

Hanna NA

Assistant Professor

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EDUCATION

- 2011.02 **Ph.D., Physical Oceanography**
School of Earth and Environmental Sciences, College of Natural Sciences, SNU
- 2006.02 **M.Sc., Physical Oceanography**
School of Earth and Environmental Sciences, College of Natural Sciences, SNU
- 2004.02 **B.Sc., Oceanography**
School of Earth and Environmental Sciences, College of Natural Sciences, SNU

PROFESSIONAL EXPERIENCE

- 2018.03– **Assistant Professor**
School of Earth and Environmental Sciences, College of Natural Sciences, SNU
- 2016.03– **Senior Research Scientist**
2018.02 Ocean Circulation and Climate Research Center
Korea Institute of Ocean Science and Technology (KIOST)
- 2013.01– **Assistant Professor** (specially-appointed during 2013.01–2015.03)
2016.02 Faculty of Science, Hokkaido University, Japan
- 2012.01–12 **Postdoctoral Fellow**
Graduate School of Oceanography, University of Rhode Island, USA
- 2011.03–12 **Postdoctoral Scientist**
Research Institute of Basic Sciences, SNU
- 2006.03– **Research/Teaching Assistant** (as a Ph.D. student)
2011.03 School of Earth and Environmental Sciences, College of Natural Sciences, SNU
- Guest Student** (2008.03–04)
Woods Hole Oceanographic Institution, USA
- Visiting Graduate Student** (2006.07–08)
Hokkaido University, Japan
- 2004.03– **Research/Teaching Assistant** (as a master's student)
2006.02 School of Earth and Environmental Sciences, College of Natural Sciences, SNU

RESEARCH INTERESTS

Western Boundary Current System, Atmosphere-Ocean Interaction (Air-Sea Interaction), Long-term Ocean Variability, Climate Variability, Ocean's role in Climate

PROFESSIONAL ACTIVITIES

Committee member at SNU

- Research Institute of Oceanography, SNU (2018.04-)
- Undergraduate interdisciplinary program and graduate program in Computational Science and Technology, SNU (2018.09-)

Member of the Scientific Steering Committee

- North Pacific Marine Science Organization (PICES) **Scientific Program 'FUTURE'** (2020-) <https://meetings.pices.int/members/Scientific-Programs/FUTURE-SSC#FUTURE-SSC-members>
- North Pacific Marine Science Organization (PICES) **study group on 'Early Career Ocean Professionals'** (2021) <https://meetings.pices.int/members/study-groups/SG-ECOP>
- ICES/PICES Conference for Early Career Scientists (2012.04)

Member of the Steering Committee

Korea Oceanographic Commission (KOC) PICES subcommittee (2021.05-)

Journal Editor

The Sea, Journal of the Korean Society of Oceanography (2020-) <https://www.jksocan.or.kr/>

Research Proposal Reviewer

Basic Research Grants from National Research Foundation of Korea

Student Poster Judge

The 5th Hokkaido University Sustainability Research Poster Contest (2013.11)

Workshop Co-Organizer

KIOST International Tropical Ocean Science Workshop 2017 (2017.03)

Session Co-Convener

- Annual Joint Symposium between Kyushu University and SNU (2021.06)
- Annual Joint Symposium between Hokkaido University and SNU (2019.11, 2018.11, 2015.11, 2014.11, 2013.12)

HONORS AND AWARDS

Ocean Science Journal Outstanding Reviewer Award

KSO Annual Meeting in Jeju, Korea (2021.11)

"Munmu of Silla" Early Career Scientist Award

문무대왕 해양대상 젊은과학자상(2020.07)

North Pacific Marine Science Organization (PICES) Best Presentation Awards

1. PICES 25th annual meeting in San Diego, CA, USA (2016.11)
Physical Oceanography and Climate (POC) Committee,
<http://meetings.pices.int/publications/presentations/PICES-2016#session11>
2. PICES 20th annual meeting in Khabarovsk, Russia (2011.10)
POC Committee, <https://meetings.pices.int/publications/presentations/PICES-2011#POC-1-P>
3. PICES 16th annual meeting in Victoria, BC, Canada (2007.11)
Technical Committee on Data Exchange (TCODE),
https://meetings.pices.int/publications/presentations/PICES_16#session810
4. PICES 14th annual meeting in Vladivostok, Russia (2005.10)
https://meetings.pices.int/publications/presentations/PICES_14#POC-1-P

