



Activities on Marine and Coastal Biodiversity Assessments

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Presentation outline

- NOWPAP introduction
- Threats to biodiversity in the NOWPAP region
- Activities implemented by NOWPAP DINRAC (2007)
- UNEP-led Global Outlook (2010):
using Pressure-Status-Response (P-S-R) indicators
- Asia-Pacific Network for Global Change Research (APN)



Northwest Pacific Action Plan



NOWPAP

- **History**

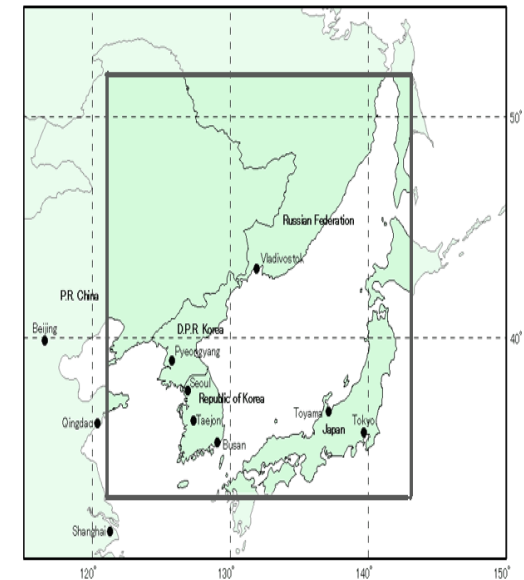
Established in 1994 by *the People's Republic of China, Japan, the Republic of Korea and the Russian Federation* as an integral part of **UNEP Regional Seas Programme (RSP)**

- **Goal**

wise use, development and management of the coastal and marine environment so as to obtain the utmost long-term benefits for the human populations of the region, while securing the region's sustainability for future generations



UNEP Regional Seas Programmes



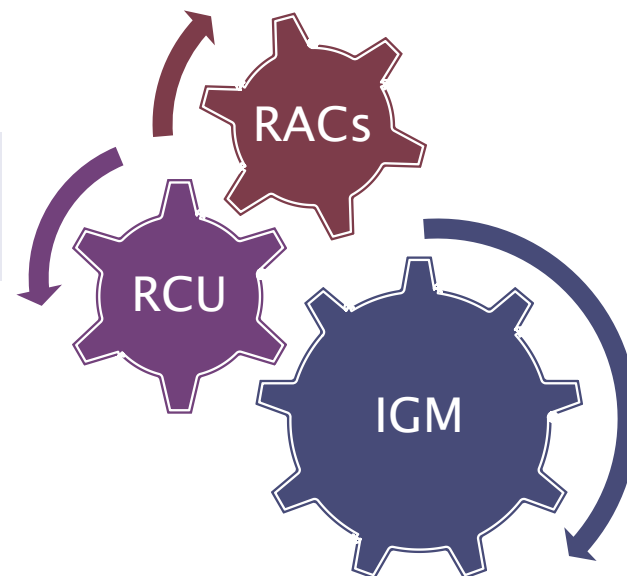
NOWPAP sea area:
33-52°N, 121-143°E



NOWPAP Mechanism



- CEARAC**
Japan - Special Monitoring and Coastal Assessment
- DINRAC**
China - Data and Information Network
- MERRAC**
Korea - Marine Environment Emergency Preparedness and Response
- POMRAC**
Russia - Pollution Monitoring





Major threats to biodiversity



Climate Change

affecting physical (currents and circulation patterns) and chemical (acidification, nutrient availability) parameters

Habitat Destruction

affecting fish and shellfish stocks

Invasive Species

spreading, as shipping density (traffic) increases; endangering the native species

