

※ 참고자료(경비 세부내역)

- 1) 적용기준 : KMI 여비규정 국가 및 도시별 등급구분 중 나등급 적용(오스트레일리아)
- 2) 국외출장 공무상 필요에 의해 로밍 신청(공무통화내역 사후 실비정산)
- 3) 여행자보험, 현지 차량렌트비, 로밍이용 요금, 제수수료 등 : 실비정산
- 4) 현지 회의 개최
 - 남정호 : 3회
 - 임중서 : 2회
- 5) 예산항목
 - 남정호 : 「해양 기후변화 진단 및 장기전망 연구 사업」(수탁)
 - 임중서 : 「새만금 주변해역 해양환경 및 생태계관리 연구개발 사업」(수탁)
- 6) 체재비

출장자	체재비				비고
	숙박비	일비	식비	소계	
남정호	\$160 X 6박 = \$960 이내 사후정산	\$35 X 7일 = \$245	(\$78 X 7일)-78 = \$468	\$713	식비 3회 차감 (회의비 3식)
임중서	\$160 X 5박 = \$800 이내 사후정산	\$30 X 6일 = \$180	(\$78 X 6일)-52 = \$416	\$596	식비 2회 차감 (회의비 2식)
합계				\$1,309	

* 상급자 동행출장으로 선임연구위원급 식비 및 숙박비 적용 (임중서)

- 재정정보시스템 내 일비 및 식비 자동 환율 계산 미적용으로 원화 수기 기입

* 남정호 - 일비: \$245=322,800원 / 식비: \$468=616,600원

- 환율 : 1\$=1,317.56원 (출장일 6.11이 휴일로, 6.12 최초고시 환율적용 / 6.9보다 환율 적음)

* 임중서 - 일비: \$180=237,100원 / 식비: \$416=548,100원

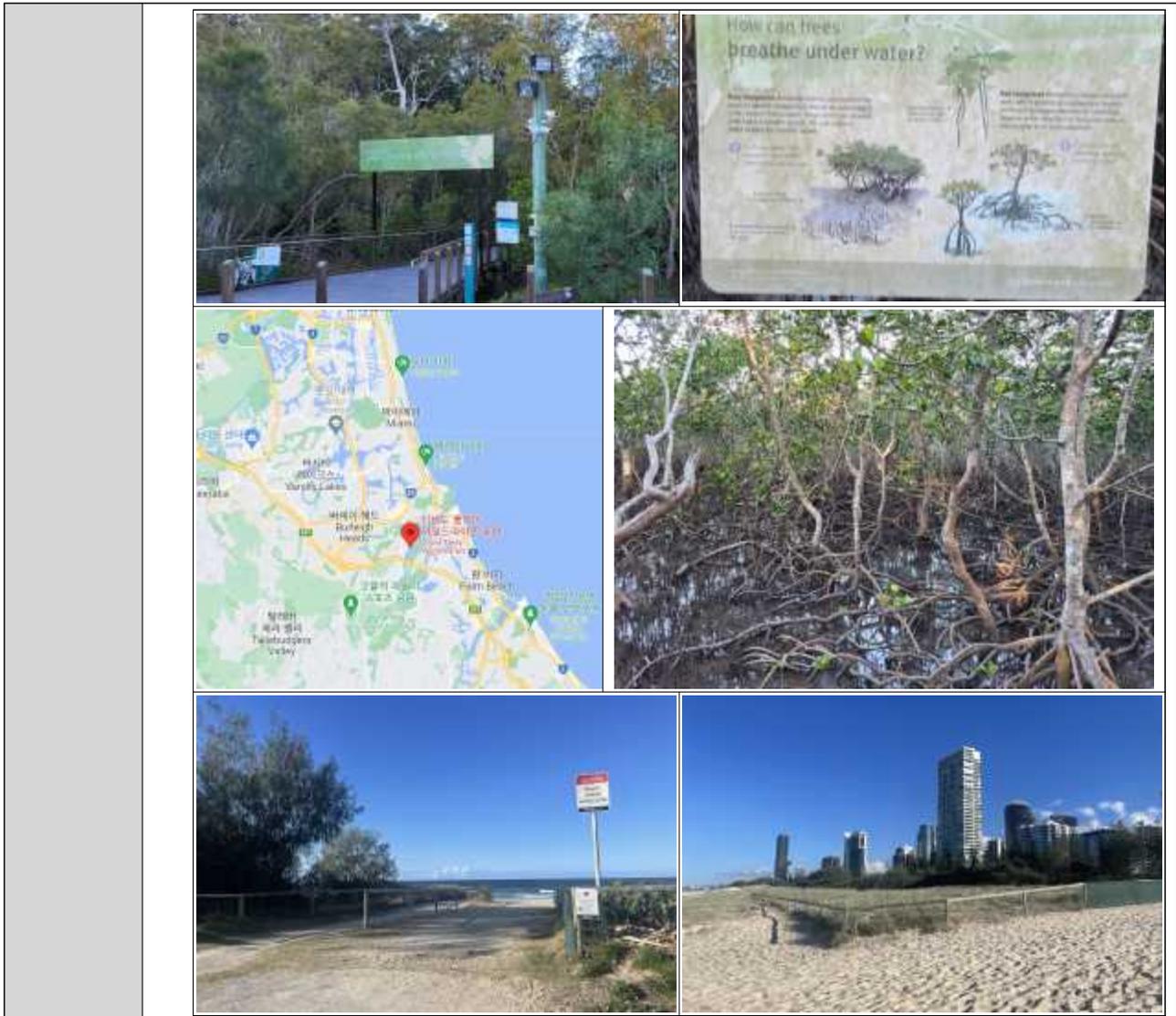
- 환율 : 1\$=1,317.56원 (출장일 6.12 최초고시 환율)

기준일 : 2023년06월12일 고시회차 : 1회차 고시시간 : 08시23분48초

조회시각 : 2023년06월21일 08시00분23초

동회	환차				송금		T/C 사실때	외화 수표 파실때	매매 기준율	환가 료율	미화 환신율
	사실 때		파실 때		보낼 때	받을 때					
	환율	Spread	환율	Spread							
미국 USD	1,317.56	1.75	1,272.24	1.75	1,307.50	1,282.30	0.00	1,279.79	1,294.90	6,99562	1,0000

주요 업무내용 (계획(), 결과(√))



업무③	6.14.(수) EcoSummit Congress 발표 및 주요 세션 참석
수행계획	<ul style="list-style-type: none"> □ Coastal marine habitats 및 포스터 세션 발표 <ul style="list-style-type: none"> - Coastal marine habitats 세션: 구두발표(남정호) 발표명: Will South Korea have mangrove forests under accelerated climate change? - 포스터 세션: 포스터발표(임중서) 발표명: Paradoxical ripple effect of geopolitics and natural hazards-driven land cover change on coastal wetlands in North Korea □ 주요 세션 참석 및 연구 동향 파악 <ul style="list-style-type: none"> - (오전) Climate change impacts to ecosystem services and potential management responses - (오후) Restoring marine, coastal and estuary ecosystems for a sustainable future
수행결과	<ul style="list-style-type: none"> □ Coastal marine habitats 세션 발표 <ul style="list-style-type: none"> ○ Will South Korea Have Mangroves Forests under Accelerated Climate Change? <ul style="list-style-type: none"> - 기후변화 적응력 향상을 위해 생태계서비스 등 다양한 측면에서 긍정적 파급효과를 제공하는 서식지의 경우 관리가능한 수준에서의 mitigation 방안 마련을 모색할 필요가 있음 - 전구모델과 RCP8.5시나리오를 이용하여 수온, 기온 예측(projection) - 장래 수온, 기온 변화에 따라 망그로브 국내 서식가능 시기 예측 - 메타분석을 활용하여 연안생태계 변화에 따른 생태계서비스(편익) 변화 추정

주요 업무내용 (계획(), 결과(✓))

4th INTERNATIONAL ECOSYSTEM BUILDING A SUSTAINABLE AND DESIRABLE FUTURE

15-17 June 2011

Will South Korea Have Mangroves Forests under Accelerated Climate Change?

