



Asia Regional Engagement Meeting and Symposium on Open Science and Data Use

Data Use for International Platforms for Policies

Yongyut Trisurat

Professor, Kasetsart University Co-chair, Asia-Pacific Observation Network (APBON)

> 22-24 November 2022 Chulalongkorn University, Bangkok



What is APBON?

supported by the Ministry of the Environment Japan

APBON (est. in 2009) is a network for observations and assessment of biodiversity, and a platform for science-policy engagement.

Mission: to increase exchange of knowledge and know-how between institutions and researchers concerning biodiversity science research in the Asia-Pacific (AP) region and thereby contribute to evidence-based decision-making and policy-making.



Hiroyuki Muraoka Gifu University, National Institute for Environmental Studies



Runi Sylvester Pungga International Affairs Division, Forest Depa



Assessments

IPBES regional assessment

National Biodiversity

Outlooks

Yongyut Trisurat Kasetsart University,

Networking and facilitating

http://www.esabii.biodic.go.jp Asia Pacific Biodiversity

APBON



KU APBON highlights

Monitoring biodiversity

- Mapping tropical tree species and forest cover change
- Sudden red tine in Hokkaido (2021)
- Mapping protected areas in the Hindu Kush Himalaya
- Evaluating impacts of hydropower dams and climate change on fish species diversity in the Mekong
- Investigating African swine fever infection in wild boars in Malaysia (2022)

"APBON Books" Ed. Yahara. (Springer, 2012, 2014, 2016)



Conservation

- OECMs/KBAs
- Improved community fishery governance in Cambodia
- Mapping "Ecologically and Biologically Significant Areas" in the oceans

Mobilizing biodiversity data





APBON development and networking

KU

Year	GEO/GEOSS Symposia	GEO BON	AP BON Meetings	National BONs	CBD COPs	IPBES
2009	3rd GEOSS AP (Kyoto, February)		1st AP BON (July, Japan) 2nd AP BON (December, Japan)	Japan BON (May)		
2010	4th GEOSS AP (a session, Bali, March)	GEO BON Meeting (February, USA)	3rd AP BON (CBD COP10 Preconference, March, Japan)		COP10 (Japan, Side- event)	
2011			4th AP BON (December, Japan)			
2012	5th GEOSS AP (Tokyo, April)	GEO BON Meeting (December, USA)	WCC of IUCN (September, Korea)	Korea BON, Nepal BON, Banglades n BON	OP(India, Side- event)	
2013	6th GEOSS AP (Ahmedabad, February)		5th AP BON (November, ACB, Philippines)	Philippines on		Plenary-1
2014	7th GEOSS AP (Tokyo, May)	IC and AB (June, Germany)	6th AP BON (October, NILR 107 a)		COP12 (Korea, Side- event)	Plenary-2
2015	8th GEOSS AP (Beijing, September)	IC and AB (June, Germany)	n in .	Sino BON Indonesia BON		Plenary-3
2016	2016-2025 A New GEO Strategy Plan Initiated	All-Hands Meeting (Ju v) Germany	71 AF BON (ACB, Thailand) 8th AP BON (Taipei, Taiwan)	WCC of IUCN (September, USA)	COP13 (Mexico)	Plenary-4
2017	9th GEOSS AP (Tokyo, January), 10th GEOSS AP (Hanoi, September)	(i) and A. (July, Germany)				Plenary-5
2018	11th GEOSS AP (October, Kyoto)	All-Hands Meeting (July, Beijing)	9th AP BON (Bangkok, February), 10th AP BON (Kuching, July)		COP14 (Egypt)	Plenary-6
2019	12th AOGEO (November, Canberra)		11 th AP BON (KL, Malaysia)			Plenary-7
2020		Open Science Conference & All Hands Meeting			COP15 (China) (postponed)	Plenary-8 (tbc)
2021	13 th AOGEO (March, Online) 4 th AOGEO WS (July) 14 th AOGEO (Nov. Online)		12 th APBON (Online) <mark>13th APBON (Online)</mark>		COP15 (China)	Plenary-8 (June)



Participants from...

Japan, Thailand, Malaysia, China, Republic of Korea, Indonesia, Nepal, Cambodia, Myanmar, Vietnam, Philippines, USA, ASEAN Centre for Biodiversity, ICIMOD

APBON Work Plan to 2030 and Plan for 2023-2025



Strengthening observations and proceeding data sharing	Stakeholder engagement and capacity development						
 Continuing observations of biodiversity and ecosystems for assessing status and changes under environmental changes Phenology and carbon cycle as the interface of biodiversity and climate change issues eDNA and high throughput DNA sequencing for species identification and monitoring Scaling-up of biodiversity observation is key High resolution satellite data are key for biodiversity indicators and metrics Verification and implementation of Essential Biodiversity Variables are key for continuous observations Master site concept to enable multi- disciplinary and multi-platform observations. 	 Governments, private sectors, citizens, youth networks from the region and beyond APBON is expected Development of networks within countries (→ National BONs), regional and global. Encouragement and support the education / training / meeting / workshop opportunity Translating and digitizing data/knowledge in local language to English for rescuing historical local data, and comprehensive, fair assessment and conservation of biodiversity and Nature's contribution to people (e.g., resources, cultures, etc.) in the Asia-Oceania region 						
Contribution to national, regional and global efforts							
 Sustainable Development Goals (SDGs6, 12, 13, 14, 15 CBD Post-2020 Global Biodiversity Framework Taskforce on Nature-related Financial Disclosures (TNFD) 							

