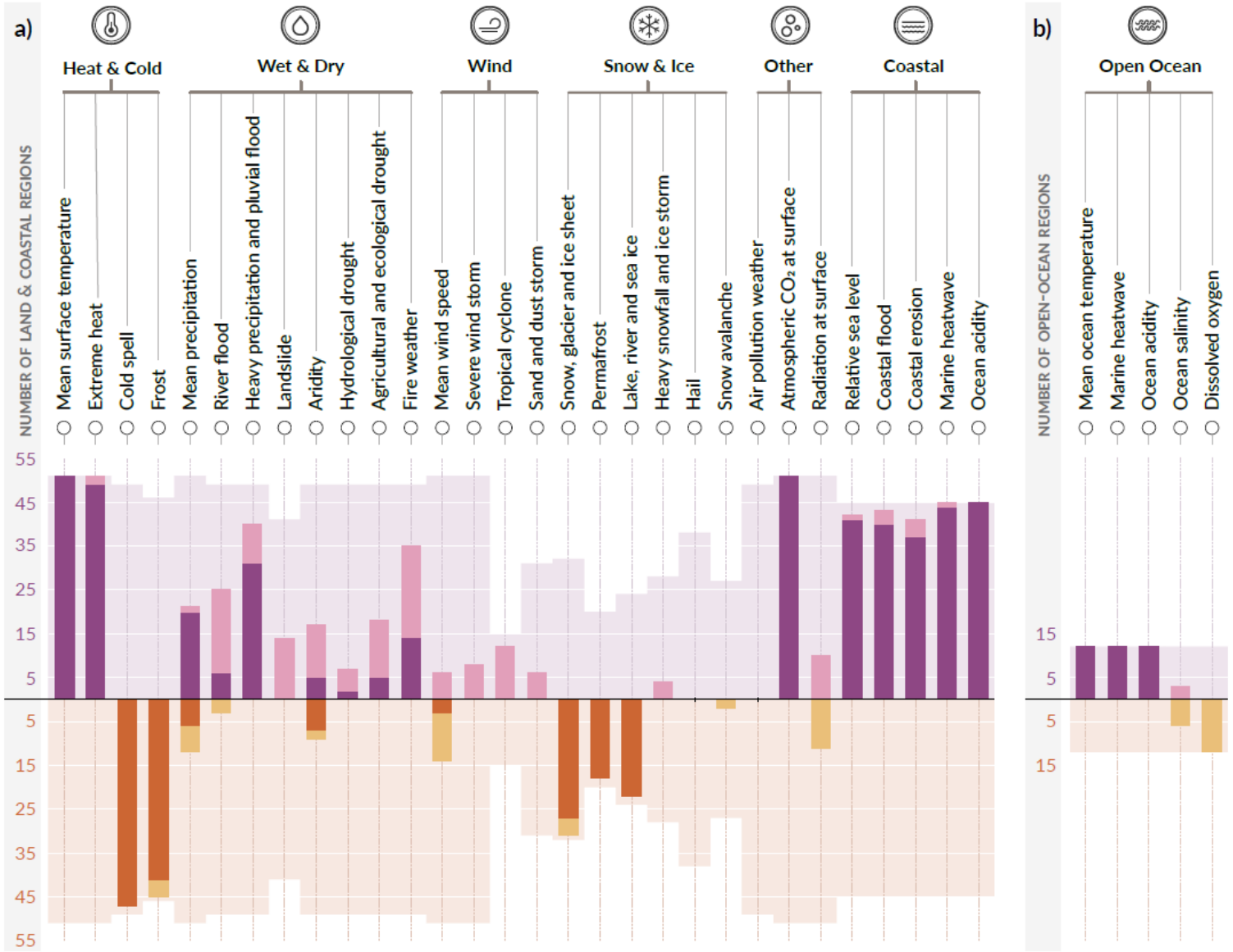
Climate Information for Regional Sustainable Development