Korean Society of Oceanography (KSO) Best Graduate Student Paper Award

KSO Annual Meeting in Busan, Korea (2011.06)

Travel Grants for Young Scientists

1. PICES 20th annual meeting in Khabarovsk, Russia (2011)
2. PICES 19th annual meeting in Portland, OR, USA (2010)

3. PICES 18th annual meeting in Jeju, Korea (2009)
4. PICES 16th annual meeting in Victoria, BC, Canada (2007)
5. IUGG 2007 in Perugia, Italy (2007)

TEACHING EXPERIENCE

Student Supervising at SNU

Graduate Students

1. Jiwon Kang (2018.03–2020.02, master's student): graduated
2. Chanmi Kim (2018.09–2020.08, master's student): graduated
3. Seungyong Lee (2019.09–, Ph.D. student; 2018.07–2019.08, research scientist at Research Institute of Oceanography, SNU)
4. Jihwan Kim (2019.03–, M.Sc.-Ph.D. student)
5. Eunsun Lee (2019.09–, Ph.D. student; 2019.04–08, research scientist at Research Institute of Oceanography, SNU)
6. Hyunwoo Lee (2021.09–, master's student; 2021.07–08, research scientist at Research Institute of Oceanography, SNU)
7. Hyung-Ju Park (2021.09–, M.Sc.-Ph.D. student; transferred from Statistical Climatology Lab, SNU)

Undergraduate Students

1. Hansol Shin (2018.12–2019.02): undergraduate student internship advisor
2. Sohun Kwag (2020): B.Sc. thesis advisor
3. Hunwoo Lee (2021): B.Sc. thesis advisor
4. Hyerin Kwon (2021.12–2022.02): undergraduate student internship advisor; visiting from Kyungpook National University

Lectures at SNU

- Physical Oceanography and Lab. (*Spring 2022, Spring 2021, Spring 2020, Spring 2019, Spring 2018*)
- Fundamentals of Fluid Dynamics (*Fall 2021, Fall 2020, Fall 2019, Fall 2018*)
- Theory and Practice in Computational Sciences 1 (*Spring 2022*)
- Earth and Environmental Sciences & Lab. (*Spring 2021, Spring 2020, Spring 2019*)
- Ocean Currents (*Fall 2020*)
- Seminar in Earth and Environmental Sciences (*Fall 2021*)

Outreaching at SNU

- Lecturer at SNU Public Lecture series 자연과학 공개강연(*February 2021*)
- Lecturer at SNU College of Natural Sciences Lecture Series for high school students 토요일과학공개강좌(*April 2021, November 2020, November 2019*)

Mentoring at KIOST

- Group leader of mentoring program for female early career scientists (2017)
- Instructor of summer camp at Korea South Pacific Ocean Research Center located in Chuuk, Federated States of Micronesia (2017.08, <http://dl.dongascience.com/magazine/view/S201710N036>)

Student Supervising at Hokkaido University

Ryosuke Kimura and Shinnosuke Yata (2015.04–2016.02; received master's degrees from Graduate School of Science, Hokkaido University)

FUNDED PROJECTS AS A PI

Basic Research Grants for Young Researcher Program from National Research Foundation of Korea

KRW 100,000K/year to SNU (2019.03–2023.02; 4 years)

“A study on upstream-downstream connectivity of the western boundary current in the North Pacific and its relationship with mesoscale eddy activity”

additional KRW 100,000K to SNU (2019) for being selected as a New Innovative Lab

한국연구재단 신진연구 최초혁신실험실

Research funding from KIOST (2019.02–12)

“Understanding the Kuroshio Extension variability based on the analysis of multiple reanalysis and satellite datasets”

New faculty start-up grants from SNU (SNU internal funding, 2018.04–2019.03)

“Understanding the relationship between Kuroshio and atmospheric boundary layer in the western North Pacific”

Start-up research grants from KIOST (KIOST internal funding, 2016.04–12)

“Oceanic- and atmospheric-driven bottom pressure variability in the Kuroshio Extension”

Start-up research grants from F3 Project of Hokkaido University (2013.01–2015.03)

OTHER EXPERIENCE IN FUNDED PROJECT (SELECTED)

East Asian Seas Time Series (2019.05–)