Jungho NAM, Jung Sun YIM, Jun Young PARK, Dong-Gu KWON, Jung Seung YOON

Outline of Presentation

1. Introduction: Climate change & Biodiversity
2. Methods
3. Results
4. Discussion & Conclusion

Methods

Air and Sea surface temperature

Annual & winter mean temperature change (10 year-average)

Surface Air

Sea Surface

Methods

Growth conditions of mangrove species

Mangrove habitat: IUCN Red List of Threatened Species Data

- Distribution around the 2010: K. Obovata, A. Marina, R. Stylosa

- Estimated climate conditions of northern marginal habitats in 2010s

Species	Site	WT	WC	WC	WC	WC	WC
Rhizophora Obovata	R1	23.0	15.3	10.6	10.6		
	R2	24.7	15.3	21.0	10.6		
	R3	26.3	20.4	25.2	10.6		
	R4	23.1	15.0	17.0	11.0		
	R5	23.0	15.9	10.1	12.0		
Avicennia Marina	A1	20.4	11.8	14.4	14.4		
	A2	24.7	15.0	21.5	10.6		
	A3	26.3	22.4	23.2	10.6		
	A4	24.3	20.0	21.1	10.0		
	A5	25.0	20.0	23.0	10.0		
Rhizophora Stylosa	R1	24.7	13.7	20.2	10.0		
	R2	25.0	21.7	22.0	10.0		
	R3	27.0	25.7	24.2	20.0		
	R4	25.0	20.0	23.0	10.0		
	R5	25.0	20.0	22.0	17.0		

Results

Northern habitat margin of Rhizophora Obovata

Annual mean temperature

Winter mean temperature

2011-2020, 2021-2030, 2031-2100

Results

Northern habitat margin of Avicennia Marina

Annual mean temperature

Winter mean temperature

2011-2020, 2021-2030, 2031-2100

Results

Northern habitat margin of Rhizophora Stylosa

Annual mean temperature

Winter mean temperature

2011-2020, 2021-2030, 2031-2100

Discussion & Conclusion

Mangroves introduction: more MES

Ecosystem Services values of Mangrove forests (25x10¹⁰ USD Km²yr⁻¹), 1.5 times higher than bare-soil 50M wetland

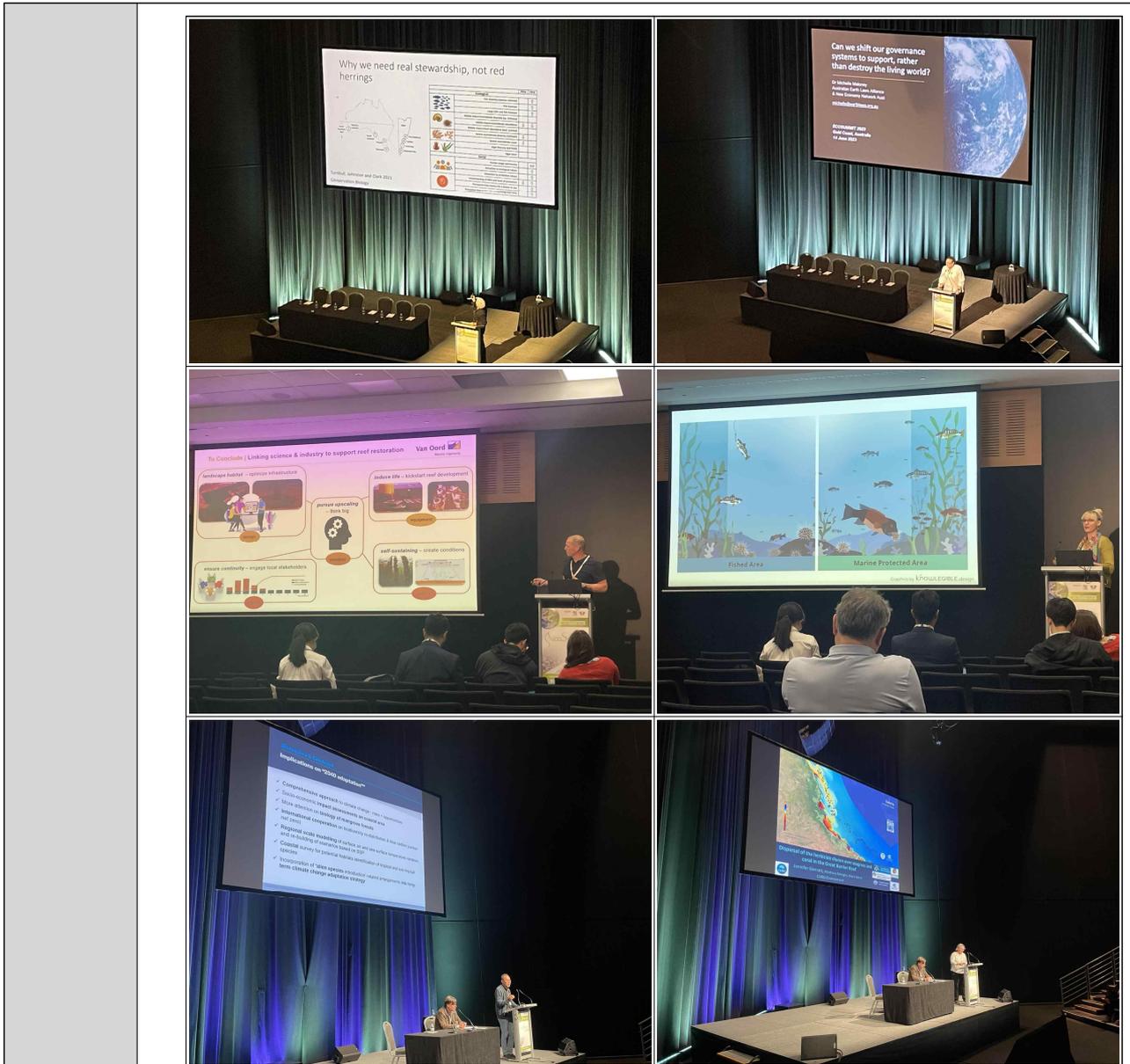
Species	Planting												Recovery												Sowing												Other												
	10	20	30	40	50	60	70	80	90	100	110	120	10	20	30	40	50	60	70	80	90	100	110	120	10	20	30	40	50	60	70	80	90	100	110	120	10	20	30	40	50	60	70	80	90	100	110	120	
Avicennia Marina	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Rhizophora Obovata	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Rhizophora Stylosa	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

