

Climate Change  
Adaptation for  
the Future



# Organization and activities



## Background

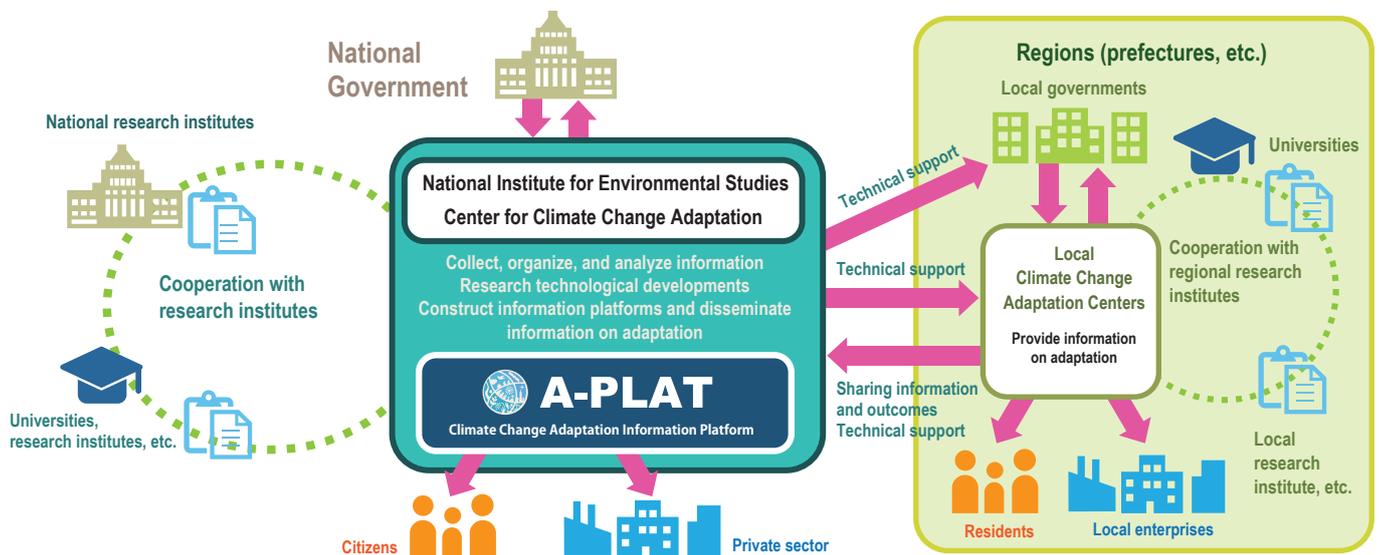
The Climate Change Adaptation Act (Law No. 50 of 2018) enforced in December 2018 specifies that the National Institute for Environmental Studies (NIES) shall be responsible to collect, organize, analyze, and provide information about the climate change impacts and adaptation as well as offer technical advice to local governments and Local Climate Change Adaptation Centers (LCCACs) to support efforts to cope with climate change.

The Center for Climate Change Adaptation (CCCA) was established on December 1, 2018 to conduct such services and research on climate change adaptation.



## Missions of CCCA

CCCA helps formulate plans to adapt to climate change and implement adaptation measures by central and local governments. Additionally, CCCA supports climate change adaptation efforts by major players, including business operators and individuals. These are achieved by promoting the collection, organization, and analysis of climate change information and disseminating research results on the impact and adaptation to climate change.



## Climate Change Adaptation Act

### 1. Comprehensively promote adaptation

The National Adaptation Plan aims to clarify the roles played by national and local public entities, businesses, and citizens to promote climate change adaptation.

The national government formulates a comprehensive climate change adaptation plan that promotes adaptation in diverse fields such as agriculture and disaster prevention as well as develop methods to understand and evaluate progress.

The impact of climate change is assessed approximately every five years and the National Adaptation Plan is revised accordingly.