Overfishing

driving ecosystem changes, incl. biodiversity changes

Pollution

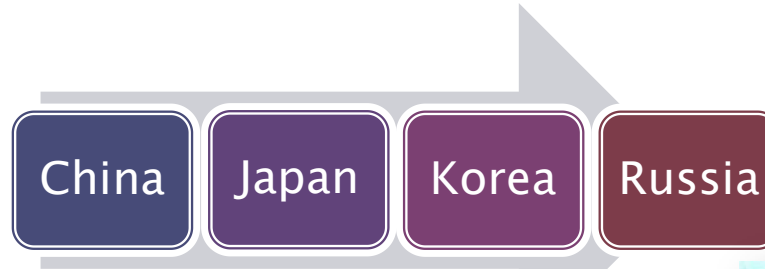
affecting coastal habitats



Northwest Pacific Action Plan



NOWPAP DINRAC

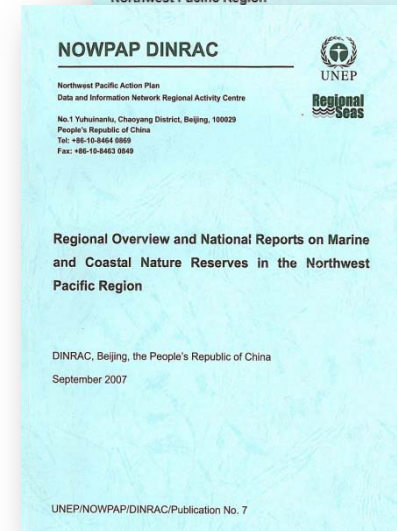
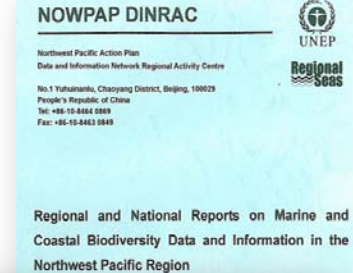


1. “Regional and National Reports on Marine and Coastal Biodiversity **Data and Information** in the Northwest Pacific Region”

- Introduced the status of marine and coastal biodiversity and related ecosystems*
- Understood current status of data and information on marine and coastal biodiversity*

2. “Regional and National Reports on Marine and Coastal **Nature Reserves** in the Northwest Pacific Region”

- Established a database on marine and coastal nature reserves*
- *Improved understanding on the current situation and future developments of nature reserves*



NOWPAP DINRAC (2007)



Biodiversity in the NOWPAP region



2010-2011:

- **UNEP- led *Global Outlook Report*** on the State of Marine Biodiversity, launched at CBD COP-10
- **Long-term assessment for the NOWPAP region**, using external funding
- **Development of the new marine environment assessment method** focusing on marine biodiversity (by NOWPAP CEARAC)

First Regional Workshop:

7 September 2009 in Toyama, Japan,
financially supported by **UNEP RSP**





Northwest Pacific Action Plan



Marine and Coastal Biodiversity Assessment

Assessment of marine and coastal biodiversity in the NOWPAP region **upon the decision of the 14th NOWPAP IGM decision**



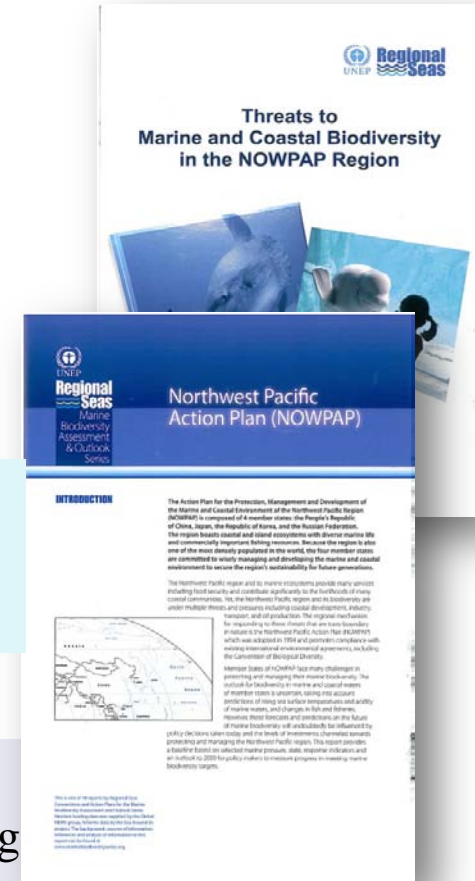
Rapid assessment of the current status marine and coastal biodiversity in the NOWPAP region **as part of the UNEP Global Outlook on Marine and Coastal Biodiversity**

Some key findings were:

Pressures : rising fish catches; high level of nutrient loading
increasing shipping volumes; rising sea surface temperature

State : decline in **Marine Trophic Index (MTI)**

Response : fish stock agreements; Establishment of MPAs





UNEP Global Outlook Report

“Marine Biodiversity Assessment & Outlook *Indicators*”