KU

٠

	🤊 Oe
Received: 19 April 2020 Revised: 21 January 2021 Accepted: 25	January 2021
DOI: 10.1111/1440-1705.3212	
	FCOLOGICAL WILEY
BIODIVERSITY IN ASIA	
The Asia Pacific Biodiman	ity Observation Network: 10 year
The Asia-Pacific Biodivers	sity Observation Network: 10-year
achievements and new str	rategies to 2030
	-
Vavoi Takeuchi ¹ Hirovuki Mura	oka ² Takehisa Yamakita ³
Vuichi Kano ⁴ Shin Nagal ⁵	auch Bunthang ⁶ Mark John Costello ^{7,8}
Puter Rano Shin Nagar 10	Teners Compilling Andrew Content Content P
Dedy Darnaedi" Bibian Diway"	Tonny Ganyai" Chaiwut Grudpan"
Alice Hughes" Reiichiro Ishii"	Po Teen Lim" Keping Ma"
Aidy M. Muslim ¹⁷ Shin-ichi Nak	ano ¹⁰ Masahiro Nakaoka ¹⁹
Tohru Nakashizuka ^{14,30} Manabu O	numa ¹ Chan-Ho Park ²¹
Runi Sylvester Pungga ¹⁰ Yusuke Sa	aito ²² Mangal Man Shakya ²³
Mohd Khairulazman Sulaiman ²⁴ M	daya Sumi ¹ Phanara Thach ⁶
Yongvut Trisurat ²⁵ Xuehong Xu ²	• Hirova Yamano ¹
Tre Leong Vao ²⁷ Fun-Shik Kim ²⁸	Sheila Vergara ²⁹ Tetsukazu Vahara ³⁰
The being the province term	i shena tergata i retsukatu ranata
¹ Center for Environmental Biology and Ecosystem Studies, Nation	al Institute for Environmental Studies, 36-2 Onogawa, Tsakubu, Buzuki, 303-8506, Japan
the second	
"River Basin Research Center, Gifu University, 1-1 Yanagido, Gi	fa, 500-1193, Japan
*River Basin Research Center, Gilu University, 1-1 Yanagido, Gi *Marine Biodivenity and Environmental Assessment Research O Marine Finds Genera and Technology (IAMERIC), MA Marine	fa, 501-1193, Japan Center (Titolize), Research Institute for Global Change (RIGC), Japan Agency for Manucha Networks, Nanorese, 2020/01, Japan
"River Basin Research Center, Gilu University, 1-1 Yanagdo, Gi "Marine Biodivenity and Environmental Assessment Research O Marine-Earth Science and Technology (JAMSTEC), 2-15, Nature "Switzets and Decision Sciences for a Restandbe Weiset, Technol	fa, 565-1193, Japan Tenter (Biollinv), Romarch Institute for Global Change (EIGC), Japan Agency for Jahna cho, Yokouska, Kanagawa, 217-0061, Japan Duberskiv TAM Morinka Nichlich, Erdondus R304090, Japan
"River Basis Research Center, Cills University, 1-1 Yanagido, Gi 'Marine Biodivenity and Environmental Associated Research O Marine-Earth Science and Technology (JAMSTEC), 2-15, Natuu 'Institute of Decision Science for a Seatainable Society, Kyushu' 'Department of Environmental Geochemical Cycle Research, &	fa, 560-1193, Japan Emter (BioEnv), Rossarch Institute for Global Change (BIGC), Japan Agency for Jahara-che, Yokowska, Kanagana, 2370061, Japan University, 744 Motooka Nibhi-ku, Pukuoka, 819-0096, Japan pan Agency for Marine Farth Science and Technology, Yachanan, Kanagawa,
Wrett Basis Besearch Certer, Cibi University, 1-1 Tanagilo, Gi Marine Biodressity and Environmental Assessment Benearch to Marine-Earth Science and Technology (IAMSTEC), 2-15, Nature Tansitute of Decision Science for a Seatalandbe Society, Kyuhhu "Department of Environmental Geochemical Cycle Research, Ja 204-0001, Japan	fa, 561-1193, Japan Center, IBORTV, Benearch Institute for Global Change (RIGC), Japan Agency for Inhan-dhe, Yakovaka, Kanagena, 2374064, Japan Umbersity, 744 Metocka, Nishi-ka, Fukuoka, NIF4095, Japan Jan Agency for Marine-Earth Science and Technology, Yokshaesa, Kanagewa,
Wrete Basis Research Center, Cibi University, 1-1 Tanagilo, Gi Marine Biodressity and Environmental Assessment Research (Marine-Earth Science and Technology (IAMSTEC), 2-15, Nature Testificate of Decision Science for a Seatafanble Society, Kyuhai "Department of Environmental Geochemical Cycle Research, Ja 204-0001, Japan "Baland Fricheries Research and Development Institute of Fricheries "Baland Fricheries Research and Development Institute of Fricheries"	fa, 561-1193, Japan Emtre (Bollow), Benearch Institute for Global Change (BIGC), Japan Agency for Jahara che, Volocaka, Kanagena, 237-0061, Japan University, 744 Motoeka Nishi-ku, Pukuoka, 819-0095, Japan pan Agency for Marine-Barth Science and Technology, Yokohana, Kanagewa, an Administration, #186, Norodom Blod, Planen Penh, Cambodia
"Breet Basis Besearch Center, Cibi University, 1-1 Transglio, Ci Marsise Biodivenity and Environmental Assessment Research O Marsine-Earch Science and Technology (UAMSTEC), 2-15, Natrue "antitute of Decision Science for a Sentainable Society, Kyushu Department of Environmental Geochemical Cycle Bosearch, Ja 256-0001, Japan "Inland Fisheries Research and Development Institute of Fisher "Jaculty of Bioscience and Agaacchure, Nord University, Bode	fa. 561-1193, Japan Centrer, Biolitzvy, Benearch Institute for Global Change (BIGC), Japan Agency for Inhere-the, Volocaka, Kanagawa, 237-0061, Japan Umbrenity, 744 Motooka Nishi-ku, Pukuoka, 813-6095, Japan pan Agency for Marine-Earth Science and Technology, Yokohama, Kanagawa, ies Administration, #166, Norodom Illud., Pinnem Penh, Cambodia Norway.
Wreer Bakis Besearch Cortez, Cillo University, 1-1 Transgilo, GJ Marian Biodiversity and Environmental Assessmers Research & Mariane Earth Science and Technology (IAMSTEC), 2-15, Nairas "Institute of Deckino Science for a Statianable Society, Kyushu "Department of Environmental Geochemical Cycle Research, Ja 20-6000, Japan "Baland Fiberiens Research and Deviopment Invitine of Foloret "Faculty of Bioscience and Aquaculture, Nord Universitot, Bolde School of Environment, Diversity of Acatland, Auckland, J. 104 "Inhumition Messional Jakarts Galant, Bolders, Diversity Technology Comparison of Environment, Diversity of Acatland, Auckland, Japan	fa, 561-1193, Japan Center (Bollarv), Benearch Institute for Ciobial Change (BIGC), Japan Agency for Minne che, Vidooska, Kanagene, 237-0061, Japan University, 744 Motooka Nishi-ku, Fukzoka, 818-6099, Japan pan Agency for Marine-Earth Science and Technology, Yokohasna, Kanagewa, en Administration, #166, Norodom Blod., Plnom Penh, Cambodia Norway 2, New Zealand