Effective adaptation measures are promoted based on reliable and detailed information in the fields of agriculture, fisheries and forestry, water environment/water resources, natural ecosystems, natural disasters, health, industrial/economic activities, and the living standards of local residents.

### 2. Develop information platforms

The National Institute for Environmental Studies (NIES) is positioned at the core of information platforms on adaptation and is responsible for the following services:

- Collect, organize, analyze, and provide information on the impact and adaptation to climate change
- Provide technical advice to local governments and Local Climate Change Adaptation Centers (LCCACs)

### 3. Strengthen adaptation at the local level

Prefectures and municipalities must make efforts towards formulating local climate change adaptation plans.

Systems to collect and disseminate information on adaptation are ensured at the local level (Local Climate Change Adaptation Centers).

### 4. International expansion of adaptation

Promote international cooperation

Promote efforts and adaptation businesses, etc.



## Key Activities

### Development of information platforms

CCCA posts information on the climate change impacts and adaptation using the “Climate Change Adaptation Information Platform (A-PLAT)” . A-PLAT was launched as an information platform to promote efforts of local governments, businesses, etc.

In addition, to contribute to international cooperation in the area of climate change adaptation, CCCA constructs “Asia-Pacific Climate Change Adaptation Information Platform (AP-PLAT)” as a platform to support the formulation and implementation of adaptation plans in developing countries of the Asia-Pacific region.

### Support to local governments and LCCACs

The impact of climate change as well as the economic and social environments varies greatly by region. Therefore, regional efforts are extremely important to implement effective adaptation measures to mitigate damage caused by climate change.

By disseminating information via A-PLAT and collaborating with research institutions on climate change, NIES provides the following to support activities implemented by local governments and Local Climate Change Adaptation Centers (LCCACs):

- ① Technical advice to local governments and LCCACs to formulate and promote climate change adaptation plans
- ② Materials, information, and opinions at the request of Local Councils on climate change adaptation

### Climate Change Adaptation Research Programs

To scientifically support initiatives that promote climate change adaptation made by stakeholders, CCCA implements Climate Change Adaptation Research Programs on observations and monitoring of the climate change impact, assessment of climate change impacts, and climate change adaptation strategies.

### Outreach activities

The Center hosts symposiums, lectures, and workshops on climate change impacts and adaptation for businesses and individuals. Additionally, the Center provides pamphlets and other materials to support initiatives related to climate change adaptation.

#### Greeting from the Director of CCCA



**Dr. Hitoshi MUKAI**  
Director

In December 2018, the Center for Climate Change Adaptation (CCCA) was established in accordance with the enforcement of the “Climate Change Adaptation Act” . This Act was promulgated in June 2018 as a basic policy to comprehensively tackle the future impact of climate change by implementing adaptation measures to cope with climate change through complementary cooperation among local governments, businesses, and individuals, and the Japanese government. Under this law, the National Institute for Environmental Studies (NIES) is positioned as the “core information platform on impact and adaptation to climate change” , and will play a major role in Japan’ s adaptation measures.

One key role of CCCA is to develop information platforms on climate change impacts and adaptation. Another role is to provide local governments with the technical information and assistance to formulate adaptation plans. To these ends, we are implementing three distinct approaches. First, we are establishing an office to promote adaptation measures (Office for Climate Change Adaptation Promotion). Second, we collect, organize, analyze, and integrate diverse information in collaboration with organizations and universities, etc. involved in national and local government policy measures on the impact and adaptation to climate change. Third, we conduct research in the Climate Change Impacts Observation and Monitoring Research Section, Climate Change Impacts Assessment Research Section and Climate Change Adaptation Strategy Research Section. The aim of CCCA is to laterally expand useful information on adaptation and to help implement broad-based adaptation measures by accumulating local data through the exchange of information with LCCACs, which are agencies to serve as local agencies responsible for collecting data in their respective regions. In addition, we plan to analyze information to assist the Asia-Pacific region with implementing adaptation measures.

