIN Zu-quan (12)161

PREFACE

Preface	ZHANG Jie (5)1
---------	----------------