Wrete Basis Besearch Center, Cibi University, 1-1 Transglio, G. Marine Biodiversity and Environmental Assessmeric Research Marine-Earth Science and Technology (JAMSTEC), 2-15, Nature Tauthard et Duckion Science for a Sustainable Society, Kywaha Yaopurtenee of Euroisonasental Geochemical Cycle Rosearch, Ja 236-0001, Japan "Bailand Fisheries Research and Development Institute of Fisher" Facely of Bioscience and Agasculture, Nord University, Biodec, 114 "University of Auckland, Auckland, 114 "University Nature Size Science", Development Development and Lancesian Linker, 2017 (Education, 1997).	fa, 560-1193, Japan Center (Bollarv), Benearch Institute for Ciobial Change (BIGC), Japan Agency for Jahner-the, Yokosuka, Kanagewa, 237-0061, Japan Diohernity, 744 Monoeka Nibih-ku, Fukuoka, 818-0095, Japan pan Agency for Marine-Earth Science and Technology, Yokohama, Kanagewa, en Administration, #166, Norodom Blvd., Pitnom Penh, Cambodia , Norway 2, New Zealand 1 trenet Sazawak, Kuching, Sarawak, Malaysia
"Breef Basis Besearch Corter, Cibi University, 1-1 Tanagilo, Gi Marine Biodweiry and Environmental Assessmere Besearch O Marine-Earth Science and Technology (IAMSTEC), 2-15, Natsus Tustitute of Decision Science for a Sustainable Society, Kywaho Popurtenet of Direisonasental Geochemical Cycle Research, Ja 236-0001, Japan "Baland Pibetrion Research and Development Institute of Fuber "Jacoby of Bioscience and Aquacchure, Nord Universited, Bold "School of Environment, University of Auckland, Auckland, 114 "Universitian National, Jakarth Scitatas, Bakrata, 1250, Indineses "Research and Development and Innovation Division, Forest Depu "Research and Development Department, Sarowaki Bereg Defi	fa, 561-1193, Japan fan 561-1193, Japan Conter, Bollow, Bosearch Institute for Global Change (RIGC), Japan Agency for hinar-dix, Yakoska, Kanagena, 237-0061, Japan Dinbersity, 744 Metooka Nishi-ka, Fukuoka, N3+0395, Japan pan Agency for Marine-Barth Science and Technology, Yokshasna, Kanagewa, an Administration, #116, Norodom Blvd, Planom Penh, Cambodia , Norwerg J. New Zealand temeré Sanzowic, Kuching, Sarzewak, Malaysia and, Kuching, Sarzewak, Malaysia
"Breet Basis Besearch Center, Cibi University, 1-1 Tanagilo, Gi Marine Biodweiry and Enricoremental Assessmeric Benearch (Marine-Earth Science and Technology (IAMSTEC), 2-15, Natsus "Institute of Decision Science for a Sentiatinhe Society, Kyuhab 2020001, Japan "Initial Fibietries Research and Development Institute of Fibietries Research and Agaacalture, Nord University of Boot "School of Enriconneem, University of Acachand, Acachand, 14 "Universitut Nasional, Jakarta Sciatan, Rokarta, 1250, Indonesis "Basearch, Development and Innovation Division, Forent Depu "Research, and Development Department, Sanwak Energy Beft "Oppartment of Fibietries, University of Acachada, Sensark Borg, Santon "Research and Development Department, Sanwak Energy Beft "Oppartment of Fibietries, University of Acachada, Science J Fibietries, Sathon"	fa, 561-1193, Japan Emer, Biolizivi, Basearch Institute for Global Change (BIGC), Japan Agency for Jahar chc, Vokoska, Kanaguwa, 237-0061, Japan University, 744 Motoeka Nibbi-ku, Pukuoka, 813-6096, Japan pan Agency for Marine-Barth Science and Technology, Yokuhama, Kanaguwa, en Administration, #186, Norodom IBod, Planen: Penh, Cambodia Norway 2, New Zealand 1 1 trenet Scanwak, Kuching, Sarawak, Malaysia tad, Kuching, Sarawak, Malaysia tada Kuching, Sarawak, Malaysia
Wret Basis Besearch Center, Cibi University, 1-1 Tanagilo, Gi Marine Biolowski yau di Eurócenenetral Ausoaneet Benearch (Marine-Earth Science and Technology (IAMSTEC), 2-15, Natur Tansitute of Decision Science for a Sentatinuble Society, Kyuhu) "Department of Environmental Geochemical Cycle Research, Ja 204-0001, Japan "Baland Fibierise Research and Development Institute of Fibieri "School of Environment, University of Auckland, Auckland, 14 "Universitan Nasional, Jakarta Sciatan, Jakarta, 1250, Indonesia "Benearch, Development and Innovation Division, Forent Depar- "Research, and Development Department, Sanwak Eoney Jen "Research and Development Department, Sanwak Eoney Jen "Department of Theines, Union Rachathani University, 5 Sathent "Center for Integrative Conservation, Xishuanghanna Tropical"	fa, 561-1193, Japan Emer, Biolinyi, Basaarch Institute for Global Change (BIGC), Japan Agency for Jinher, Hu, Yokonka, Kanaguwa, 237-0061, Japan Umbrenity, 744 Motooka Nihbi-ku, Pukuoka, 819-6095, Japan pan Agency for Marine-Earth Science and Technology, Yokohana, Kanaguwa, in Administration, #186, Norodom Bitsd, Pinnem Penh, Cambodia Norway 2, New Zuskand travert Saxowski, Kuching, Sarzwask, Malaysia tadi, Kaching, Sarawak, Sarzwask, Malaysia tadi, Kaching, Sarawak, Sarzwask, Malaysia tadi, Kaching, Sarawak, Sarzwask, Malaysia tadi, Kaching, Sarawak, Chameng Diterict, Uhon Rachathani, 54140, Thaland Bozakical Garden, Chinese Academy of Sciences, Menglun, Jinghong, 466300, China