It is important to recognize that the impact of climate change is constantly changing. Thus, the latest research results and information from local areas must be shared in collaboration with respective research organizations. Consequently, it is imperative to provide every resident with information about the impact and adaptation to climate change as well as foster adaptation technologies and adaptation businesses. We strive to incorporate feedback from diverse stakeholders to improve CCCA.

# A-PLAT



A-PLAT provides information on climate change and scientific knowledge based on monitoring the impact of climate change, assessments of future impact, and adaptation strategies for a broad audience in an easy-to-use manner.

For example, A-PLAT provides data on future predictions in various fields such as meteorological information, the agricultural and human health sectors, databases on adaptation measures, interviews with local governments, and information related to scientific findings about climate change impacts and adaptation. We plan to expand the A-PLAT to include information about adaptation businesses and awareness-raising tools so that it not only supports activities for climate change adaptation initiated by local governments and LCCACs, but also contributes to the initiatives of various stakeholders such as businesses and individuals.



## Key Contents of A-PLAT

**Japanese** [adaptation-platform.nies.go.jp](http://adaptation-platform.nies.go.jp)  
**English** [adaptation-platform.nies.go.jp/en](http://adaptation-platform.nies.go.jp/en)



A-PLAT Website  
Japanese



A-PLAT Website  
English



What is climate change adaptation?



National government initiatives



Local government initiatives



Adaptation by businesses



National and prefectural information (WebGIS)



Adaptation by individuals

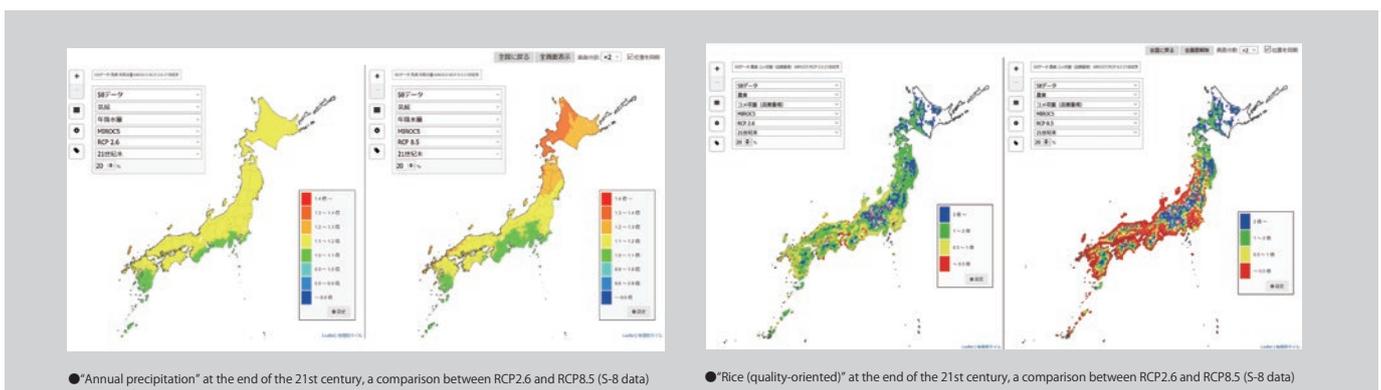
**Other contents**

- References/statistics
- Activity reports
- Adaptation measure database
- Adaptation businesses
- Climate risk management
- etc.



## National and prefectural information (WebGIS)

We provide information on climate predictions (mean annual temperature, extremely hot days above 30 ° C, and the frequency of hourly precipitation over 50 mm, etc.), agriculture (rice yields, etc.), water environments (chlorophyll-a concentration), natural ecosystems (potential beech habitats, etc.), natural disasters (sandy beach erosion rates, etc.), and human health (number of heatstroke patients transported to hospitals, etc.). The predicted impact of climate change on each sector at the prefectural level is denoted by different colors on a map.