Pressures

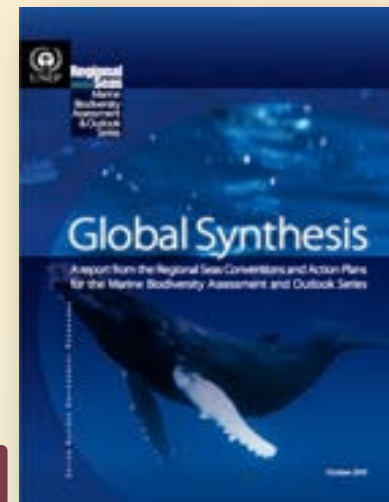
- Nutrient Loading
- Sea Surface Temperature
- Fish Landings
- CO₂ Flux
- Port Activity

State

- Marine Trophic Index (MTI)
- Fish Stocks
- Marine Fauna-Red List
- Acidification

Response

- MPAs
- GPA
- Fish Stock Agreements
- Ballast Water Regulations
- Climate Change Programmes



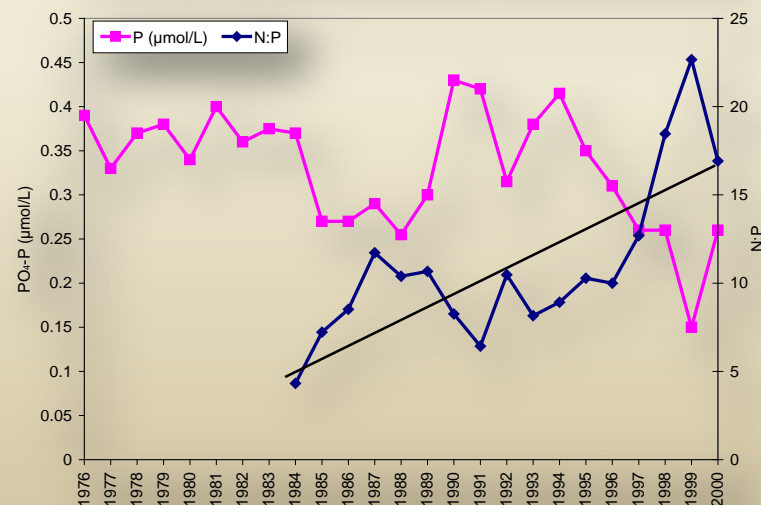
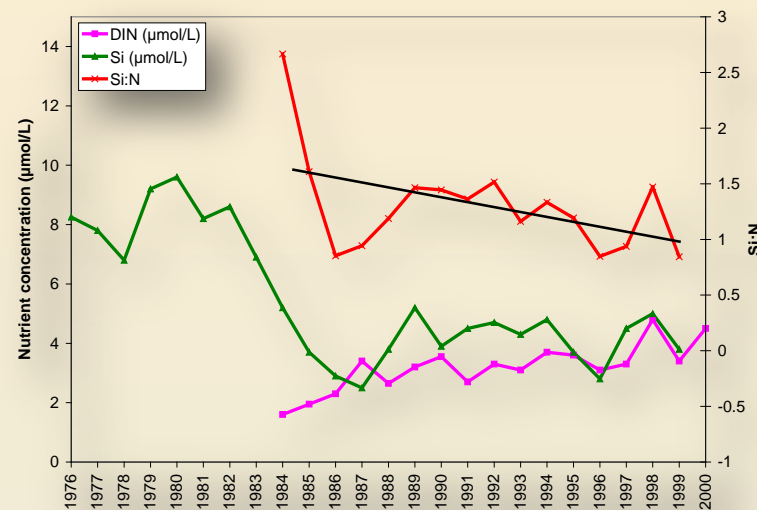


Marine Biodiversity Assessment: Pressures

1. Nutrient loads

- *Excessive input of nutrients* leads to *eutrophication* of coastal waters with limited water exchange and changes in phytoplankton communities
- In the Yellow Sea, changing *nutrient ratios* cause shifts in phytoplankton communities
- As a result of excessive nutrients input affecting coastal phytoplankton communities, the whole food chain is affected, causing *changes in coastal and marine biodiversity*

Lin et al, (2005)

