

Summary of the discussion of marine group

Take

Worked with Mark, Sheila, Po, Kawagoe

Questions to plenary


- Past activities of Marine members (just introduction of each works?)
- Allocation of our statement of our outline (as appendix?)
- Website (Who will update? Try to find funds?)
- Suggest people top invite as members
- Membership of potential members (Share by email, advertise GEOSS-AP and if formally add to BON?)

Why does society need an AP mBON? now?

- Urgent need to know what is happening to marine biodiversity in the Asia-Pacific region. This region has the highest density of terrestrial, freshwater and marine species on Earth.
- How is it responding to climate change? How are species of economic and ecological importance changing? How are communities changing? How will these changes affect food webs and ecological interactions?
- How are other human and natural impacts affecting biodiversity
- Demand for evidence to support progress towards SDG and Aichi Targets; Demand for input to IPBES and UN World Ocean Assessment ; Preparations for the Decade of the Ocean 2020-2030 are underway
- AP mBON will contribute to AP BON, MBON of GEO BON , GBIF, OBIS IPBES WoA

How to form AP mBON

- Form steering committee – possibility of a host Secretariat?;
- Grow membership;
- Host workshop for members;
- Find post-doc with time and skills to synthesise data from GBIF, OBIS, and members ;
- Use Social media to communicate activities – Website, Facebook, Twitter, ResearchGate;
- Act as broker for linking experts to each other and to wider international activities;
- Manage and Publish data in new environmental schema of Darwin Core



We will share our outline and workplan to potential members and website


- Mark suggested over 20 potential members and Take will introduce AP-BON at conferences
- The AP BON Website would be best managed by a secretariat and collaboratively populated by the AP BON membership

Opportunities

- Revive NaGISA;
- Foster engagement with existing activities for seagrass (SE Asia seagrass network, Indo-Pacific Seagrass Network (IPSN)),
- coral reefs (Global Coral Reef Monitoring Network (GCRMN)), marineGEO,
- Reef Life Survey (RLS),
- Plankton surveys
- Map places where components of marine biodiversity are being monitored.;
- Use existing data in OBIS, GBIF, BOLD, and GenBank. ;
- Overlay satellite and aerial remote sensing data over the region. ;
- Pole to Pole (P2P) comparison with P2P MBON in Americas;
- Genetic variation from mountain to deep sea;
- Genetic variation with latitude;
- Contribute to updating criteria for Key Biodiversity Areas.

Analysis available data, including mapping are priorities for next 3 years

- Address issues associated with data sharing and data availability
 - Some countries hesitate to share data
 - Changes in the Darwin Core have to be communicated so that it could be applied and old data transferred
- Update the maps of seagrasses, algae and coral reefs using RS and literature
- Build a GIS database
- Modeling distributions same variables on land and sea
- existing research that can be used as starting points eg <http://www.oceansofbiodiversity.auckland.ac.nz/>



Facilitate gathering the information of recent topics can be additional plan.

- Ecosystem service
- Pollution especially plastics (Where are the microplastics? Measuring impacts of microplastics on biodiversity)
- Image data for AI taxonomy
 - It will be discussed with more broad members, maybe added more (such as about genetics, eDNA, and fish if anyone do)

Data analysis reviewing and mapping

- Monitoring
 - Establishing Observation sites, - identify and produce maps where marine biodiversity is being monitored
 - Collect and integrate Reef cover data from regular monitoring including
 - Bleaching events
 - Online updating of data in specific website
- Use of remote sensing data
 - Monitoring Temperature
 - Temporal change, monitoring corals, seagrass, algae and mangrove (if any help from forestry)

Facilitate gathering the information of recent topics can be additional plan.