# Adaptation measures database

We introduce examples of adaptation measures to combat the impact of climate change implemented by local governments, research organizations, businesses, etc. in each field and region in Japan and the world.



• The Adaptation Measures Database

### タイムライン (防災行動計画)

作成日	2018/09/11
地域名	全国、海外
分野	自然災害・沿岸域

タイムライン (防災行動計画) とは、災害の発生を前に、防災関係機関が連携して行う状況を予め想定し共有した上で、「いつ」、「誰が」、「何をするか」に着目して、の実施主体を時系列で整理した計画のことです。気候変動の影響により豪雨災害が今般化されています。国、地方公共団体、企業、住民等が連携して、予めタイムラインを構築し、災害時に連携した対応を行うことができます。

2012年、米国ニュージャージー州・ニューヨーク州に上陸したハリケーン・サンディ撃しました。ニューヨーク州知事は、「被害の発生を前提とした防災」として事前計画を策定していたため、タイムラインをもとに住民避難に対する対策を行ったことで、人的被害を最小限に抑えることができました。

### 高温にも強いブラッドオレンジ「タロッコ」の導入

作成日	2018/07/02
地域名	中国西部
分野	農業、森林・林業、水産業

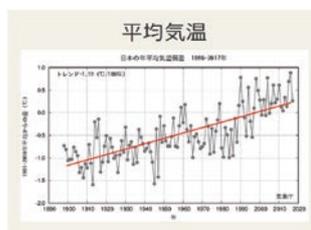
近年の地球温暖化はカンクツ農業に様々な影響を及ぼしています。春先の高温や秋先の干ばつが晩生結果を助長するとともに、秋期の高温・多雨がみかんの浮袋を多発させるなど、品質低下を招くようになっています。

愛知県南海市地域では、平均気温の上昇による温州みかんの高温障害の多発を受けて、夏場の高温にも強いブラッドオレンジの一つである「タロッコ」を導入しました。近年の温暖化の影響により、秋が長くなり春が早まるとともに、冬の-3℃以下の凍害が減り寒害が少なくなったことから、完全生産が可能となりました(図2)。2008年に栽培面積が7.9ha、生産量が2.1tでしたが、2013年には栽培面積が約23ha、生産量は14.0~15.0tに拡大し、市場で高い評価を受けています。

# Meteorological observation data

Meteorological observation data is graphed in cooperation with the Meteorological Agency of Japan to reveal long-term trends of weather changes at the prefectural level (temperature, precipitation, hot days, extremely hot days above 35 °C, etc.).

分類	北海道	青森県	岩手県	宮城県
秋田県	山形県	福島県	茨城県	栃木県
群馬県	埼玉県	千葉県	東京都	神奈川県
新潟県	富山県	石川県	福井県	岐阜県
長野県	山梨県	静岡県	愛知県	三重県
滋賀県	京都府	大阪府	兵庫県	奈良県
和歌山県	徳島県	香川県	岡山県	広島県
山口県	福岡県	佐賀県	熊本県	大分県
宮崎県	鹿児島県	沖縄県		



• Observation data in the local government's page / Data provided by the Japan Meteorological Agency

# Interviews on the topic of climate change adaptation

We post articles about the challenges encountered by local governments when formulating regional adaptation plans, their innovations to these challenges, and examples of characteristic adaptation measures implemented at the regional level.