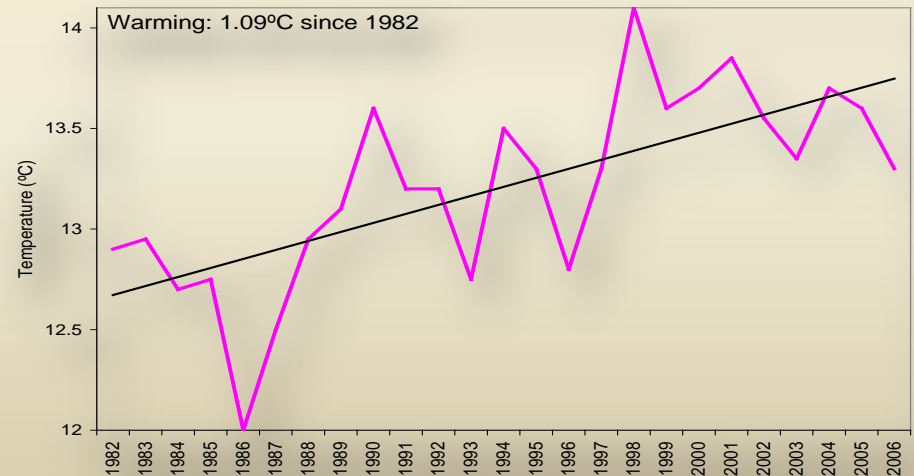




Marine Biodiversity Assessment: *Pressures*

2. Sea surface temperature

- Between 1982 and 2006, there was a warming of ***0.67 °C*** and ***1.09 °C*** in the Yellow Sea and in the eastern part of the NOWPAP sea area, respectively
- Higher water temperature affect ***species distribution and migration***, can result in ***mistiming of biological events***



Redrawn from Belkin (2009)



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Marine Biodiversity Assessment: *State*



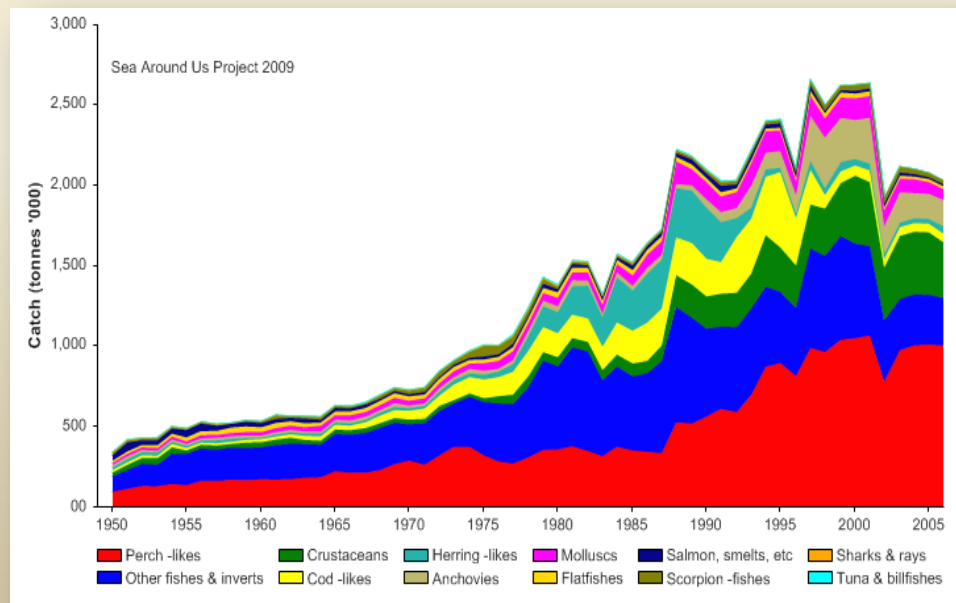
1. Overfishing

Significant growth in fisheries harvests from the sea, e.g.:

Catches in the Yellow Sea increased from 400,000 tonnes in 1950s to more than 2.5 million tonnes around 2000 (*UNDP/GEF 2009*)

Sea Around Us Project (2009)

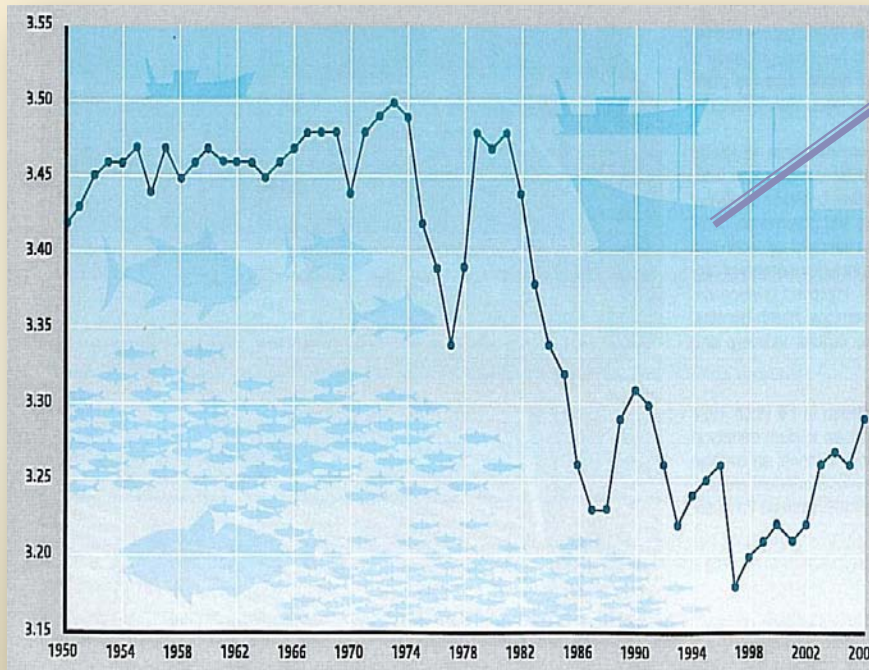
Fishing effort might exceed ecosystem carrying capacity