주요 업무내용 (계획(), 결과(√))

□ 주요 세션 참석 및 연구 동향 파악

- P1 - The Future of our oceans - stewardship and sustainability in a time of Great acceleration
 - 해양의 다양한 부문에서 발생하는 "심각한 가속화"가 생태계 및 사회경제에 미치는 파급효과에 대한 문제제기를 시작으로, 기존 인류사회의 vicious cycle을 대체할 수 있는 virtuous cycle로 전환하기 위한 방안들을 중점적으로 소개
 - 과학자 중심의 연구 및 red herrings를 벗어나 일반인과 사회 전체가 동행하는 real stewardship의 정착을 촉구하고, 대표적인 사례인 호주의 State of Environment를 소개함. 또한, 중장기적 well-being 추구가 지속가능성 확보와 직접적으로 연결된 사안임을 상기함.
- P2 - Can we shift our governance systems to support, rather than destroy, the living world?
 - 직전 발표와 연계하여, 기존 인류사회의 주된 가치관과 법제도, 그리고 이들의 근간인 의사결정 체계(governance)에 대한 문제제기를 통해 자연중심적, 지역적(local) 거버넌스 체계로의 전환 필요성을 촉구
 - Pizza dilemma를 예로 들어, 사회적으로 형성된 가치를 지불하는 사람에게 결정권을 부여하거나 잔여 편익을 제공하는 관행에 대한 문제제기
- S5 - Advancing marine reef restoration by linking science & industry
 - 연안복원이 중·장기적으로 효율적·효과적으로 지속되기 위해서는 과학적 연구가 현실에서 실천가능한 형태로 나아가야 함. 특히 기업(시장)과 연계할 수 있어야하며, 이를 실현하기 위한 대표적인 원칙을 다섯 가지로 요약하여 제시
 - (1)대규모화를 추구: 소규모 사례연구가 아닌, 대규모 인력과 장비의 투입을 전제로 설계
 - (2)거시적 경관조성: 인공어초 및 구조물 투입이 아닌 대규모로 자연친화적 인프라를 조성
 - (3)생태적 관점: 환경만 조성하는 것이 아닌, 생물이 서식하고 번식하도록 지원하는 데 초점
 - (4)자기지속가능성 지원: 일시적인 조작용이 아닌 장기적으로 생태계 스스로 유지하도록 기여
 - (5)지속성 확보: 단기적인 연구 중심의 예산 편성이 아닌 장기적인 이해관계자 참여를 보장
- S5 - Can MPAs enhance the benefits of kelp restoration for coastal communities?
 - 해양생태계 복원은 생태계서비스 등 편익을 극대화할 수 있는 적합지 탐색을 전제해야 함.
 - 적합지 탐색 시 예상 편익의 추정은 해양보호구역 지정 등 관리방안에 따라 상이하므로, 관리수단별 예상 편익을 정교하게 추정할 필요가 있음. 이 연구는 사례를 통해 생태계 복원 및 절대보호구역 지정의 효과를 조사
 - 연구 결과, 주요 생물군의 개체량 및 종다양성이 증가하였으나 어업생산량은 감소하는 등 생태계 및 사회경제적 파급효과가 복합적임. 또한 기존에 건강성(생물다양성)이 높은 생태계는 보호구역 지정에 따른 편익 수준이 감소함. 이는 보호구역의 지정이 반드시 효과적인 관리수단은 아니며 공간분석 등을 통한 관리수단별 적합지 선정이 중요함을 방증함
- S11 - Using eReefs to determine how the Great Barrier Reef is being impacted by anthropogenic stressors and how to manage them
 - 호주 대보초연안 관리를 목적으로 대기-육상-해양의 다양한 항목별 데이터와 모듈을 결합한 예측모델인 eReefs의 개발 및 고도화 성과를 소개
 - 특히 대보초 연안의 수질관리를 위해 모델의 공간해상도 및 신뢰도에 큰 진전이 있었으며, 이를 토대로 다양한 환경·인위적 변화 시나리오에 따른 수질변화 모의를 수행하여 적절한 관리방안을 도출
 - 데이터 통합적 모델링을 통해 위성영상 등 일부 데이터에 포함된 결측치를 보완하여 클로로필 농도 등 필요한 정보를 연속적인 수치로 산출 가능

주요 업무내용 (계획(), 결과(✓))



업무④

6.15.(목) EcoSummit Congress 발표 및 주요 세션 참석

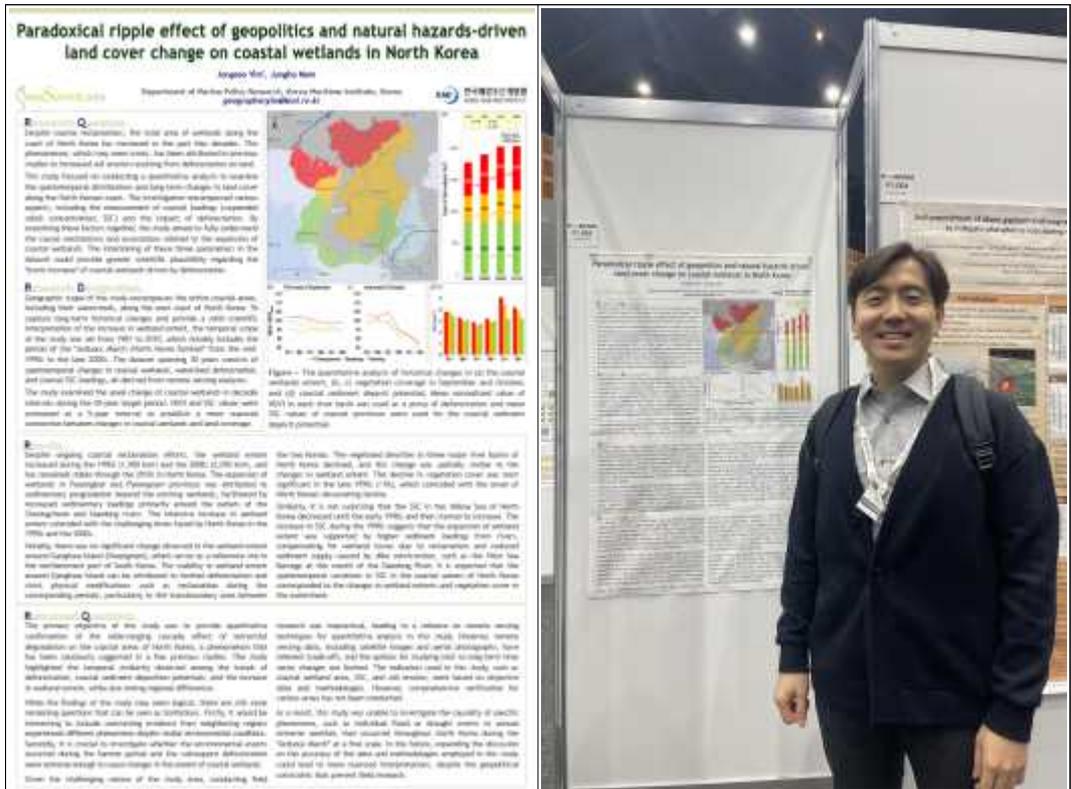
수행계획

- 포스터 세션 발표
 - 포스터 세션: 포스터발표(임종서)
 - 발표명: Paradoxical ripple effect of geopolitics and natural hazards-driven land cover change on coastal wetlands in North Korea
- 주요 세션 참석 및 연구 동향 파악
 - (오전) Ecosystem services
 - Aboriginal rights and land use
 - (오후) Integrating socio-economics and ecology
 - Sustainability and resilience
 - Climate change and coastal cities
 - Nature-based coastal defence: developing the knowledge needed for wider implementation