- *Land-sea connection (small island ,Unesco MAB (Ranong in Thai anywhere in Philiphine), Okinawa by H.Yamano, Kyoto Univ. program, CIFOR global landscape & GLF event?)*
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Tasks

- Our outline and Plan (Mark)
- AP BON overview and workplan (Take)
- Website (Sheila)
- Existing marine networks (e.g., WESTPAC, ReefCheck,) (Po Teen)
- Posters, brochures (Po Teen)

Outreach

- AP BON's web presence is very low
 - FB Page suggested for AP BON and someone / some organization to continuously update and manage the page
 - Research Gate also suggested
- Use of good graphics
- Share infographics developed by partnership


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Examples of potential activities

- State of Biodiversity
 - Seagrasses
 - Genetic diversity
 - Using hypoxia as an indicator
 - Ecosystem health and marine biodiversity
- Pollution Studies
 - Waste management and marine biodiversity (gut contamination, entanglement)
 - Impact of Micro plastics as an issue has significant impact as it enters the food pathway and affects zooplankton, invertebrates and other filter feeders



Facilitate gathering the information of recent topics can be additional plan.
It will be discussed with a broader membership

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Draft work plan of Asia Pacific Marine BON (AP-MBON) for three years 2019 to 2021

"Networking networks and revive past activities"

"Facilitate broad scale researches and production of infrastructure"

" Feasibility to obtain data of recent issues : ecosystem services and debris"

"Outreaching and increase communication of people"

Take Yamakita

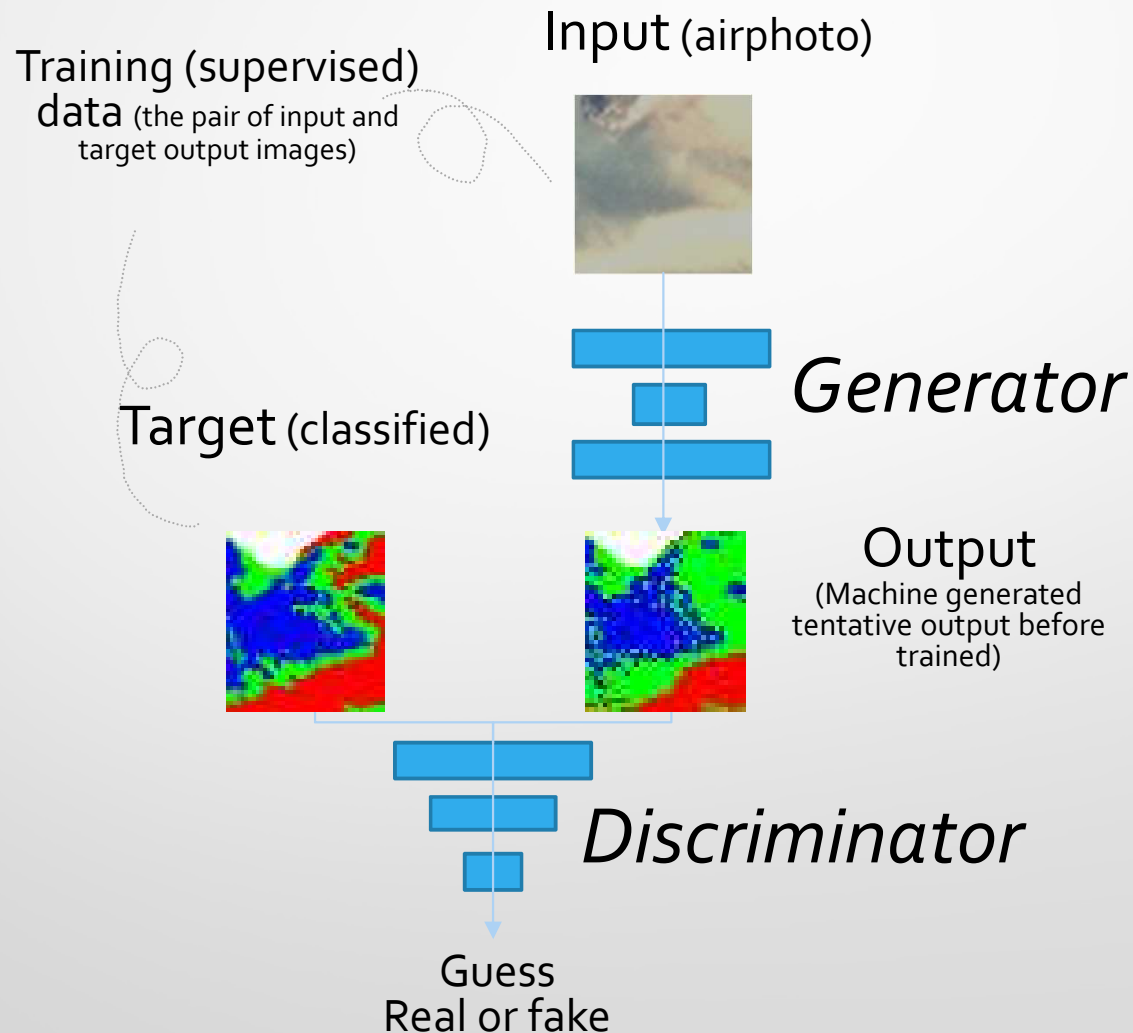
*Networking networks and revive past activities to observe temporal changes