Ministry of Land, Transport and Maritime Affairs, Korea

PI: Prof. Guebuem Kim (SNU)

Seychelles-Chaos Thermocline Ridge in the tropical Indian Ocean (2019, 2020–2022)

Ministry of Land, Transport and Maritime Affairs, Korea

PI: Prof. SungHyun Nam (SNU)

A study on the variation of material cycles in the Kuroshio Extension (2017)

KIOST internal funding

PI: Dr. Young-Gyu Park (KIOST)

Ocean temperature and current changes in the East China Sea-effects of Kuroshio variability on ocean environmental changes (2016–2017)

KIOST internal funding

PI: Dr. Hong-Sik Min (KIOST)

Kuroshio-Ryukyu Current System Study (2015)

Japan Society for the Promotion of Science, Japan

PI: Prof. Hirohiko Nakamura (Kagoshima University)

Measuring the flow through the Kerama Gap (2012–2014)

Office of Naval Research, USA

PI: Prof. Mark Wimbush and Dr. Jae-Hun Park (University of Rhode Island)

Oceanic Response to Atmospheric Forcing in the Kuroshio Extension (2012)

National Science Foundation, USA

PI: Prof. D. Randolph Watts (University of Rhode Island)

FIELD EXPERIENCE

Kuroshio in the East China Sea

T/V Kagoshima-maru (2021.06, 2020.06; participated remotely due to COVID-19)

Joint cruise with Kagoshima University (Japan) and KIOST (Korea)

Kuroshio Extension

R/V Isabu (2018.08)

Kuroshio-Ryukyu Current System Study

T/V Kagoshima-maru (2018.06, 2017.06, 2016.06, 2015.06)

Joint cruise between Kagoshima University (Japan), Second Institute of Oceanography (China), and KIOST (Korea)

High Frequency Radar (Field Trip and Data Management)

Application to the east coast off Korea (2006.05–2008.08)

East/Japan Sea (CTD)

- R/V Lavrentyev (2009.07, 2005.10)
Joint cruise with Pacific Oceanological Institute (Russia)
- R/V Haeyang 2000 (2008.08, 2005.05)
Joint cruise with National Fisheries Research and Development Institute (Korea)
- R/V Tamyang (2007.06, 2006.05, 2003.06)

Korea/Tsushima Strait Joint Cruise (CTD, ADCP, DO sampling)

R/V Tamyang (2007.05, 2006.11, 2006.10)

MANUSCRIPT SUBMITTED (# DENOTES STUDENT ADVISEE)

Eunsun Lee#, Chanmi Kim#, and **Hanna Na***, Suppressed upwelling events in the Seychelles-Chagos Thermocline Ridge of the southwestern tropical Indian Ocean, in review

REFEREED PUBLICATIONS (# DENOTES STUDENT ADVISEE)

1. Jihwan Kim# and **Hanna Na*** (2022), Interannual Variability of Yellowfin Tuna (*Thunnus albacares*) and Bigeye Tuna (*Thunnus obesus*) Catches in the Southwestern Tropical Indian Ocean and Its Relationship to Climate Variability, *Frontiers in Marine Science*, **9**, 857405.
2. Jiwon Kang# and **Hanna Na*** (2022), Long-term variability of the Kuroshio shelf intrusion and its relationship to upper-ocean current and temperature variability in the East China Sea, *Frontiers in Marine Science*, **9**, 812911.
3. Hua Zheng, Xiao-Hua Zhu*, Hirohiko Nakamura, Jae-Hun Park, Chanhyung Jeon, Ruixiang Zhao, Ayako Nishina, Chuanzheng Zhang, **Hanna Na**, Ze-Nan Zhu, Hong Sik Min (2020), Generation and Propagation of 21-day Bottom Pressure Variability driven by Wind Stress Curl in the East China Sea, *Acta Oceanologica Sinica*, **39**, 91–106.
4. Ruixiang Zhao, Hirohiko Nakamura, Xiao-Hua Zhu*, Jae-Hun Park, Ayako Nishina, Chuanzheng Zhang, **Hanna Na**, Chanhyung Jeon, Ze-Nan Zhu, Hong Sik Min (2020), Tempo-spatial variations of the Ryukyu Current southeast of Miyakojima Island determined from mooring observations, *Scientific Reports*, **10**, 6656.
5. Jihwan Kim#, **Hanna Na***, Young-Gyu Park, Young Ho Kim (2020), Potential Predictability of Skipjack Tuna (*Katsuwonus pelamis*) Catches in the Western Central Pacific, *Scientific Reports*, **10**, 3193.
6. Chanhyung Jeon, Jae-Hun Park*, Hirohiko Nakamura, Ayako Nishina, Xiao-Hua Zhu, Dong Guk Kim, Hong Sik Min, Sok Kuh Kang, **Hanna Na**, Naoki Hirose (2019), Poleward-propagating near-inertial waves enabled by the western boundary current, *Scientific Reports*, **9**, 9955.
7. Kwang-Yul Kim*, Ji-Young Kim, Jinju Kim, Saerim Yeo, **Hanna Na**, Benjamin D. Hamlington, and Robert R. Leben (2019), Vertical feedback mechanism of winter Arctic amplification and sea ice loss, *Scientific Reports*, **9**, 1184, doi.org/10.1038/s41598-018-38109-x.
8. **Hanna Na***, Kwang-Yul Kim, Shoshiro Minobe, and Yoshi N. Sasaki (2018), Interannual to decadal variability of the upper-ocean heat content in the western North Pacific and its