주요 업무내용 (계획(), 결과(✓))

□ 포스터 세션 발표

- Paradoxical ripple effect of geopolitics and natural hazards-driven land cover change on coastal wetlands in North Korea
 - 고난의행군(1990~2010) 시기 북한 육상지역의 식생황폐화 및 토양침식 증가가 연안생태계에 미친 영향을 사례로 육상-해양생태계의 상관성을 분석하고 통합관리의 필요성을 환기
 - 위성영상을 활용하여 육상부 산림황폐화(NDVI), 토양침식 및 연안해역 유입(SSC), 연안생태계 영향(갯벌 분포) 등 3종의 지표에 대한 장기적(1980년대~2010년대) 시공간 분석을 수행
 - 북한의 육상생태계 손실에 따른 연안생태계 증대를 토지피복 인공화, 하구둑 조성 및 해안선 고정 등으로 인해 조간대 손실이 지속적으로 발생하는 우리나라의 연안생태계와 대조하여 시사점을 제시



수행결과

□ 주요 세션 참석 및 연구 동향 파악

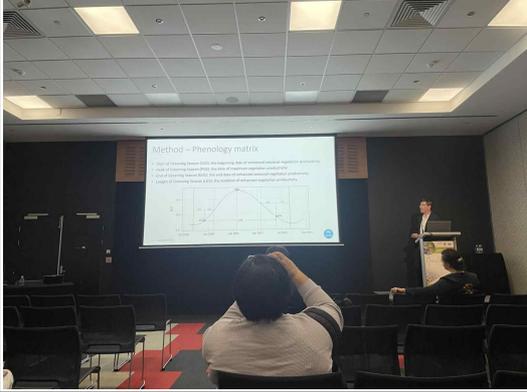
- P4 - Natural prosperity, wellbeing and the universal value of nature
 - 시장 또는 자본중심적 관점에서 자연중심적 관점으로의 전환이 경제학적 가치관과 괴리되지 않도록, 자연-환경-생태계를 경제학적 가치관에 포괄할 수 있는 관점의 필요성을 역설. 이를 위해 국가와 지역 및 민족에 무관하게 공감대를 형성할 수 있는 공통된 가치가 필요.
 - Natural prosperity와 planetary awareness의 확산을 위해 지속가능한 well-being과의 연결성을 공고히 하고, 시민사회로의 확산에 힘써야 함.
- S24 - A quantitative measure of 'social license to operate'
 - 해양공간의 이용에 필요하며, 정부나 국가로부터 얻는 허가권과 분리된 사회적 허가(social license), 즉 수용 수준을 정량적으로 분석하는 틀과 방법론을 제시
 - 사회적 허가의 충족요건은 (1)의사결정 과정에 직접적으로 참여한 참여자간의 합의 또는 상충 수준과 (2)참여자의 의견을 수렴한 평균적인 의견임. 이를 부채꼴 형태의 다이어그램으로 표현할 수 있는데, 부채꼴의 세로축은 참여자의 합의 수준, 가로축은 평균 의견을 의미함.

주요 업무내용 (계획(), 결과(✓))

- 부채꼴을 대략적으로 구역화하는 경우 중심축에서 가까운 부분은 합의 수준이 낮아 유의미한 결론을 도출하지 못한 것으로 판단할 수 있으며, 부채꼴 바깥 부분 중 우측의 경우 합의 수준과 평균 의견 모두 특정 이용행위에 대해 긍정적인 '사회적 합의에 도달한' 영역으로써 정량적으로 평가할 수 있음.
- S38 - Value of blue and green space for our mental and physical health and wellbeing: Drawing on the First Nations Social and Emotional Well-being (SEWB) framework
 - 시민의 정신건강 및 복지 향상 필요성과 결합하여 블루 및 그린 스페이스 유지 방안을 모색
 - 호주의 경우 기후변화에 대한 시민사회의 우려가 심각하며, 이는 정신건강에도 악영향을 미치고 있음. 역설적으로 기후변화로 인해 소실되었거나, 소실될 것으로 우려되는 블루 및 그린 스페이스에 대한 사회적 수요가 급격하게 증가함.
 - 따라서 현 시점에서 블루 및 그린스페이스의 조성은 과거와 달리 환경·생태계 복원에만 그 효용이 있는 것이 아니라, 복지 및 웰빙과 연관성이 높아지고 있으며, 사회적 수요와 인식의 변화에 발맞춰 블루 및 그린스페이스 확충을 위한 동력을 얻을 수 있을 것으로 기대
- S38 - Climate change, coastal erosion, and beachfront developments: planning for community resilience
 - 인구의 85%가 연안(해안선 50km 이내)에 거주하는 호주는 약 50년 뒤에 해수면 변화에 따른 피해 저감 및 적응에 소요될 국가 재정 지출이 약 300억 달러에 달할 것으로 추계
 - 이 연구는 Wamberal Beach를 대상으로 학계의 과학적 예측 및 대응방안의 우선순위 설정이 현실에 적용되지 않는 현상을 지적하고 변환을 촉구하는 것에 목적을 둬. 연구지역은 1978년 이후 지속적인 침식피해에 대한 비용효율적 적응 대책이 해안선 및 배후지 후퇴로 평가하였으나, 현재까지 연안지역의 개발 및 인공호안의 건설은 반복되고 있음
 - 장기적으로 연안역의 탄력성 확보 및 유지를 위한 변화 촉구는 연안에 거주함으로써 경관을 누리는 것에 대한 대중의 관념에 대한 전환을 동반해야 함. 이는 양빈 및 호안 조성이 결과적으로 연안생태계의 파괴를 야기하므로, 해안선 고정을 위한 연안거주민의 사적이익 추구를 과거 모피의 소비와 같은 윤리 및 도덕적 문제제기와 유사하게 문제제기를 할 수 있음.