¹⁸ Breet Basis Besearch Cortez, Gibi University, 1-1 Transglio, GJ Marine Biodrevity and Environmental Assessmers Research & Marine-Earth Science and Technology (DAMSTEC), 2-15, Natura Tandhate of Deckion Science for a Statianable Society, Ryunku Theoperatence of Environmental Geochemical Cycle Research, Ja 236-6001, Japan *Statud Fisheries Research and Development Institute of Fisher *Statud Fisheries Research and Development Institute of Fisher *Statud Fisheries Research and Development Institute of Fisher *School of Environment, University of Aackland, Auckland, 114 *Universita Nasional, Jahara Selatan, Islanta, Lisa *Daivensita Nasional, Jahara Selatan, Islanta, Lisa *Daivense of Environment and Innovation Division, Forent Depa *Research and Development Department, Sanwak Energy Beft *Department of Fisheries, Ubon Rachathaul University, IS Sathon *Caetuse for Inspirative Conservation, Xisharaghama Tropical *Research Institute for Humanity and Nature, 457-4 Mologama	fa, 561-1193, Japan Centre (Bollary), Benearch Institute for Global Change (BIGC), Japan Agency for Maine che, Volocoka, Kanagawa, 237-0061, Japan Umbrenity, 744 Motooka Nishi-ku, Fukuoka, 813-6095, Japan pan Agency for Marine-Earth Science and Technology, Yokohama, Kanagawa, ies Administration, #166, Norodom Bitel, Pinnem Penh, Cambodia Norway 2, New Zualand 1 tmenef Sanswik, Kuching, Sarawak, Malaysia and, Kuching, Senswik, Malaysia anak Bd, Masang Si Khai, Warin Chammp District, Ubon Rathathani, 34190, Thaliand bonaical Guidene, Chinese Academy of Sciences, Menghon, Jinghong, 666300, China & Kamigamo, Kita-ku, Kyoto, 603-8047, Japan
¹⁸ Breet Basies Besearch Center, Cibi University, 1-1 Transgilo, G. Marine Biodrevity and Environmental Assessmers Research Marine-Earth Science and Technology (JAMSTEC), 2-15, Nature Tauffact of Decision Science for a Sustainable Society, Kywaha Topograment of Environmental Geochemical Cycle Bosearch, 3g 236-0001, Japan ² Stalad Pfuvioannental Geochemical Cycle Bosearch, 3g 236-0001, Japan ² Stalad Pfuvioannental Geochemical Cycle Bosearch, 3g 236-0001, Japan ² Stalad Pfuvioannent, University of Auckland, Acakland, 114 ³ Universitian Nasional, Jaharts Scilatan, Jakaria, Jackson, Japan ³⁸ Basearch, and Development Dapartment, Sanwak Bioreg Fell ³⁰ Degarment of Fibietris, Uson Rachathani University, 15 Staliet ³⁰ Centre for Integrative Conservation, Xiohranghana Tropical ³⁰ Research and Interior Station, Jastaria, 47-4 Motopana ³⁸ Bachaik Marcine Research Station, Institute of Ocean and Earth ³⁰ Research Martine Research Station, Institute of Ocean and Earth ³⁰ Research Martine Research Station, Jastara of Consen and Earth ³⁰ Centre for Integrative Conservation, Jiositante of Ocean and Earth ³⁰ Research Martine Research Station, Jastara Ocean and Earth ³⁰ Research Martine Research Station, Justine, 67-4 Motopana	fa, 561-1193, Japan Emer, Biolizyo, Basaarch Institute for Global Change (RIGC), Japan Agency for hinar-dix, Yakoska, Kanagena, 237-0061, Japan Umbersity, 744 Metocka Nichi-ka, Fultsocka, NI +0095, Japan pan Agency for Marine-Barth Science and Technology, Yokishasna, Kanagewa, en Administration, #116, Nierodom Bibd., Pfinom Penh, Cambodia , Norwary 2, New Zealand 1, Severage 2, New Zealand 1, Starting, Surawuk, Kuching, Sarawak, Malaysia anak Rot, Masang Si Khai, Walin Chamop Diterici, Ubon Rasharhuni, 34140, Thailand Bonakiad Guiden, Chinee Academy of Sciences, Menghan, Janghong, 466300, China Sciences, University of Malaya, Kelantan, 16316, Malaysia
Wreet Basis Besearch Center, Cibi University, 1-1 Transglio, G. Marine Biodweily and Environmental Assessmer Research Marine-Earth Science and Technology (IAMSTEC), 2-15, Nature Tauffact of Decision Science for a Sustainable Society, Kywaho Topostrenet of Diversionmental Geochemical Cycle Research, Ja 236-0001, Japan Status Belowing, Nature Science, A. S. Santainable Society, Kywaho Taukowa Santainaba	fa, 561-1193, Japan Emer, Biolitzvi, Basaarch Institute for Global Change (BIGC), Japan Agency for himarchs, Yakosaka, Kanagawa, 237-0061, Japan Dinbersity, 744 Metoeka Nishi-ka, Fukuoka, R19-6095, Japan pan Agency for Marine-Earth Science and Fechnology, Yokishasna, Kanagawa, en Administration, #116, Norodom Bitd, Pfinom Penh, Cambodia , Norway 2, New Zaaland 2, Temer Sansowik, Ruching, Sarawask, Malaysia anak, Kaching, Serawak, Muliysia iamak Bd, Masang Si Khai, Waim Chamzup Eterrici, Ubon Rachashasi, 34190, Thaliand Ionanizal Gurdee, Chinese Academy of Sciences, Menghan, Jagloong, 666303, China Kamigamo, Kita-Ku, Stoph, 602-007, Japan Sciences, University of Malaya, Kelantas, 16310, Malapsia , Institute of Botany, Chinese Academy of Sciences, Xianghan, Haidian District,
Wreet Basis Besearch Center, Cibi University, 1-1 Tanagilo, G. Marine Biodweily and Environmental Assessmeric Besearch Marine-Earth Science and Technology (IAMSTEC), 2-15, Nature Marine-Earth Science and Technology (IAMSTEC), 2-16, Nature Science of Decision Science for a Sustainable Society, Kyuaha Disportment of Divisionmental Geochemical Cycle Research, Ja 236-0001, Japan Basad Pibatein Research and Development Institute of Fuberin Science, Taivenity of Acaditad, Acaditad, 14 School Elevisionment, Division, Natura Science, Nature Science, Nature Science, Nature Science, Division, Forth Deputition, Foreit Deputition, Boreleponet Development Basis, Jackina, 1250, Indonesis Basearch, Boteleponet Development, Daviena, Foreit Deputition, Boreleponet Development, Basis, Science Science, Scienc	fa, 561-1193, Japan Emer, Bioliziwi, Basaarch Institute for Global Change (BIGC), Japan Agency for him-chi, Vakoaka, Kanagrena, 237-0061, Japan Umbernity, 744 Motoeka Nihil-ku, Pukuoka, 813-6096, Japan pan Agency for Marine-Earth Science and Technology, Yokuhama, Kanaguwa, en Administration, #186, Norodom IBed, Planen Penh, Cambodia Norway 2, New Zealand 1 trueref Sacawak, Kuching, Sarawak, Malaysia tad, Kuching, Sarawak, Mulaysia tad, Kuching, Straway M, Mulaysia tanina Ed, Managri Si Khai, Waim Chanzup Diterict, Ubon Rathathani, 34140, Thaliand Ionanical Garden, Chinese Academy of Sciences, Mengkun, Jinghong, 666100, China , Emiliante of Botany, Chinese Academy of Sciences, Xianghan, Haidian Diterict, i Malaysia Terenggaren (UMT), Kusia Terenggarea, 21030, Malaysia