### 数値目標を入れないという選択肢はなかった

—「適応」が必要な分野を6つに分類されたのはなぜでしょうか。優先順位についてもお聞かせください。

藤本さん：徳島県の現状からすると「国民生活・都市生活」を1分野で選別するのはあまりに小さすぎるということで、「産業経済」と「県土保全」に入れ込みましたが、基本的に国の適応計画の7分野はすべてカバーしているつもりです。優先順位というのは特に考えてなかったですね。県民にとってすべて大事なと思っていますので、本県は、全国平均を上回って高齢化が進んでいますし、急峻な地形や脆弱な地質、台風もよく来るといった特性がありますので、そういったリスクを低減できるようにしくみを各分野で整えました。



適応策 Vol.9 都市型水害に強いまちづくり  
～下水道整備の新たなステージへ～



科学的知見を県の施策へ！  
実装を支える研究機関と行政の連携体制に迫る

• From left: Adaptation Plan Vol. 1, Tokushima Prefecture; Adaptation Measures Vol. 11, Yokohama City; and Vol. 9, Saitama Prefecture

# Awareness-raising tools

We provide awareness-raising tools such as pamphlets explaining “adaptation” to the impact of climate change that can be utilized for awareness-raising activities initiated by local governments and other parties as well as for locally organized environmental events.



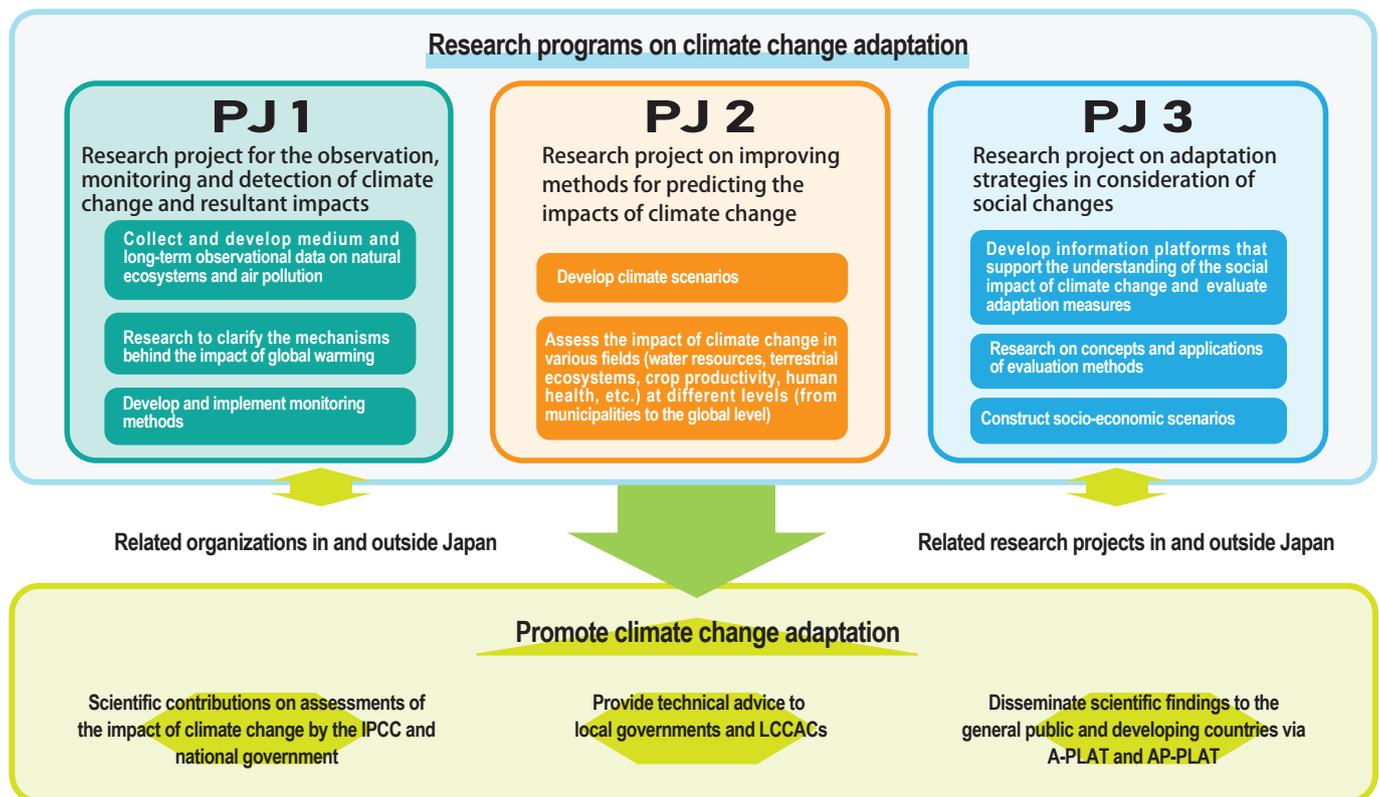
• Pamphlet example (PDF version can be downloaded from A-PLAT)