주요 업무내용 (계획(), 결과(✓))

<p>업무⑤</p>	<p>6.16.(금) EcoSummit Congress 주요 세션 참석</p>
<p>수행계획</p>	<ul style="list-style-type: none"> □ 주요 세션 참석 및 연구 동향 파악 - (오전) Ecosystem health Sustainability and resilience of cities - (오후) Sustainability and resilience of cities Environmental policies and framework Disturbance ecology & Ecological complexity
<p>수행결과</p>	<ul style="list-style-type: none"> ○ P6 - Societal therapy for a sustainable wellbeing future <ul style="list-style-type: none"> - 오늘날은 인간과 생태계의 조화 및 이를 토대로 인류문명의 지속을 지향하는 유사한 개념과 학문적 접근이 분절된 상태로 포화됨. 따라서 이러한 분절들을 하나로 묶을 수 있는 새로운 지향점(vision)을 제시할 필요가 있음. 이 강연은 전술한 문제제기를 통해 새로운 지향점 제시를 위한 공동의 노력을 촉구함. ○ S46 - Spatial and temporal assessment of floodplain vegetation response to floods <ul style="list-style-type: none"> - 연안에 위치한 범람원의 기후 및 수문환경 변화에 따른 식생생태계 반응을 정량적으로 조사 - 위성영상의 시계열 분석에 기초한 이 연구는 서식지를 수몰지와 비수몰지로 구분하고 식생의 광합성 및 성장주기 등을 분석하였는데, 향후 우리나라 염습지 또는 갯벌에 적용할 경우 소조기와 대조기 또는 해수면 상승과 연관지어 서식지 환경을 분류하고, 생지화학적 분석 또는 가치평가 등을 수행하여 연안관리에 시사점을 얻을 수 있을 것으로 기대 ○ S46 - An assessment of future collapse risk for Finnish aapa mire wetlands under the Red List of Ecosystems protocol <ul style="list-style-type: none"> - 핀란드 연안에 위치한 소택지(peat)를 사례로 기후변화에 따른 서식지 위험도를 정량적으로 평가함. - 직전 발표와 연계하여 기후변화 등과 연관된 서식지 변화를 정량화하는 방법론 개발 및 활용에 기여할 것으로 기대 <div style="display: flex; flex-wrap: wrap;">     </div>

주요 업무내용 (계획(), 결과(✓))

업무⑥	업무 협의(3회)
수행계획	<ul style="list-style-type: none"> □ NbS를 활용한 기후변화 대응 방향 : 6.13일 □ 기후변화에 따른 망그로브 서식지 확산 및 연안관리 시사점 : 6.14일 □ 육상기인 퇴적물 공급의 하구역 및 연안습지 관리 시사점 논의 : 6.16일
수행결과	<ul style="list-style-type: none"> ○ NbS를 활용한 기후변화 대응방향 <ul style="list-style-type: none"> - 일시 및 장소 : 6.13일 오전 10시~오후 3시(사구지역 및 망그로브 지역) - 참석자 : 남정호, 권봉오(군산대), 김종성(서울대), 이종민(서울대) - 주요 회의 내용 <ul style="list-style-type: none"> • 자연기반 해법이 기후변화 대응(탄소중립 및 자연재해 대응), 연안경제 활성화(생태관광)에 기여한다는 것을 국제사회는 인식하고, 이에 대한 국가 및 지역 차원의 정책을 개발, 실행 중 • 이번 2023 Ecosummit도 이를 반영하듯이 NbS 관련 연구발표가 주를 이루고 있고, 전체 세션회의에서도 이 개념을 활용한 지속가능발전 등을 다루었음. • 우리나라에서 NbS 개념은 아직 정책목표 또는 법률에 기반한 사업으로 설정되거나 수행되고 있지 않지만, 블루카본 정책, 탄소중립 정책에서 부분적으로 반영되었음. • 현안은 NbS에 대한 사회적 인식이 이제 형성단계에 있다는 것이고, 이를 제도적으로 뒷받침할 법제도 정비 수준, 사업예산 확보 수준이 높지 않다는데 있음. • 장기적으로 NbS의 효과성과 효용성을 연구를 통해 입증하고, 이를 활용하여 국민과 주요 정책결정자들의 인식을 제고하는 것이 필요함 ○ 기후변화에 따른 망그로브 서식지 확산에 따른 대응 시사점 <ul style="list-style-type: none"> - 일시 및 장소 : 6.14일 오후 4:30~6:00, 골드코스트 컨벤션 센터 - 참석자 : 남정호, 임종서, 김성은(아라), 왕순영(E&C), 권봉오(군산대), 김종성(서울대), 이종민(서울대), 손수진(선도) 등 20여명 - 주요 회의 내용 <ul style="list-style-type: none"> • 2018년 보고서와 2021년 보고서를 비교한 결과, 기후변화속도가 10년 더 빨라지고 있는 것으로 나타났음. • 2021년 보고서에 사용한 CMIP 모델 이전 버전과 RCP를 활용한 모델에 따르면 우리나라에 망그로브는 빠르면 2040년에 서식할 수 있는 것으로 연구되었음. RCP를 대체하여 SSP를 활용하고, 2021년 보고서의 더 빨라진 기후변화 속도를 반영할 경우 우리나라의 망그로브 서식가능 환경은 2040년보다 더 빨라질 가능성을 배제할 수 없음. • 현단계 NbS에 대한 논의가 시작되고 있지만, 기후변화 예측모델을 활용하여 우리나라 생태계변화를 체계적으로 예측하고 이를 정책에 활용하기 위한 노력은 미흡한 상태임. • 특히 외래종 유입(자연적, 인위적)에 따른 우리나라 해양생태계 대응 정책의 변화도 필요한바, 외래종을 유해종으로 인식하는 것보다는 외래종 유입에 따른 비용과 편익을 과학적으로 연구하고 이에 적극적으로 대응하는 정책을 개발하거나 정책전환이 필요함 ex) 갯끈풀 • 또한 현재 기업 중심으로 NbS, 블루카본 등에 대한 식재기술에 관한 연구개발이 진행중이지만, 망그로브의 식재 기술 전문가가 전무한 바, 미래 환경변화에 대응할 수 있는 다양한 전문가를 양성할 필요가 있음.

주요 업무내용 (계획(), 결과(√))

□ 육상기인 퇴적물 공급의 하구역 및 연안습지 관리 시사점

- 일시 및 장소 : 6.16일 오후 4:30~6:00, 골드코스트 컨벤션 센터
- 참석자 : 남정호, 임종서, 황철희(MEI), 왕순영(E&C), 장갑수(사수카툰대), 김종성(서울대), 이정현(서울대), 권봉오(군산대), 손수진(선도) 등 20여명
- 주요 회의 내용
 - 국내 17개 국가하천 중 자연형 하천을 유지하고 있는 하천은 섬진강, 형산강, 태화강 등 일부에 불과하고, 대부분 인공구조물에 의해 하천과 해양이 단절된 상태로 유지
 - 해양-하천의 생태적 연결성이 자연형 하구에 비해 높지 않고, 일방향으로만 영향을 주는 인공구조물 설치 하구에 대한 관리는 육상개발의 진행, 기후변화에 따른 강수량 변화의 영향을 고려하여야 함.
 - 2019년에 새만금 연안해역에서 발생한 빨곶현상은 기후변화에 따른 강수량 증가와 육상 퇴적물의 공급, 수온상승에 따른 플랑크톤 대번식과 맞물려 발생한 것으로 판단됨. 빨곶으로 인해 조업활동이 불가하여 어민 피해가 발생한 것도 고려해야 할 요소임
 - 따라서 향후 하구역 관리에서 기후변화에 따른 육상퇴적물의 유입과 하구역의 해양환경 변화, 수산업의 영향을 통합적으로 연계하여 관리하는 것이 필요함.
 - 한편, 낙동강의 하구역 부분 개방에 따라 육상기인 퇴적물 공급양상이 달라지고 이에 따라 낙동강 하구역의 자연지형(등애, 모래톱)의 변화도 예상되는바, 연안습지관리도 육상기인 퇴적물의 영향을 통합적으로 고려하는 LOICZ(Land-Ocean Interaction in Coastal Zone) 틀을 활용할 필요가 있음.

