

ACTIVITIES ON IRZ & PRZ IN KOREAN CONTRACT AREA

Koreansture of Ocean Science & Technology

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Korea Contract Area





- 1994 : Registration as a pioneer investor (150,000 km²)
- 1997 : 1st relinquishment (30,000km²)
- 1999 : 2nd relinquishment (15,000km²)
- 2002 : Selection of final contract area (75,000km²)



- Stage I (1994-2010) : Resource assessment and environmental baseline study
 - 925 days (ave. 62 days/year)
- Stage II (2011-2015) : High resolution topographic and acoustic seafloor mapping in a prospective area and environment data collection for BIE (195 days)





Preservation Reference Zone



- Selection of a Long-term Monitoring Site in 1995
- Representative of the environmental characteristics of the southern Korea Contract Blocks
- KOMO (KODES Long-term Monitoring Station)
 - 10.5°N, 131.3°W
 - Chemical oceanographic observation since 1995
 - Operation of mooring system from 2003
- Can be served as the PRZ for 'Benthic Impact Experiment'
- Can be impacted by mining activities





- Conductivity-temperature-depth (CTD) system
- Temperature, Salinity, Dissolved oxygen, etc.







0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50





Depth-averaged Salinity







PRZ _ Physical Oceanography



- Long-term mooring system
- Current profiles at three different depths (1250m, 4550m, 5000m)







Progressive Vector Diagram



Donth	Observation	Mean Scalar Speed (cm/s)	Mean Vector Velocity (KOMO1)				
(m)	period		u(cm/s)	v(cm/s)	speed (cm/s)	Direction (degree)	
1,250	2008-2013	4.68	-0.65	0.22	0.39	288.6	
4,550	2003-2013	3.64	1.07	0.37	1.13	75.4	
5,000	2003-2013	3.63	1.27	0.32	1.31	75.37	



- Conductivity-temperature-depth (CTD) system
- Annual and depth variation of the major nutrients





DO (µmol/kg)

PRZ _ Particle flux



- Long-term Mooring System (Sediment trap)
- Annual variation of particle flux at three depth (1200m, 4500m, 4950m)





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PRZ _ Particle flux

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• Natural variation of total particle flux at three different depth

- Monthly variation
 - 2003-2007 vs. 2008-2014
 - 2008: PDO regime shift (warm to cold)





PRZ _ Biological community



- Bongo Net
- Abundance, biomass and species structure
 - Zooplankton









PRZ _ Biological community



- Multiple Corer
- Abundance, biomass and species structure
 - Meiofauna, Microfauna



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Sbjct	296	CTCCGGAATCAAACC	CTGAT7CTCOGTTACCOG	TTACAACCATGOTNOG	OGCATAAACTA	231
Query	61	CCATOGARAGTTGAT	ANGCAGACACTTGANAG	ATGOSTOSCOGGTACG	A-GACCATGOG	115
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Query	120	ATCGACTAAGTTATT	CAGATTCACCAGGTTACG	TRCOGANGTACGATTO	OTTTTGTTCTA	175
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Query	180	ATAAATGOGCTTCTT	CCGTARGETCGARGCTTT	GCTGCGTGTATTAGCT	CINGARITACC	239
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PRZ _ Biological community



- Box Corer, Deep-towed Camera System
- Abundance, biomass and species structure
 - Macrofauna, Megafauna









Impact Reference Zone



- Selection for 'Benthic Impact Experiment' Site in 2010 (not as an Impact Reference Zone)
- Similar conditions with PRZ in environmental characteristics
- Dimension (100km², 10x10km)
 - 10°27' ~ 10°33'N, 131°53' ~ 131°58'W
 - Distance between IRZ & PRZ: ~70km
- Baseline studies from 2011 to 2014 for comparison between IRZ & PRZ





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	Range	Average	Winter-Spring (Dec. – May)	Summer-Fall (June – Nov.)
КОМО	10.5 - 132.6	40.2	55.0	19.9
BIS	11.4 - 115.2	34.3	47.7	16.0

(mg m⁻² day⁻¹)



IRZ vs. PRZ _ Meiofauna







IRZ vs. PRZ _ Macrofauna







IRZ vs. PRZ _ Sediment Property





Future Exploration Plan of Korea



- Five year extension contract: 2016.4 2020. 4
- Objectives of activity programme (Two exploration cruises: 2018, 2019)
 - Estimation of polymetallic nodule abundance
 - Gathering additional environmental and biological data
- Exploration Plan for 2018 cruise (provisional)
 - RV Kilo Moana (Univ. of Hawaii)
 - Duration: 30days (20 May to 19 June)
 - Biological baseline data from IRZ, PRZ, and APEI
 - DCS data for mega-fauna distribution in KR5 area







Thank you !!!