- There are several ongoing research programs focusing on networking among locations in Asia Pacific area. It was especially abundant in the Coral Triangle. Considering such conditions, a major activity of the Marine part of the AP-BON (AP-MBON) on the **next three years should be focus on listing up and linking existing program and research network**. It will also include reviewing and comparing results and existing datasets in this area.
- Considering existing members of AP-MBON, it is also **encouraged to have funding to revive previous census network such as NaGISA to observe temporal dynamics of biodiversity**. Changes of biodiversity in temporal scale and local developments are expected to occur in the era of rapid development of this area and rising global temperature.
 - Mapping existing monitoring or core study sites and review gaps
 - **Adding data into new quantitative format of Darwin Core** if there is any update facilitate them to publish and upload

*Facilitate broad scale researches and production of infrastructure

- Considering past activity of the terrestrial group of the AP-BON, facilitation of broad scale researches considering changes in terrestrial area should be focused.
- For that purpose, it is expected to extract distribution of foundation species more accurately than what previously done. For example, we are expecting extraction of distribution of ecosystems from literatures including which published in local languages. We also expecting extraction of distribution of ecosystems and evaluation of habitat status using recent remote sensing technics using recent technics such as deep learning and drones. Extending areas for these analyses obtaining extra funding also encouraged.
- After achieving large scale dataset, we will expect to evaluate status of those ecosystems in certain area or broad scale analysis.
 - Update map of seagrass, algae and coral reefs using RS and literature
 - Building GIS database
 - Modelling distribution including terrestrial variables

Application of the deep-learning technics for the extraction of seagrass beds:

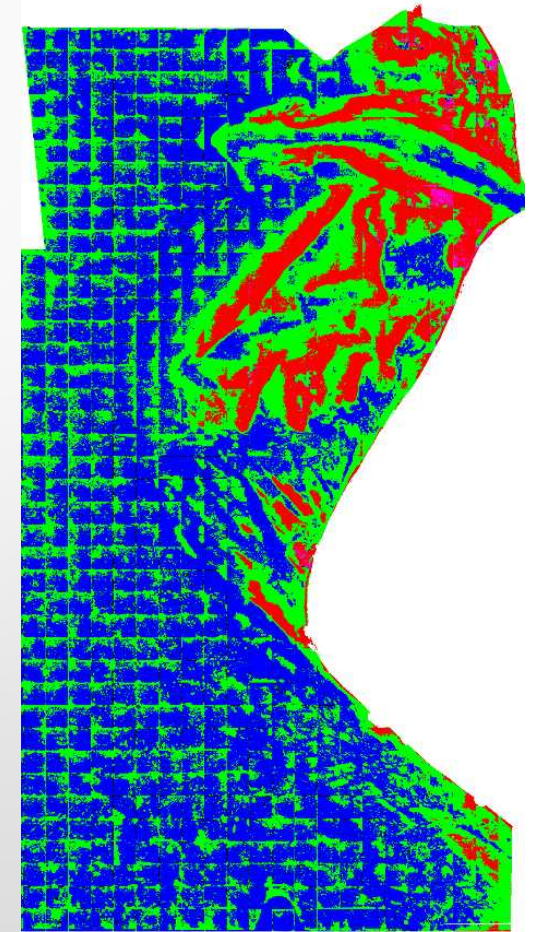
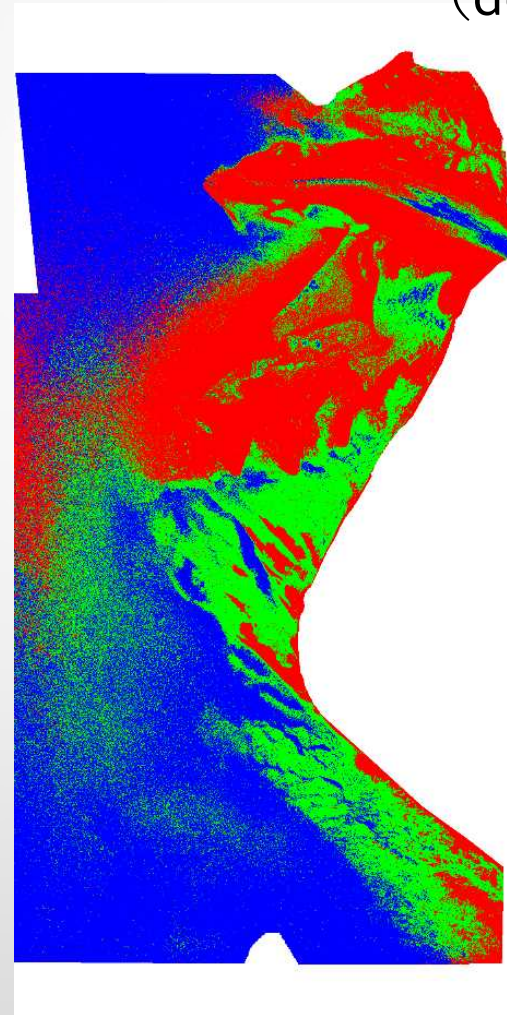
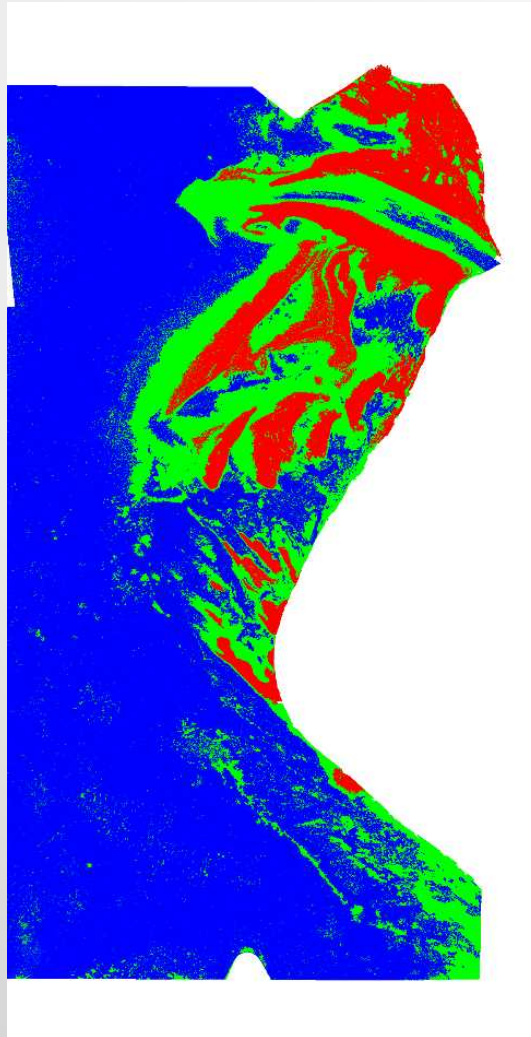


a) Aerial Photographs

b) Manual extraction (considered as the most accurate)

c) Semi automatic extraction

d) Automatic extraction
(deep learning using gray)



*Feasibility to obtain data of recent issues ecosystem services especially about usage data of people and marine debris especially microplastics

- Considering recent increase on evaluation of ecosystem service our network also expected to have trial to evaluate values in ecosystem services. The service will include from fishery products, carbon storage, coastal protection and usage data of the ecosystem as example. The data type will be usage data written in statistics and field survey which testing feasibility to observe usage by different ways such as interview, observation and web questionnaire as example. Digging data in local reports are also encouraged. After achieving trial data, it is also expected to evaluate feasibility to evaluate ecosystem by different aspect.
 - Expecting output of S15 PANCES for Japan and any additional works start in any countries.
 - More...
 - Expecting output of project about microplastic in JAMSTEC and any additional works in any countries.
 - Use of AI taxonomy of fish