제1회 한-호주 블루카본 전문가 워크숍

□ **세미나 목적**

- 신규 탄소흡수원 인증관련 블루카본사업단의 선도적 역할 강화
- 갯벌을 포함한 신규 블루카본의 국제인증을 위한 네트워크 기반 구축

□ **세미나 개요**

- 제 목: 제1회 한-호주 블루카본 전문가 워크숍
- 일 시: 2023. 6. 12.(월), 14:00~17:00
- 장 소: 호주 골드코스트 Sofitel 호텔 Sovereign 룸
- 참석자: 30여명(국내·외 유관기관)

□ **주요 일정(안)**

시간	내 용	비고
13:30~14:00	30' 등록	
개회식		
14:00~14:05	5' 내빈소개	
14:05~14:15	10' 개회사	김종성 단장 (블루카본사업단)
14:15~14:25	10' 기념촬영	
14:25~14:30	5' 자리배치 및 휴식	
세션 1 : 주제발표		
14:30~14:50	20' 발표 1: 한국 갯벌 블루카본 연구	이종민 박사 (블루카본사업단)
14:50~15:10	20' 발표 2: 한국 신규 블루카본 연구	권봉오 교수 (국립군산대학교)
15:10~15:30	20' 발표 3: 한국 블루카본 및 탄소중립 정책방향	남정호 박사 (한국해양수산개발원)
15:30~15:50	20' 자유토의 및 휴식	
세션 2 : 종합토론		
15:50~16:50	60' 종합토론 (참석자: 주제발표자 등)	(좌장) 장갑수 교수 (캐나다 사스캐처원대학교)
16:50~17:00	10' 폐회사	김종성 단장 (블루카본사업단)

[별첨 2] EcoSummit Congress Program(일자별 세션 구성)

JUNE GMT+10 14																
08:00																
08:30	08:30-09:30 Opening Session Arena 1B Presentation type: Oral 08:30-08:45 Welcome to the country 08:45-09:00 Welcome to the conference 09:00-09:30 Opening address															
09:30	09:30-10:00 Plenary Speaker 1: Emma Johnston, The University of Sydney, Australia Arena 1B Presentation type: Oral															
10:00	10:00-10:30 Plenary Speaker 2: Michelle Maloney, Australian Earth Laws Alliance (AELA), Australia Arena 1B Presentation type: Oral															
10:30	10:30-11:00 Refreshment Break Hall 1															
11:00	<table border="0"> <tr> <td> 11:00-12:30 Session 1: Coastal development and engineering Arena 1B Presentation type: Oral </td> <td> 11:00-12:30 Session 2: Marine ecology Arena 1A Presentation type: Oral </td> <td> 11:00-12:30 Session 3: Coral reef stressors Meeting Room 5 Presentation type: Oral </td> <td> 11:00-12:30 Session 4: Rivers, catchments and wetlands Meeting Room 6 Presentation type: Oral </td> <td> 11:00-12:30 Session 5: Symposium - Restoring marine, coastal and estuary ecosystems for a sustainable future Meeting Room 7 Presentation type: Oral Nathan Waltham </td> <td> 11:00-12:30 Session 6: Symposium - Coupled human and natural ecosystems for sustainability Meeting Room 8 Presentation type: Oral Jie Gong </td> <td> 11:00-12:30 Session 7: Symposium - Providing Solutions to a Current Environmental Problem Facing our changing world: Improving methods and models used to measure and scale evapotranspiration (ET) to the landscape scale in urban regions, catchments and wetlands Meeting Room 9 Presentation type: Oral Pamela Nagler </td> <td> 11:00-11:45 Session 8: Symposium - Currents: Navigating positive connections between oceans and human health Meeting Room 4 Presentation type: Oral Catherine Pirke </td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td> 11:45-12:30 Session 9: Symposium - Climate change impacts to ecosystem services and potential management responses Meeting Room 4 Presentation type: Oral Janet Cushing </td> </tr> </table>	11:00-12:30 Session 1: Coastal development and engineering Arena 1B Presentation type: Oral	11:00-12:30 Session 2: Marine ecology Arena 1A Presentation type: Oral	11:00-12:30 Session 3: Coral reef stressors Meeting Room 5 Presentation type: Oral	11:00-12:30 Session 4: Rivers, catchments and wetlands Meeting Room 6 Presentation type: Oral	11:00-12:30 Session 5: Symposium - Restoring marine, coastal and estuary ecosystems for a sustainable future Meeting Room 7 Presentation type: Oral Nathan Waltham	11:00-12:30 Session 6: Symposium - Coupled human and natural ecosystems for sustainability Meeting Room 8 Presentation type: Oral Jie Gong	11:00-12:30 Session 7: Symposium - Providing Solutions to a Current Environmental Problem Facing our changing world: Improving methods and models used to measure and scale evapotranspiration (ET) to the landscape scale in urban regions, catchments and wetlands Meeting Room 9 Presentation type: Oral Pamela Nagler	11:00-11:45 Session 8: Symposium - Currents: Navigating positive connections between oceans and human health Meeting Room 4 Presentation type: Oral Catherine Pirke							11:45-12:30 Session 9: Symposium - Climate change impacts to ecosystem services and potential management responses Meeting Room 4 Presentation type: Oral Janet Cushing
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12:30	12:30-13:15 Lunch Hall 1															
13:15	13:15-14:30 Poster Session 1 Hall 1 Presentation type: Poster															
14:30	14:30-15:20 Plenary Panel 1: Finding a Future for Corals Arena 1B Presentation type: Oral Panelists: John Veron, "Godfather of Coral", Corals of the World Morgan Pratchett, ARC Centre of Excellence for Coral Reef Studies, Australia Emily Howells, Southern Cross University, Australia															
15:30	15:30-16:00 Refreshment Break Hall 1															
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17:00																
17:30																
17:45																
18:00																
19:00	19:00-21:00 Networking and Fundraising Event in Honour of Sylvia Earle's Mission Blue Gold Coast Hope Spot SkyPoint, Surfers Paradise															
21:00																