- relationship to oceanic and atmospheric variability, *Journal of Climate*, <https://doi.org/10.1175/JCLI-D-17-0506.1>.
9. Kwang-Yul Kim*, Benjamin D. Hamlington, **Hanna Na**, and Jinju Kim (2016), Mechanism of seasonal Arctic sea ice evolution and Arctic amplification, *The Cryosphere*, **10**, 21912202, doi:10.5194/tc-10-2191-2016.
 10. **Hanna Na**, D. Randolph Watts, Jae-Hun Park*, Chanhyung Jeon, Ho Jin Lee, Masami NONAKA, and Andrew D. GREENE (2016), Bottom pressure variability in the Kuroshio Extension driven by the atmosphere and ocean instabilities, *Journal of Geophysical Research-Oceans*, **121**, 6507–6519, doi:10.1002/2016JC012097.
 11. Seungtae Yoon, Kyung-Il Chang*, **Hanna Na**, and Shoshiro Minobe (2016), An east-west contrast of upper ocean heat content variation south of the subpolar front in the East/Japan Sea, *Journal of Geophysical Research-Oceans*, **121**, 6418–6443, doi:10.1002/2016JC011891.
 12. Zhitao Yu*, E. Joseph Metzger, Prasad Thoppil, Harley E. Hurlburt, Luis Zamudio, Ole Martin Smedstad, **Hanna Na**, Hirohiko Nakamura, and Jae-Hun Park (2015), Seasonal cycle of volume transport through Kerama Gap revealed by a 20-year global HYbrid Coordinate Ocean Model reanalysis, *Ocean Modeling*, **96**, 203–213.
 13. Kwang-Yul Kim*, Benjamin Hamlington, and **Hanna Na** (2015), Theoretical Foundation of Cyclostationary EOF Analysis for Geophysical and Climate Variables: Concepts and Examples, *Earth–Science Reviews*, **150**, 201–218.
 14. Taewook Park, Chan Joo Jang*, Minho Kwon, **Hanna Na**, and Kwang-Yul Kim (2015), An effect of ENSO on summer surface salinity in the Yellow and East China Seas, *Journal of Marine Systems*, **141**, 122–127, doi:10.1016/j.jmarsys.2014.03.017.
 15. **Hanna Na**, Mark Wimbush, Jae-Hun Park*, Hirohiko Nakamura, and Ayako Nishina (2014), Observations of flow variability through the Kerama Gap between the East China Sea and the northwestern Pacific, *Journal of Geophysical Research-Oceans*, **119**, 689–703, doi:10.1002/2013JC008899.
 16. Kwang-Yul Kim*, **Hanna Na**, and Hun-Gyu Lee (2013), Energy budget change in the tropics according to the SRES A1B scenario in the IPCC AR4 models, *Journal of Geophysical Research-Atmospheres*, **118**, 2521–2534, doi:10.1002/jgrd.50240.
 17. Sukgeun Jung, Seungmok Ha, and **Hanna Na*** (2013), Multi-decadal Changes in Fish Communities Jeju Island in Relation to Climate Change, *Korean Journal of Fisheries and Aquatic Sciences*, **46**(2), 186–194, 2013 (in Korean with English abstract)
 18. **Hanna Na**, Jae-Hun Park*, D. Randolph Watts, Kathleen A. Donohue, and Ho Jin Lee (2012), Near 13 day barotropic ocean response to the atmospheric forcing in the North Pacific, *Journal of Geophysical Research-Oceans*, **117**, C12019, doi:10.1029/2012JC008211.
 19. Kwang-Yul Kim*, **Hanna Na**, and Jong-Gap Jhun (2012), Oceanic response to midlatitude Rossby waves aloft and its feedback in the lower atmosphere in winter Northern Hemisphere, *Journal of Geophysical Research-Atmospheres*, **117**, D07110, doi:10.1029/2011JD017238.