Potential diving spot and Coral reef area

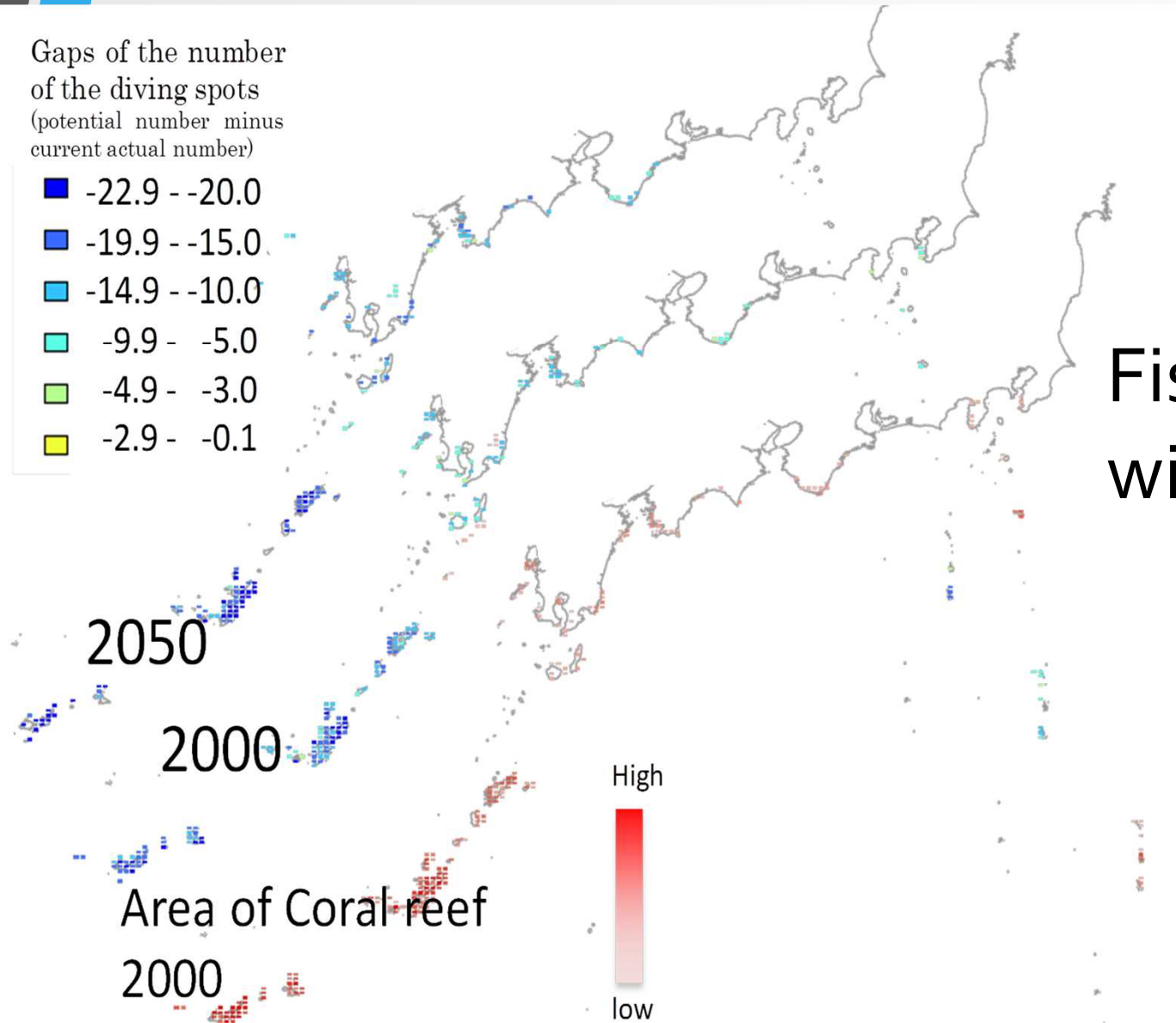
Carbon absorption



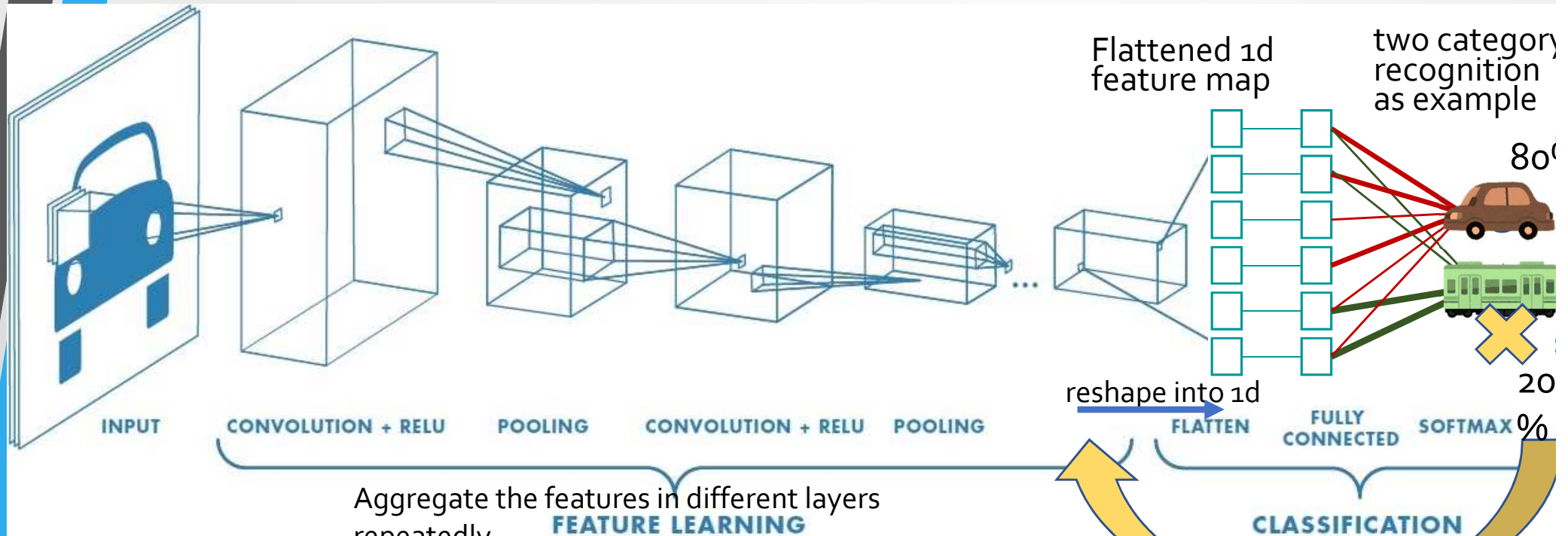
Gaps of the number of the diving spots (potential number minus current actual number)

- -22.9 - -20.0
- -19.9 - -15.0
- -14.9 - -10.0
- -9.9 - -5.0
- -4.9 - -3.0
- -2.9 - -0.1

Fish catch related with coastal habitat



Ai taxonomic data base



Input

0	1	1	0
1	0	1	0
1	0	1	0
0	1	0	0

Filter (convolution) & Activation Function (ReLU)

Feature map

0		

Pooling (using Max)

0	3	1	5
1	6	2	4
1	2	1	3
7	1	1	2

6	5
7	3

Back propagation of errors to optimize Features and weights

*Outreaching and increase communication of people

- Achieving capacity building using AP-BON network is expected. Capacity building will be from citizen, government and researches. Communication with national agency also encouraged not only from the aspect of the outreaching but also application of our outcomes and fundraising.
- Our main objective about networking also expected to help to listing up the information about training opportunity in related conferences, university open classes, seminars and workshops.
- Considering this area helping communication of different languages are also important. Not only translation of picture books and methodological information but also use of easy understanding images such as pictures, info graphics and cartoons are also encouraged.
 - Listing up existing seminars, open courses and conferences
 - Any funding to write simple Picture Book ?



Potential networks

- <https://www.isbw13.org/programme-and-events/international-seagrass-biology-workshop-13/>
- <https://www.icriforum.org/gcrmn>
- <https://indopacificseagrass.network/read-more-about-ipsn-membership/>
- https://www.google.com/search?q=Southeast+asia+seagrass+network&tbm=isch&source=iu&ictx=1&fir=7E689tkWyS5BgM%253A%252C8BHyAfPXp8NXBM%252C_&usg=__FFodCnKAgbzUkn15Ssu7Vd9kbgQ%3D&sa=X&ved=oahUKEwij6cb c4YncAhVEXisKHTYGDW8Q9QEIRjAG#imgsrc=7E689tkWyS5BgM:
- http://mits10.aori.u-tokyo.ac.jp/asiacore/outline_e.html
- DOPA, S15