[별첨 2] EcoSummit Congress Program(일자별 세션 구성) - 계속

JUNE GMT+10 15									
08:30	08:30-09:00 Plenary Speaker 3: Jigmi Y. Thinley, Prime Minister of Bhutan (2008-2013) / World Leadership Alliance - Club de Madrid / Asian Peace and Reconciliation Council Arena 1B Presentation type Oral								
09:00	09:00-09:30 Plenary Speaker 4: Jacqueline McGlade, University College London, UK Arena 1B Presentation type Oral								
09:30	09:30-10:00 Refreshment Break Hall 1								
10:00	<table border="1"> <tr> <td>10:00-11:30 Session 19: Ecosystem services Arena 1B Presentation type Oral</td> <td>10:00-11:30 Session 20: Aboriginal rights and land use Arena 1A Presentation type Oral</td> <td>10:00-11:30 Session 21: Ecological economics Meeting Room 5 Presentation type Oral</td> <td>10:00-11:30 Session 22: Symposium - A model for sustainable coastal landscapes: policies, programs, and strategies from the University of Florida, Florida-Friendly Landscaping™ Meeting Room 6 Presentation type Oral Gail Marie Hansen De Chapman</td> <td>10:00-11:30 Session 23: Ecosystem creation and restoration Meeting Room 7 Presentation type Oral</td> <td>10:00-11:30 Session 24: Symposium - Network models inform interdisciplinary research in sustainability and resilience Meeting Room 8 Presentation type Oral Brian Fahs</td> <td>10:00-11:30 Session 25: Working Group - Ecosystem-based management of deep-sea mining Meeting Room 9 Presentation type Oral Jayden Hyman</td> <td>10:00-11:30 Session 26: Working Group - Creating appetite for climate action - the future is now Meeting Room 4 Presentation type Oral Rachel Kelly</td> </tr> </table>	10:00-11:30 Session 19: Ecosystem services Arena 1B Presentation type Oral	10:00-11:30 Session 20: Aboriginal rights and land use Arena 1A Presentation type Oral	10:00-11:30 Session 21: Ecological economics Meeting Room 5 Presentation type Oral	10:00-11:30 Session 22: Symposium - A model for sustainable coastal landscapes: policies, programs, and strategies from the University of Florida, Florida-Friendly Landscaping™ Meeting Room 6 Presentation type Oral Gail Marie Hansen De Chapman	10:00-11:30 Session 23: Ecosystem creation and restoration Meeting Room 7 Presentation type Oral	10:00-11:30 Session 24: Symposium - Network models inform interdisciplinary research in sustainability and resilience Meeting Room 8 Presentation type Oral Brian Fahs	10:00-11:30 Session 25: Working Group - Ecosystem-based management of deep-sea mining Meeting Room 9 Presentation type Oral Jayden Hyman	10:00-11:30 Session 26: Working Group - Creating appetite for climate action - the future is now Meeting Room 4 Presentation type Oral Rachel Kelly
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11:30	11:30-12:30 Plenary Panel 2: Transformation to a Sustainable and Desirable Future Arena 1B Presentation type Oral Panelists: Kate Auly, Professional Fellow, University of Melbourne, Australia Jacqueline McGlade, University College London, UK Lorenzo Fioramonti, Chamber of Deputies, Italy Jigmi Y. Thinley, former Prime Minister of Bhutan (2008-2013) / World Leadership Alliance - Club de Madrid / Asian Peace and Reconciliation Council								
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18:00									

[별첨 2] EcoSummit Congress Program(일자별 세션 구성) - 계속

JUNE 16									
GMT+10									
08:30	08:30-09:00 Plenary Speaker 5: Robert Costanza, Institute for Global Prosperity, University College London, UK Arena 1B Presentation type: Oral								
09:00	09:00-09:30 Plenary Speaker 6: Bojie Fu, Chinese Academy of Sciences, China Arena 1B Presentation type: Oral								
09:30	09:30-10:00 Refreshment Break Hall 1								
10:00	<table border="1"> <tr> <td>10:00-11:30 Session 43: Climate adaptation and mitigation Arena 1B Presentation type: Oral</td> <td>10:00-11:30 Session 44: Sustainability and resilience Arena 1A Presentation type: Oral</td> <td>10:00-11:30 Session 45: Climate change and carbon neutrality Meeting Room 5 Presentation type: Oral</td> <td>10:00-11:30 Session 46: Ecosystem health Meeting Room 6 Presentation type: Oral</td> <td>10:00-11:30 Session 47: Symposium - Imagining and planning for uncertain water futures – perspectives on capabilities, ethics, decision-contexts and youth engagement Meeting Room 7 Presentation type: Oral Carla Alexandra</td> <td>10:00-11:30 Session 48: Sustainability and resilience of cities Meeting Room 8 Presentation type: Oral</td> <td>10:00-11:30 Session 49: Working Group - Developing an environmental sports field management academy and engaging managers to environmentally certify sports field facilities. Meeting Room 9 Presentation type: Oral Alex Lindsey</td> <td>10:00-11:30 Session 50: Working Group - Satellite-based radar model for illegal discharges at the Eastern Tropical Pacific Marine Ecoregion according to MARPOL/73_78 Annex I Meeting Room 4 Presentation type: Oral Ana Halabi-Echeverry</td> </tr> </table>	10:00-11:30 Session 43: Climate adaptation and mitigation Arena 1B Presentation type: Oral	10:00-11:30 Session 44: Sustainability and resilience Arena 1A Presentation type: Oral	10:00-11:30 Session 45: Climate change and carbon neutrality Meeting Room 5 Presentation type: Oral	10:00-11:30 Session 46: Ecosystem health Meeting Room 6 Presentation type: Oral	10:00-11:30 Session 47: Symposium - Imagining and planning for uncertain water futures – perspectives on capabilities, ethics, decision-contexts and youth engagement Meeting Room 7 Presentation type: Oral Carla Alexandra	10:00-11:30 Session 48: Sustainability and resilience of cities Meeting Room 8 Presentation type: Oral	10:00-11:30 Session 49: Working Group - Developing an environmental sports field management academy and engaging managers to environmentally certify sports field facilities. Meeting Room 9 Presentation type: Oral Alex Lindsey	10:00-11:30 Session 50: Working Group - Satellite-based radar model for illegal discharges at the Eastern Tropical Pacific Marine Ecoregion according to MARPOL/73_78 Annex I Meeting Room 4 Presentation type: Oral Ana Halabi-Echeverry
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11:30	11:30-12:30 Plenary Panel 3: Ecocivilisation Arena 1B Presentation type: Oral Panelists: Robert Costanza, Institute for Global Prosperity, University College London, UK Xi J. Peking University, China B. Larry Li, University of California, Riverside, USA Wangbo Liu, Southern University of Science and Technology and North China University of Water Resources and Electric Power, China								
12:30	12:30-13:15 Lunch Hall 1								
13:15	13:15-14:30 Poster Session 2 Hall 1 Presentation type: Poster								
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19:00	19:00-22:30 Conference Dinner (Ticketed Event) The Island Gold Coast, Surfers Paradise								