¹⁰ Iver Baiss Besench Cortes, Cillo University, 1-1 Transglio, G. Marian Biodweniy and Environmental Assessmers Research Mariane Earth Science and Technology (IAMSTEC), 2-15, Natura Technology, IAMSTEC), 2-15, Natura Technology, IAMSTEC, 2-25, Natura Technology, IAMSTEC), 2-15, Natura Technology, IAMSTEC, 2-25, Na	fa. 561-1193, Japan Emer, Bioliziwi, Besearch Institute for Global Change (BIGC), Japan Agency for him-the, Volocoka, Kanaguwa, 237-0061, Japan Dishernity, 744 Motooka Nibbi-ku, Pukuoka, 819-6095, Japan pan Agency for Marine-Earth Science and Technology, Yokubana, Kanaguwa, in Administration, #186, Norodom Bited, Pinnen Penh, Cambodia Norway 2, New Zeakand terrer Sazawak, Kuching, Sarawak, Malaysia tad, Kaching, Sarawak, Molaysia tad, Kaching, Sarawak, Mulaysia tad, Kaching, Sarawak, Molaysia tad, Kaching, Sirawak, Molaysia tad, Kaching, Sirawak, Molaysia tad, Kaching, Sirawak, Molaysia Sciences, University of Malays, Kelantas, 16110, Malaysia Sciences, University of Malays, Kelantas, 16110, Malaysia n, Institute of Borase, Channe Academy of Sciences, Xianghan, Haidan District, Malaysia Terrengganu (UMT), Kusia Terrenggana, 21000, Malaysia no, Coux Shipa, Sio-3111, Japan
¹⁹ Iver Baiss Beserch Center, Cills University, 1-1 Transglio, Cill Marian Biodiversity and Environmential Assessmers Research & Mariane Endiversity and Environmential Assessmers Research & Mariane Endiversity and Environmential Geochemical Cycle Research, and 20-6000, Japan ¹⁰ Isander Hinderine Research and Development Invitence of Folsert ¹⁰ Isander Hinderine Research and Development Neutrane of Folsert ¹⁰ Isander Hinderine Research and Development Neutrane of Folsert ¹⁰ Isander Hinderine Research and Development Neutrane of Folsert ¹⁰ Isander Hinderine, Distormity of Acatland, Acatland, J. Hol ¹⁰ School of Environment, University of Acatland, Acatland, Ind. ¹⁰ School of Environment and Innovation Division, Formt Depa ¹⁰ Research, Development Expatiment, Statuwak Beregp Hell ¹⁰ Department of Finderine, Ubon Rachathani University, 15 Sahlord ¹⁰ Centre for Integrative Conservation, Xubuarghanas Tropical ¹⁰ Rane Ky Laboratory of Vegatation and Environmental Chang Reight, Jabonatory of Vegatation and Environmental Chang ¹⁰ Restructure Jabonatory of Vegatation and Environmental Chang ¹⁰ Restructure Jabonatory of Vegatation and Environmental Chang ¹⁰ Restructure Technography and Environment (INOS), Universit ¹⁰ Restructure Schlander Station, Justiture of Northern Berlin ¹⁰ Restructure Schlander Research Station ¹⁰ Restructure Schlander ¹⁰ Restructure Schlander ¹⁰ Restructure Schlander ¹⁰ Restructure ¹⁰ Restruc	fa, 561-1193, Japan Emer, Bioliziwi, Basaarch Institute for Global Change (BBCC), Japan Agency for him-the, Vakooka, Kanagrena, 237-0061, Japan University, 744 Motooka Nibbi-ku, Pukuoka, 813-6095, Japan pan Agency for Marine-Barth Science and Technology, Vokshanna, Kanagawa, en Administration, #116, Norodom IBod, Planom Penh, Cambodia Norway 2, New Zashand
¹⁸ Breet Basies Besearch Center, Cibli University, 1-1 Transglio, Ci Marcine Biodiversity and Environmental Assessmers Research & Marine Earth Science and Technology (IAMSTEC), 2-15, Nature ¹⁸ Institute of Dechion Science for a Statianable Society, Kyuhai ¹⁸ Department of Dirvisonmental Geochemical Cycle Besearch, Ja ²⁹ Dealty of Bioscience and Again-Chiversito, Bold ¹⁸ Chol of Environment, Dulvenity of Acatland, Acctland, Ha ¹⁸ Diarden Stessen and Again-Chiver, New Universition, Bold ¹⁸ Chol of Environment, Dulvenity of Acatland, Acatland, Ha ¹⁸ Diarenth, Development and Danovalan Dirvison, Formt Depa ¹⁸ Research and Development Department, Sanuvak Energy Beth ¹⁹ Department of Fuhatein, Dulon Rachlandus University, IS Station ¹⁸ Genetaria Engenitive Conservation, Nationary Apparent ¹⁸ Genetaria Integrative Conservation, Nationary Apparent ¹⁸ Bachik Martine Research Station, Institute of Ocean and Entrip ¹⁸ Diarking and David Station, Justitute of Ocean and Entriport ¹⁸ Diarking and David Station, Institute of Ocean and Entriport ¹⁸ Diarking and David Station, Station (Dirots), University ¹⁸ Diarking Laboratory of Vegetation and Environmental Chang ¹⁸ Diarking and David Station, Point University, Science Hamilton (Dirots), Diarking ¹⁸ Dealter of Environment, Kyoto University, Science Hamilton ¹⁸ Dealter and Environment, Kyoto University, Science Hamilton ¹⁸ Dealter and Environment, Kyoto University, Science Hamilton ¹⁸ Dealter and Environment (Dirots), Dirots Steince, Science Center for Northern He ¹⁸ Yerei Takenychi and Birerykli Maranika constributed examily to no.	fa. 561-1193, Japan Emerg (Bollow), Bensarch Institute for Global Change (BIGC), Japan Agency for him-the, Volocoka, Kanaguwa, 237-0061, Japan University, 744 Motooka Nibbi-ku, Pukuoka, 819-6095, Japan pan Agency for Marine-Barth Science and Technology, Yokubana, Kanaguwa, in Administration, #186, Norodom Bitel, Pinnen Penh, Cambodia Norway 2, New Zeakand tutter/Sazawak, Kuching, Sazawak, Malaysia tadi, Kaching, Sirawak, Mulaysia tadi, Kaching, Sirawak, Mulaysia senak Rd, Maang Si Dalu, Wath Chamrap Dierici, Ubon Rachufusi, 54190, Thaland Bozakial Garden, Chinese Academy of Sciences, Menghun, Raghong, 666300, China Kamigaron, Kits-ku, Xyoto, 603-0847, Japan Sciences, University of Malaya, Kelantan, 16110, Malaysia n, Indrited Biotane, Chanerap Dierici, Jibon Rachufusi, 54190, Thaland Bozakiad Garden, UUMTY, Kusia Terenggana, 21030, Malaysia no, Cosu Shiga, 303-2113, Japan nghere, Biokkaido University, Aikappu 1, Akkenbi, Biokkaido, 088-1113, Japan itis Hudy.