20. **Hanna Na**, Kwang-Yul Kim*, Kyung-Il Chang, Jong Jin Park, Kuh Kim, and Shoshiro Minobe (2012), Decadal variability of the upper-ocean heat content in the East/Japan Sea and its relationship to Northwestern Pacific variability, *Journal of Geophysical Research–Oceans*, **117**, C02017, doi:10.1029/2011JC007369.
21. **Hanna Na**, Bong-Geun Jang, Won-Moon Choi, and Kwang-Yul Kim* (2011), Statistical Simulations of the Future 50-Year Statistics of Cold-Tongue El Niño and Warm-Pool El Niño, *Asia-Pacific Journal of Atmospheric Sciences*, **47**(3), 223-233, DOI:10.1007/s13143-011-0011-1.
22. **Hanna Na**, Kwang-Yul Kim*, Kyung-Il Chang, Kuh Kim, Jae-Yul Yun, and Shoshiro Minobe (2010), Interannual variability of the Korea Strait Bottom Cold Water and its relationship with the upper water temperatures and atmospheric forcing in the Sea of Japan (East Sea), *Journal of Geophysical Research–Oceans*, **115**, C09031, doi:10.1029/2010JC006347.
23. Kwang-Yul Kim*, Rokjin J. Park, Kyung-Ryul Kim, and **Hanna Na** (2010), Weekend effect: Anthropogenic or natural?, *Geophysical Research Letters*, **37**, L09808, doi:10.1029/2010GL043233.
24. **Hanna Na***, Yutaka Isoda, Kuk Kim, Young Ho Kim, and Sang Jin Lyu (2009), Recent observations in the straits of the East/Japan Sea: a review of hydrography, currents and volume transports, *Journal of Marine Systems*, **78**(2), Observation and Modeling of the Ocean Circulation and Marine Ecosystem for CREAMS/PICES, 200–205.

OTHER PUBLICATIONS

Book Chapters

Kyung-Ae Park, Kyung-Il Chang, **Hanna Na**, and Uk-Jae Jung (2015), Chapter 2. Forcings, in “Oceanography of the East Sea (Japan Sea)”, Springer.

Cruise/Technical Reports

- Zhaojun Liu, **Hanna Na**, Hirohiko Nakamura, Ayako Nishina, Jae-Hun Park, Karen Tracey, and Mark Wimbush (2012), Kerama Gap 2009-2011 data report, GSO Tech. Rep. 2012-02, 34pp., Graduate School of Oceanography, University of Rhode Island, Narragansett, R. I.
- **Hanna Na** (2007), Cruise Report: Korea/Tsushima Strait Joint Survey.
- **Hanna Na** (2007), Technical Report: Application of High-Frequency Radar to the east coast of Korea. (in Korean)

Domestic Journal

Kuh Kim, **Hanna Na**, SungHyun Nam, Jong Jin Park, Yun-Bae Kim, and Kyung-Ae Park (2004), Current and ocean circulation, *Physics and High Technology*, **13** (11). (in Korean)

Thesis

- Hanna Na (2011), Seasonal to decadal variability of the upper-ocean hydrography and circulation in the East Sea, Ph.D. Thesis, Seoul National University. (Advisors: Kwang-Yul Kim and Kuh Kim)
- Hanna Na (2006), Temporal Variability of the Volume Transport through the Korea Strait and the Tsugaru Strait, M.Sc. Thesis, Seoul National University. (Advisor: Kuh Kim)
- Hanna Na (2004), Laboratory Experiments on western boundary current separation, B.Sc. Thesis, Seoul National University. (Advisor: Kuh Kim)