[별첨 2] EcoSummit Congress Program(일자별 세션 구성) - 계속

JUNE																									
GMT+10	17																								
08:30	08:30-09:00 Plenary Speaker 7: Brian Fath, Towson University, USA Arena 1B Presentation type: Oral																								
09:00	09:00-09:30 Plenary Speaker 8: Alan Hastings, University of California, Davis, USA Arena 1B Presentation type: Oral																								
09:30	<table border="1"> <tr> <td>09:30-11:00</td> <td>09:30-11:00</td> <td>09:30-11:00</td> <td>09:30-11:00</td> <td>09:30-11:00</td> <td>09:30-11:00</td> <td>09:30-10:15</td> <td>09:30-11:00</td> </tr> <tr> <td>Session 68: Biodiversity and biological conservation Arena 1B Presentation type: Oral</td> <td>Session 69: Ecological modelling Arena 1A Presentation type: Oral</td> <td>Session 70: Symposium - Invasions of bamboos and IT's consequences Meeting Room 5 Presentation type: Oral Mahe Li</td> <td>Session 71: Symposium - Facilitating biodiversity research and conservation at landscape scale using multi-techniques Meeting Room 6 Presentation type: Oral Xuehua Liu</td> <td>Session 72: Symposium - Floating treatment wetlands: Past, present, and future Meeting Room 7 Presentation type: Oral William Strodsider</td> <td>Session 73: Symposium - Indicators of human and ecological wellbeing Meeting Room 8 Presentation type: Oral Paul Sutton</td> <td>Session 74: Symposium - Valorizing Sargassum sp. in the global south: Turning the crisis into opportunities Meeting Room 9 Presentation type: Oral</td> <td>Session 76: Working Group - Combining health and biodiversity conservation - How to increase public awareness on conservation Meeting Room 4 Presentation type: Oral Yurong Yu</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>10:15-11:00 Session 75: Symposium - On ecological modelling of multidimensional attributes of embedded ecosystems Meeting Room 9 Presentation type: Oral Shashtri Nimmagadda</td> <td></td> </tr> </table>	09:30-11:00	09:30-11:00	09:30-11:00	09:30-11:00	09:30-11:00	09:30-11:00	09:30-10:15	09:30-11:00	Session 68: Biodiversity and biological conservation Arena 1B Presentation type: Oral	Session 69: Ecological modelling Arena 1A Presentation type: Oral	Session 70: Symposium - Invasions of bamboos and IT's consequences Meeting Room 5 Presentation type: Oral Mahe Li	Session 71: Symposium - Facilitating biodiversity research and conservation at landscape scale using multi-techniques Meeting Room 6 Presentation type: Oral Xuehua Liu	Session 72: Symposium - Floating treatment wetlands: Past, present, and future Meeting Room 7 Presentation type: Oral William Strodsider	Session 73: Symposium - Indicators of human and ecological wellbeing Meeting Room 8 Presentation type: Oral Paul Sutton	Session 74: Symposium - Valorizing Sargassum sp. in the global south: Turning the crisis into opportunities Meeting Room 9 Presentation type: Oral	Session 76: Working Group - Combining health and biodiversity conservation - How to increase public awareness on conservation Meeting Room 4 Presentation type: Oral Yurong Yu							10:15-11:00 Session 75: Symposium - On ecological modelling of multidimensional attributes of embedded ecosystems Meeting Room 9 Presentation type: Oral Shashtri Nimmagadda	
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13:00	13:00-13:45 Lunch Hall 1																								
13:45	13:45-15:00 Poster Session 2 (continued) Hall 1 Presentation type: Poster																								
15:00	15:00-15:30 Plenary Speaker 9: Sandrine Dixson-Declève, Club of Rome, Italy Arena 1B Presentation type: Oral																								
15:30	15:30-16:30 Closing Session Arena 1B Presentation type: Oral 15:30-16:00 Presentation of Distinguished Ecologists Awards 16:00-16:30 Closing remarks																								
16:30																									

[별첨 3] EcoSummit Congress 발표 초록 (남정호)

EcoSummit 2023

AMEND CONTINUE

Submission ID

260

Title (required)

Will South Korea have mangrove forests under accelerated climate change?

Abstract (required)

Temperate climate region has drawn less attention than tropical climate zone or polar regions in terms of impacts on marine ecosystem. More accelerated climate change can cause biodiversity redistribution of marine ecosystem. Considering biological re-alignment in marine and coastal areas is three times faster than in the terrestrial ecosystem, temperate climate region is likely to be biodiversity redistribution hotspots in terms of climate change adaptation. Scenario-based adaptation strategy needs to be prepared for responding the redistribution, and be incorporated into a national climate change policy for the countries in the temperate climate region.

In terms of the climate change-driven biodiversity redistribution, our research question is whether South Korean community will witness the introduction of mangroves, one of representative species of tropical/sub-tropical region. We conducted spatial analysis of the mangrove introduction possibility from 1981 to 2100, based on RCP 8.5 scenario. The climatic variables affecting the spread of mangrove are considered, such as annual mean minimum air temperature and annual mean sea surface temperature of the coldest month. Also, based on the above results, the rate of change of the marine ecosystem in Korea was quantified and compared with that of the global marine ecosystem.

Our research provides several implications for climate change adaptation policy of the Korean society: conversion of bare tidal mud flats to mangrove forests in coastal areas within 30 years, socio-economic change by mangrove introduction, blue carbon potential increase, and marine ecosystem services increase, e.g. less damage from coastal hazards etc. This research is also expected to contribute to formulation of legal and institutional mechanisms for marine and coastal climate change adaptation, and re-arrangement of climate-related marine policy and plans at national and local levels.

Category (required)

Coastal Systems: Coastal marine habitats

Keywords

climate change, mangrove, temperate region, ecosystem services

Previous submission (required)

Yes

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755

Author Approval (required)

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Seoul National University, Gwanak-gu, Republic of Korea

[별첨 4] EcoSummit Congress 발표 초록 (임종서)

EcoSummit 2023

AMEND

CONTINUE

Submission ID

257

Title (required)

Paradoxical ripple effect of geopolitics and natural hazards-driven land cover change on coastal wetlands in North Korea

Abstract (required)

The drastic land cover change such as reclamation have long been significant issues and its impacts might be one major negative pressure shrinking resilience of ecosystem services to natural environment in the Yellow Sea. This study, however, sheds new light on the increase of coastal wetlands extent in North Korea, which has evidenced under continued reclamations since 1980s. By use of the remote sensing analysis, we identified the spatiotemporal changes of deforestation, coastal loadings of suspended solids concentration (SSC), and the extent of coastal wetlands in North Korea, over the past 30 years (1981-2010). Interestingly, the deforestation was clearly observed with concurrent increase of both SSC and wetlands extent, and such trend prevailed especially during the period of "North Korea famine" from the mid-1990s to the late-2000s. We interpreted and discussed this paradoxical increase of coastal wetlands under the reclamation era in aspect of "socio-ecological" cascade effect. Inviting a political angle to the given phenomenon, this unusual case seemed to be triggered by the global political regime change of socialism collapse in the late-1980s. Accordingly, the consequential shortage of the goods, fuels, and foods in the following decades (viz., 1990s~2000s) might have accelerated such change, not only from terrestrial but also to coastal environments of North Korea. The present study addressed overall status of long-term land cover change being linked to the historical reclamations and deforestation in North Korea. And we also highlighted socio-ecological and political perspectives and impacts on the diagnosis by adopting multiple interpretative angles to natural phenomenon. In addition, the ecological trade-off is also stimulated a curiosity that the decrease in climate mitigation benefits due to the deforestation might have been somewhat offset by virtue of the increase in wetland extent, which would be investigated in the further study.

Category (required)

Ecology and Biodiversity: Ecological complexity

Keywords

tidal wetland, soil discharge, coastal loadings, land-ocean connectivity

Previous submission (required)

Yes

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Author Approval (required)

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