5

Nature-based Solutions for climate change and biodiversity conservation



COP 15 in Montreal, Canada 5-17 Dec 2022



CBD Achi Target 11



- Yes 17% PAs achieved (when OECMs are included)
- BUT
 - Protected areas biased toward locations that were remote and less suitable for biodiversity
 - A percentage target on its own won't halt species extinction or loss of ecosystems and sites of ecological integrity



especially areas of particular importance for biodiversity and ecosystem services,

are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures (OECMs), and integrated into the wider landscapes and seascapes.

Result: 17% coverage just about achieved but protected and conserved \bigcirc areas often poorly sited from a biodiversity perspective, with many globally important sites omitted.

PER CENT GLOBALLY OF LAND AREAS AND OF SEA

especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conser-

vation measures (OECMs), and integrated into the wider landscapes and seascapes.



KUExamples: data use for conservation policies



Journal for Nature Conservation 20 (2012) 264-273



Using species distribution modeling to set management priorities for mammals in northern Thailand

Yongyut Trisurat^{a,b,*}, Naris Bhumpakphan^b, David H. Reed^c, Budsabong Kanchanasaka^d Department of Forest Biology, Faculty of Forestry, Kasetsart University, Bangkok 10900, Thailand * Kasetsart Biodiversity Center, Kasetsart Research and Development Institute, Kasetsart University,

vity Ranchole 50000 Theilersart knowersky Center, Kaorsant krywarch and Dreveogment asstuate, Kasersant o trenent of Biology, The University of Louisville, Laudioille, KT-40029, USA rement of Nacional Park, Wildlife and Plant Conservation, Bangkok 20900, Thailand ABSTRACT

ARTICLE INFO Article bistory: Received 5 September 2011 Received in revised form 4 May 2012 Accepted 10 May 2012 Notiversity Deforestation lots pots Mammals

Rapid deforestation has occurred in northern Thailand and is expected to continue. Thus, identification and protection of sufficient amounts of the highest quality habitat is urgent. Wildlife occurrence data were gathered along wildlife trails and parcolling routes in protected areas and Sevest parches outside of protected areas. Geographic fallormation Systems, boo-physical and antihupopeneity variables were used to protection at the design particular mathematical protection of the properties of the properties of the protection of the determine future withitle literats and aid decisions-making concerning which areas to protect. The results revealed that the total extent of suitable habitats for the studied species cover, approximately 57% of the region. Nearly 70% of the total habitat for endangered and vulnerable species is predicted in Large and contiguous protected areas. Threatened areas with high hiodiversity encompass approximately 1.3% of the region, and 66% of this figure is predicted to occur in existing protected areas. Based on the model outcomes, we recommend reducing human pressures, enhancing the density of prey species and conse vation outside protected areas, as well as increasing connectivity of suitable habitats among protected areas that are too small to maintain viable populations in isolation.

© 2012 Elsevier GmbH, All rights reserved

all species (Miller & Allen 1994; Mittermeier et al. 2004). Species

targets (e.g., endangered and at-risk species, keystone species, indicator species, and umbrella species) are normally selected by

planners depending on what they seek to conserve within a syster

of conservation areas (Groves 2003; Roberge & Angelstam 2004)

Besides species selection, predicting species distributions is also important because the models are able to estimate the relationship

istics of those sites (Guisan & Zimmermann 2000; Yost et al. 2008)

and modeling results are essential inputs for informed conservation

planning, mapping patterns of biodiversity, detecting distributional changes from monitoring data and for quantifying how variation

in species performance relates to one or more controlling factors

(Sanderson et al. 2002: Trisurat et al. 2010b). In the last two decades

many modeling techniques have been developed for this purpose Regression models (e.g., generalized linear models - GLM and gen

eralized additive models - GAM) are used (Elith et al. 2011) where species data have been collected systematically by surveying a set

of sites and recording the presence/absence of species at each site

However, in many countries complete and systematic biodiversity survey data are limited and species records are usually available

in the form of presence-only data. Therefore, species distribution

between species records at sites and the environmental character

The establishment of priorities for biodiversity cons is a complex issue (Margules & Pressey 2000). Questions like: which areas and species should be given priority, given the money available for conservation; and which actions would be most cost-effective in slowing the current rate of biodiversity loss are important to biodiversity conservation. In order to answer these questions it is important to map current species distributions to preserve the most critical habitats for selected species and to have knowledge concerning how to manage and/or restore existing habi-tat (Gaston 2000; Trisurat et al. 2010b). Arglobal level, Myers (1988, 1990) and Mittermeier et al. (2000, 2004), identified biodiversity hotspots, where high concentrations of endemic species are under going exceptional loss of habitat as a means of setting priorities for diversity conservation. One dilemma with mapping concerns which species should be evaluated because it is impossible to map

Corresponding author at: Faculty of Forestry, Kasetsart University, Bangkok 10900, Thailand. TeL: +65 2 579 0176; fax: +66 2 942 8107.
 E-mail ofdress: #Soryyt@ku.ac.th.(Y. Trisurat).