# Climate Change Adaptation research programs

To provide scientific support of our mission, we engage in research and technological development of observations and monitoring of the impact of climate change, improve methods to assess the impact of climate change, and promote climate change adaptation strategies. Outcomes of the climate change adaptation research program contribute to policy decisions by governments such as reports on the comprehensive assessment of climate change impacts, changes to the National Adaptation Plan, and initiatives by other key players, including local governments for climate change adaptation by publicizing the outcomes via A-PLAT and AP-PLAT.

These research programs address the following three issues:

- ① Research to construct climate change observation/monitoring systems, establish theories (mechanisms) and methods to analyze the relationship between long-term climate change trends and the resultant impacts, and identify the causes.
- ② Improve assessment methods of the impact of climate change in multiple areas, evaluate the impact of climate change utilizing the latest climate change and socio-economic scenarios, and construct systems to provide global and national climate change scenarios.
- ③ Organize knowledge regarding adaptation options and the impact of climate change in multiple sectors/fields, identify gaps and inhibitory factors that exist between adaptation plans and scientific knowledge, implement adaptation measures, and consider methods to formulate effective adaptation strategies.



## PJ 1 Research project for the observation, monitoring and detection of climate change and resultant impacts

We collect and organize long-term monitoring data in relation to natural ecosystems (terrestrial ecosystems, coastal-area/ enclosed-sea ecosystems, marine ecosystems, coastal ecosystems, and lake/watershed ecosystems), air pollution (ozone, particle matter (PM), etc.), and associated meteorological factors (e.g. air temperature, precipitation, wind velocity, humidity, etc.) to analyze the relationship between medium and long-term trends of climate change and its impacts.

We also strive to clarify the mechanisms behind the impact of climate change and develop effective monitoring methods to observe the impact of climate change.

The results of these activities are publicized on A-PLAT and AP-PLAT to disseminate to a broad public audience and promote the understanding of the impact of climate change.

## **PJ2** Research project on improving methods for predicting the impacts of climate change

We assess the impact of climate change in diverse fields (e.g. water resources, terrestrial ecosystems, crop yields, and human health) and at a variety of levels (from the global level to municipalities). We refer to the data and mechanisms behind the impact of climate change from PJ1 and work to establish advanced means to assess the impact of climate change in considering of the resulting socio-economic changes and a range of climatic factors, including temperature changes, changes in the amount of rainfall, sea-level rises, and ocean acidification.

Through these activities, we hope to contribute to adaptation methods such as improving the assessment of climate change impacts, identifying priority areas, enhancing the understanding of climate change risks among society by publicizing established climate scenarios, and disseminating impact assessment results via A-PLAT and AP-PLAT.

## **PJ3** Research project on adaptation strategies in consideration of social changes

This project investigates methods to accumulate and communicate scientific information related to adaptation, inhibitory factors on the perception of climate change risks, and implementation of adaptation measures. In addition, we collect and consolidate socio-economic scenarios currently under development. These are used to assess the impact of climate change and adaptation/mitigation measures by Japan and local governments.

We develop systems to quantitatively assess the effectiveness of adaptation measures that combine statistical analytical methods, including areal statistics based on statistical data, measured activity volume, and environmental data. We are also building a framework to assess the impact of climate change and adaptation measures based on Quality of Life (QOL) indices in consideration of the knock-on effect to local communities and the economy as well as conduct analysis using such systems and framework. Moreover, we clarify the effect that the impact of climate change occurring outside Japan will have on the production and consumption activities in Japan through international input-output analysis and applied general equilibrium model analysis, etc.