Marine Biodiversity Assessment: *State*

2. MTI



Marine Trophic Index (China)

-Since the mid 1990s, MTI has signs of an increase
-This follows a steep decline during the 1980s and early 1990s



Although the marine food web may be recovering to some extent, it has not returned to its former condition



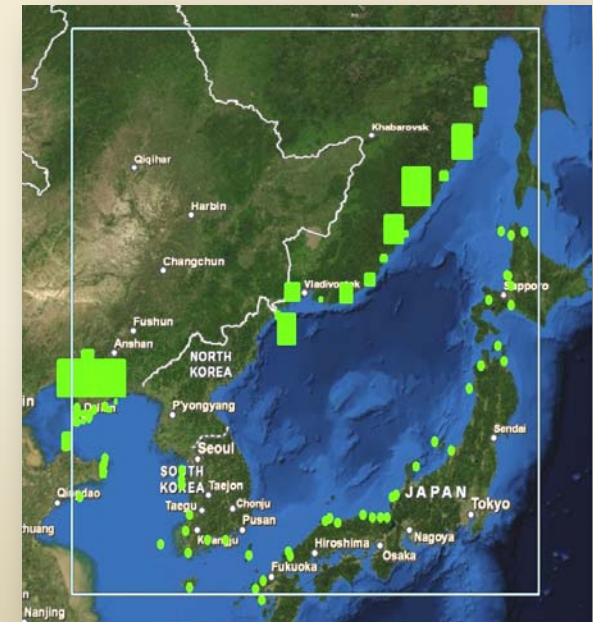
Marine Biodiversity Assessment: *Response*

1. MPAs

Number of protected areas and their area (hectares) in the NOWPAP region

Country	Number of PAs	Area (hectares) of PAs
China	20	1,367,206
Japan	23	436,235
Republic of Korea	22	357,333
Russia	14	1,956,770
Region	79	4,117,544

NOWPAP DINRAC (2010)





Marine Biodiversity Assessment: *Response*

2. Fisheries Agreements

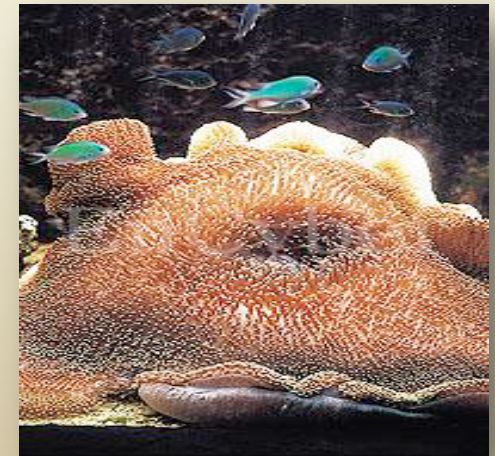
Multilateral fisheries agreements: **UNCLOS, UN Fish Stocks Agreement**

Bilateral fisheries agreements

Reducing fishing fleets and boat buy-back:
25% cut by China and Korea by 2020 (UNDP/GEF 2009)

Reducing nutrients loads into the Yellow Sea:
10% every five years since 2006 (UNDP/GEF 2009)