1617-1381/\$ - see front matter © 2012 Elsevier GmbH. All rights reserved. http://dx.doi.org/10.10163.jnc.2012.05.002



2) National – Thailand



Can Thailand Protect 30% of Its Land Area for Biodiversity, and Will This Be Enough?

Nirunrut Pomoim 1,20, Yongyut Trisurat 3, Alice C. Hughes 1,4 and Richard T. Corlett 1,4,*0

- ¹ Center for Integrative Conservation, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Menglun 666303, China; nirunrut@xtbg.ac.cn (N.P.); ach_conservation2@hotmail.com (A.C.H.)
- ² University of Chinese Academy of Sciences, Beijing 100049, China
- ³ Faculty of Forestry, Kasetsart University, Bangkok 10900, Thailand; fforyyt@ku.ac.th
- ⁴ Center of Conservation Biology, Core Botanical Gardens, Xishuangbanna Tropical Botanical Garden,
- Chinese Academy of Sciences, Mengla 666303, China
- * Correspondence: corlett@xtbg.org.cn

Abstract: The draft post-2020 Global Biodiversity Framework asks CBD parties to conserve at least 30% of the planet by 2030 'through a well-connected and effective system of protected areas ... with the focus on areas particularly important for biodiversity'. We use Thailand as a case study for the ability of a densely populated, hyper diverse, tropical, middle-income country to meet this target at a national level. Existing protected areas (PAs) total 24.3% of Thailand's land area. Adding forest on government land adjacent to existing PAs, plus unprotected areas of Ramsar sites, raises this to 29.5%. To assess the importance for biodiversity, we used modeled distributions of birds and mammals plus, as proxies for other biodiversity components, elevation, bioclimate, forest type, and WWF ecoregion. All modeled species occur in the current PA system but <30% meet representation targets. Expansion of the system increases the proportion of mammals and birds adequately protected and increases the protection for underrepresented bioclimatic zones and forest types. The expanded system remains fragmented and underrepresents key habitats, but opportunities for increasing protection of these are limited. It is also still vulnerable to climate change, although projected impacts are reduced. Additional protection is needed for wetland and coastal habitats, and limestone karsts.

ECOGRAPHY

Research

30% land conservation and climate action reduces tropical extinction risk by more than 50%

Lee Hannah, Patrick R. Roehrdanz, Pablo A. Marguet, Brian J. Enguist, Guy Midgley Wendy Foden, Jon C. Lovett, Richard T. Corlett, Derek Corcoran, Stuart H. M. Butchart, Brad Boyle, Xiao Feng, Brian Maitner, Javier Fajardo, Brian J. McGill, Cory Merow, Naia Morueta-Holme, Erica A. Newman, Daniel S. Park, Niels Raes and Jens-Christian Svenning

L. Hannah and P. R. Roehrdanz (https://orcid.org/0000-0003-4047-5011) 🖾 (prochrdanz@conservation.org), The Moore Center for Science, Conservation International, 2011 Crystal Dr., Arlington, VA 22202, USA. – P. A. Marquer, D. Corcoran and J. Fajardo (https://orcid.org/0000-0002-0990-9718), Dept de Ecología, Facultad de Ciencias Biológicas, Pontificia Univ. Católica de Chile, Santiago, Óhile. PAM, DC and JF also at: Instituto de Ecología y Biodiversidad (IEB), Santiago, Chile. – PAM and B. J. Enguist, The Santa Fe Institute, USA, Santa Fe, NM, USA. – BJE, B. Boyle, X. Feng, B. Maimer amaterinami (12m), amingto, Unite. – privo ana da j. tangina, troe satud e e minitari, Usor, Satu e e, (10), Osci, a. Sobje A. reng, a. Inational and E. A. Nemani (Incidentia) (2000). 2001–2013 (2000). 2001
2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (2000). 20010. 2001–2013 (2000). 2001–2013 (2000). 2001–2013 (org/0000-0003-2783-530X), Dept of Organismic and Evolutionary Biology, Harvard Uniu, MÅ, USA. – N. Raes (https://orcid.org/0000-0002-4329-4892), Naturalis Biodiversity Center, Leiden, the Netherlands. – J.-C. Svenning (https://orcid.org/0000-0002-3415-0862), Center for Biodiversity Dynamics in a Changing World (BIOCHANGE), Dept of Biology, Aarhus Univ., Aarhus, Denmark.

Ecography 43: 943-953, 2020 doi: 10.1111/ecog.05166 Subject Editor and Editor-in-Chief: Miguel Araújo Accepted 21 February 2020

Limiting climate change to less than 2°C is the focus of international policy under the climate convention (UNFCCC), and is essential to preventing extinctions, a focus of the Convention on Biological Diversity (CBD). The post-2020 biodiversity framework drafted by the CBD proposes conserving 30% of both land and oceans by 2030. However, the combined impact on extinction risk of species from limiting climate change and increasing the extent of protected and conserved areas has not been assessed. Here we create conservation spatial plans to minimize extinction risk in the tropics using data on 289 219 species and modeling two future greenhouse gas concentration pathways (RCP2.6 and 8.5) while varying the extent of terrestrial protected land and conserved areas from <17% to 50%. We find that limiting climate change to 2°C and conserving 30% of terrestrial area could more than halve aggregate extinction risk compared with uncontrolled climate change and no increase in conserved area.

Keywords: area-based conservation, biodiversity, climate change, conservation planning, extinction risk

4) Digital Atlas of TH's Biodiversity

3) Regional – Tropical Asia

MDPI





KU

(1)

Northern Thailand

- Size: 172,277 km² (1/3)
- Forest cover
 - year 2002: 57%
 - Predicted in 2050: 50%
- PAs: 24%, planned 31.2%
- Climate

Current

2050 (B2A scenario)

Mean T. = 25.4 °C Max T = 35.6 °C Min T. = 13.4 °C Rainfall = 1,232 mm Mean T. = 27.1 °C Max T = 38.0 °C Min T. = 15.2 °C Rainfall = 1,301 mm

Species Distribution Modeling for 17 mammals

amunuooo andifuoqnabuuuunalnajiluutsunalnu (Status of Lerre Mammals in Theiland)

DNP, 2010

Coping Capacity

Trisurat et al (2012)

GEF Funded Project through Cl

Spatial Planning for Protected Areas in Response to Climate Change

Appendix Asia Pacific Biodiversity Observation Network

Can Thailand protect 30% of its land area for biodiversity and will this be enough?