Through these activities, we hope to formulate effective adaptation strategies, promote the development of adaptation plans and implementation of adaptation measures by local governments, and communicate with stakeholders by publicizing obtained scientific knowledge and innovative systems on A-PLAT and AP-PLAT.

## **Framework of the Center for Climate Change Adaptation**



### **Office for Climate Change Adaptation Coordination**

Coordination of adaptation promotion measures along with cooperation with local governments and Local Centers for Climate Change Adaptation

### **Climate Change Impacts Observation and Monitoring Research Section**

#### **PJ1**

Research project for the observation, monitoring and detection of climate change and resultant impacts

### **Climate Change Impacts Assessment Research Section**

#### **PJ2**

Research project on improving methods for predicting the impacts of climate change

### **Climate Change Adaptation Strategy Research Section**

#### **PJ3**

Research project on adaptation strategies in consideration of social changes

# AP-PLAT



## Asia-Pacific Climate Change Adaptation Information Platform

In June 2019, we launched the AP-PLAT as an information platform to support the formulation of adaptation plans and adaptation measures in developing countries throughout the Asia-Pacific region based on scientific findings. We post outcomes of the bilateral projects implemented by Ministry of the Environment and other programs and information required to promote adaptation measures in Asia and the Pacific.

We also provide support to launch an original platform that collects climate risk information provided by countries in the Asia-Pacific region in collaboration with international efforts to share climate risk information.

### Three Key Activities under AP-PLAT

1. Develop datasets on the projection of climate change impacts in the region through bilateral cooperation & targeted studies
2. Develop supporting toolkits for officials and stakeholders engaged in adaptation planning
3. Build capacity on the climate change impact assessments & adaptation planning



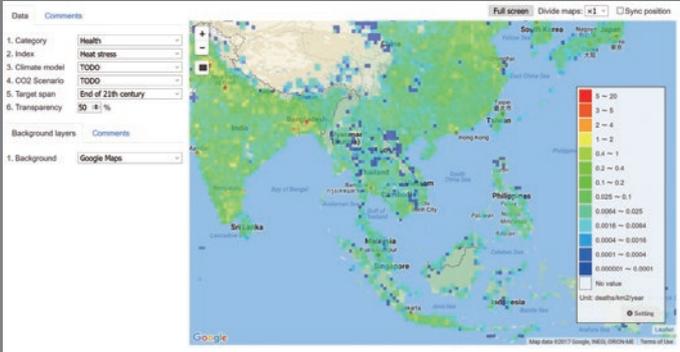
AP-PLAT



### Key Contents of AP-PLAT

#### Climate Impact Viewer

Research application to support adaptation planning in the Asia-Pacific region.



1. Category: Health  
2. Index: Heat stress  
3. Climate model: T000  
4. CO2 Scenario: T000  
5. Target year: End of 21st century  
6. Transparency: 30 - 51%

Background layers: 1. Background: Google Maps

#### Good practices, experiences and lessons learned from bilateral cooperation



Flood extent of different land-use scenarios under event-based precipitation in Silang-Sta. Rosa sub-watershed, Philippines

Coastal hazard maps of Suva, Fiji using satellite-based bathymetry, digital elevation model and wave-surge-current model

#### Integrating useful resources from our partners - Examples of collaboration with ADB-



Regional Climate Consortium for Asia and the Pacific



Guidance for Climate Information Development



Case Studies

1. Information developed under ADB's technical assistance project "Regional Climate Projections Consortium and Data Facility in Asia and the Pacific"
2. Climate risk and vulnerability assessments conducted within the context of ADB investment projects

AP-PLAT Website



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CCA Website

2019.8.31



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