Establishing Protected Areas

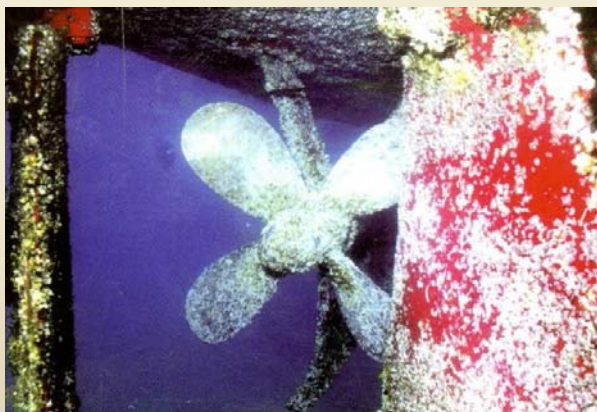




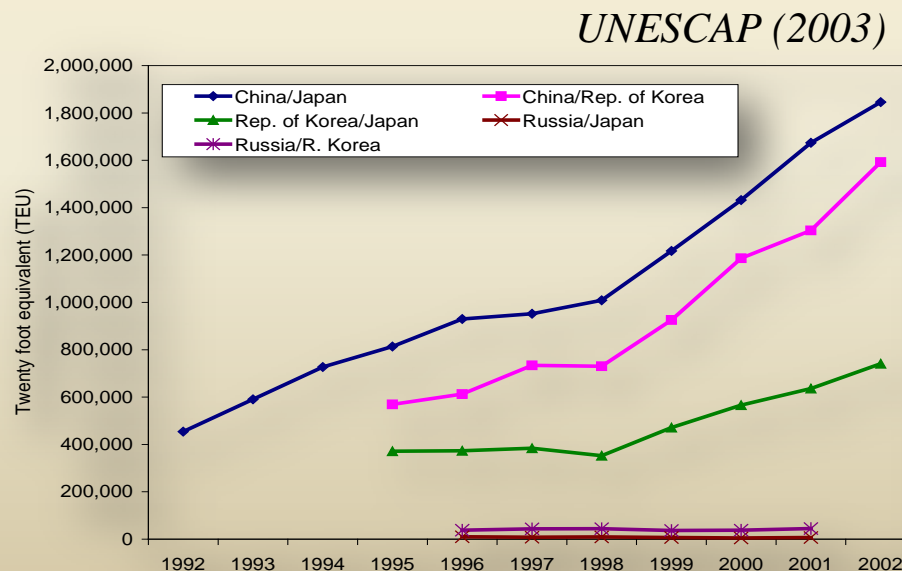
Marine Biodiversity Assessment: *Response*

3. Ballast Water Regulations

- *Significant increase in the volume of regional trade* between 1995 and 2002, driven mostly by trade with China
- As *shipping industry* has expanded, *ballast water* issue has received much attention in relation to *invasive species*
- *The Ballast Water Convention* is unfortunately not ratified yet



Amphibalanus improvisus,
Peter the Great Bay, Russia





APN - 1

Asia-Pacific Network for Global Change Research (APN)

“Impacts of global warming on coastal and marine ecosystems in the Northwest Pacific” lead by Dr. Sukgeun JUNG (JNU, ROK) : **granted USD 86,000 for two years**

- Will conduct comparative studies among NOWPAP countries
- Will evaluate regional differences in the responses of marine ecosystems to the changes



“will provide scientific basis to policy makers in NOWPAP member states”



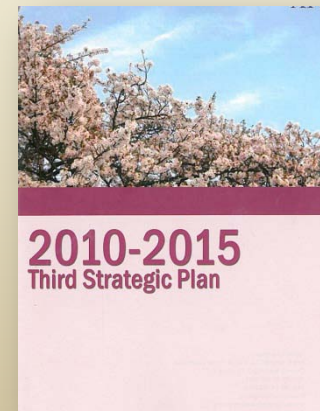


APN - 2

“Impacts of global warming on coastal and marine ecosystems in the NW Pacific”

Activities to be conducted by project team during 2011-2013:

1. *Gather* information available and develop national reports
2. *Compile* four national reports into a **regional report**
3. *Hold two workshops*
 - to introduce research findings and discuss future activities
 - to make policy makers understand better on the implication of climate change and impacts in the NW Pacific and raise their awareness





Conclusions and recommendations



- Overall message from assessments is: despite many efforts to conserve biodiversity, responses so far have not been adequate to address biodiversity loss or reduce the pressure on marine ecosystems
- According to global trends, *atmospheric nutrient deposition* and *species extinction* appear to be increasing, while *fish catch potential* is decreasing in the NOWPAP region
- NOWPAP member states should consider alternative paths:
 - More rational management of marine and coastal fisheries;
 - Reduction of stress (e.g. reducing coastal pollution);
 - Planning policies that will result in more resilient ecosystems;
 - Strengthening efforts on education of policy-makers and general public, based on scientific knowledge.
- NOWPAP will continue activities related to biodiversity assessments