- Forest area remaining 31.7%
- protected areas planned 24%

Key Questions.....?

How can Thailand meet the proposed CBD area target of 30% by 2030?

Will the 30% be "well connected" and important for biodiversity?

How vulnerable will this 30% be to climate change?

Pomoim et al. (2021)

KU How to achieve 30% of protected areas?

- Forest patches >10 km² adjacent to PAs cover 5.2%
- Other effective area-based conservation measures
 (OECMs: Ramsar site, water catchment, KBAs) cover 0.04%
- Smaller and isolated forest patches, may support viable species 0.5%

Increased patch size and well connected

Protected	tected Number of patches				Mean	Mean distance	
area	<100	100-1000 km ²	>1000	total	area	to nearest large	
	km²		4 km²		km²	patch (km)	
24.3%	570	80	20	670	188	14.3	
29.5%	520	69	19	608	251	12.5	
					Pom	noim et al. (2021)	

Observation Networ

Well protect biodiversity?

Based on **SDMs of 702 bird and 80 mammal** species obtained from GBIF

Increase in adequately protected species

- **from 28% to 60% of mammals**
- **from 26% to 38% of birds**

Increase in the area of under-represented forest

Deciduous Dipterocarp Forest from 42% to 62%

Mixed Deciduous Forest from 61% to 81%

Bioclimatic zone	Total area of zone (km²)	% of zone protected		% of total area protected		% of forest cover protected	
		24.3%	29.5%	24.3%	29.5%	24.3%	29.5%
Extremely Hot and Moist	262852	28.5	35	63.1	63.1	83.1	86.3
Extremely Hot and Xeric	200660	3.9	6	6.6	8.2	69.9	80.2
Hot and Mesic	43791	72.2	83.4	26.6	25	92.4	93.7
Hot and Dry	5818	76.5	88.8	3.7	3.5	93.2	93.6
Warm Temperate and Mesic	83	91.6	97.6	0.1	0.1	100	98.8

SE Asia Tropics Conservation Priorities under Climate Change

Asia-wide Analysis: SDM for 80,000 Plants and 30,000 Vertebrates (GBIF and BIEN)

Corridor Index

B*P***EN**

Legend

Plot location

Province

Source: DNP (2017)

4) Digital Atlas of TH's Biodiversity

Received: 28 September 2019 Revised: 24 November 2019 Accepted: 28 November 2019 DOI: 10.1111/1440-1703.12105

SPECIAL FEATURE

WILEY

Data rescue-collection of precious and laborious in situ observed data

Systematic forest inventory plots and their contribution to plant distribution and climate change impact studies in Thailand

Yongyut Trisurat¹ | Wichan Eiadthong¹ | Weeraphart Khunrattanasiri¹ Somyot Saengnin² | Auschada Chitechote² | Sompoch Maneerat²

1Faculty of Forestry, Kasetsart University, Bangkok, Thailand ²Department of National Parks, Wildlife and Plant Conservation, Bangkok, Thailand

Correspondence

Yongyut Trisurat, Faculty of Forestry, Kasetsart University, Bangkok, Thailand. Email: fforyyt@ku.ac.th

Funding information Thailand Research Fund (TRF), Grant/ Award Number: DBG6080017

Abstract

Thailand is recognized as having high species richness both flora and fauna The systematic plant taxonomy and collection was initiated in 1957-1958 However, the distribution of specimen collections is uneven and mainly located near road networks. The Royal Forest Department (RFD) has since 2001 initiated the systematic uniformly fixed grids of 20 km × 20 km for measuring trees and their environments with the financial and technical support from the International Tropical Timber Organization. After the reorganization of the RFD in 2002, the Department of National Parks, Wildlife and Plant Conservation of Thailand, which then was separated from the RFD, has carried on this project and added the uniformly fixed grids ranging from 2.5 km × 2.5 km to 10 km × 10 km over the entire protected areas in Thailand. Throughout three project phases (2001-present), there are over 3,150 plots collected from 59 provinces, while the remaining 18 provinces do not have monitoring plots because of either the security issue or no forest covers. There were, based on altogether 24,605 occurrence records of trees with a diameter greater than 4.5 cm at breath high level from 363 species from 81 families and 222 genera. Trees belong to Dipterocarpaceae, Lamiaceae, Burseraceae, Phyllanthaceae, Malvaceae and Fabaceae families are dominant. Besides for simple estimation of tree density and volume, the data were used for bio-geographical and climate change impact studies.

Raw data

FLORA OF THAILAND

GBIF

BIEN/GBIF: Thailand 659 spp.; 1,471 record ITTO/RFDS/DNP: 24,605 records 376 species

SDMs for 201 spp. with >20 occurrences

Systematic Forest Inventory Number of plate Exte

RFD/DNP

spacing	rear	Number of plots	Extent	Responsible agency	Kemarks
1.5 km × 1.5 km	2001-2003	903	Country	RFD/ITTO	Designed and pilot project
20 km × 20 km	2004-2007	1,285	Country	RFD/ITTO	Entire country but 158 plots un-established
10 km × 10 km	2004-2005	10,372	Country	RFD/DNP	Only inside remaining forest cover
5 km 🗙 5 km	2006-2010	14,152	Protected area	DNP	Using a 0.1 ha plot center
10 km \times 10 km	2011	859	Country	DNP	Using a 0.1 ha plot center
2.5 km $ imes$ 2.5 km a	2012-present	4,500	Protected area	DNP	Using a 0.1 ha plot center

GIS geo-species mapserver

🗉 🜀 wave of cartography - Goo<u>c</u> 📄 Geo-Species (DIY)

俞

i geospecies.dyndns.org/GeoSpecies/examples/tree/geomap.html

Digital Atlas of Trees and Wildlife in Thailand

+

V

X

Will be maintained by KU& Korea/NIE

D

B

≦

Biodiversity

Network

Data Use for International Platforms for Policies

Challenges

- To transform analog dataset to standardized digital database (information management system: **IMS**) avoid data entropy
- To promote the system to **share and synthesize** data to be used within the region and to address a large scale questions CC.
- To embed dataset and research results into **policy implementation**

Opportunities

- Collaboration (e.g., APBON, ILTER, GBIF, Korea/NIE, KBAs), networking and facilities are in place.
- Establishment of Thailand Biodiversity Information facility (TH-BIF) by ONEP
- Biodiversity data greatly contribute to CBD, KBAs, NBSAP, IPCC etc.