National Climate Centre
China Meteorological Administration

2021年11月3日



BAR CHART LEGEND

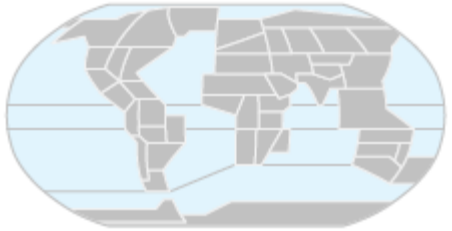
- Regions with *high confidence* increase
- Regions with *medium confidence* increase
- Regions with *high confidence* decrease
- Regions with *medium confidence* decrease

LIGHTER-SHADED 'ENVELOPE' LEGEND

The height of the lighter shaded 'envelope' behind each bar represents the maximum number of regions for which each CID is relevant. The envelope is symmetrical about the x-axis showing the maximum possible number of relevant regions for CID increase (upper part) or decrease (lower part).

ASSESSED FUTURE CHANGES

Changes refer to a 20–30 year period centred around 2050 and/or consistent with 2°C global warming compared to a similar period within 1960-2014 or 1850-1900.

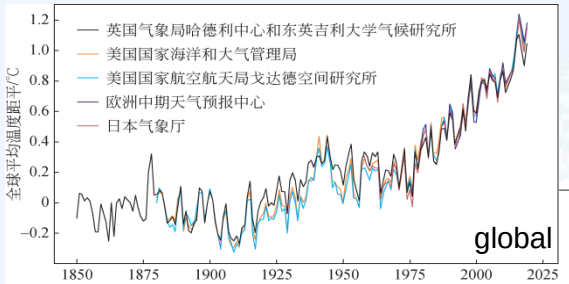


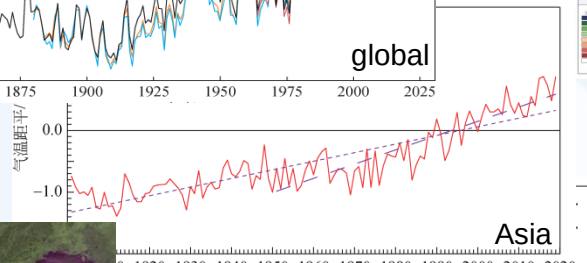
- All regions are projected to experience changes in at least 5 CIDs.
- Almost all (96%) are projected to experience changes in at least 10 CIDs and half in at least 15 CIDs.
- For many CIDs there is wide geographical variation in where they change and so each region are projected to experience a specific set of CID changes.

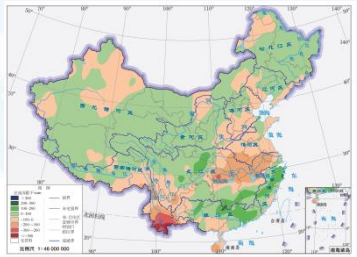
Number of land & coastal regions (a) and **open-ocean regions** (b) where each **climatic impact-driver** (CID) is projected to **increase** or **decrease** with ***high*** *confidence* (dark shade) or ***medium*** *confidence* (light shade)

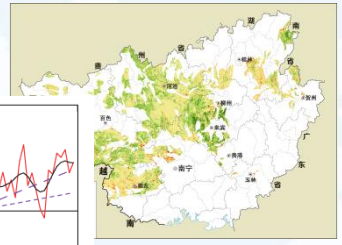
IPCC WGI AR6, 2021

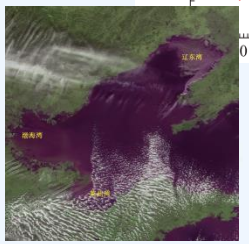
Efforts from observations to tackling climate change

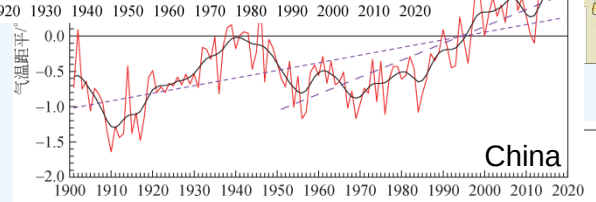


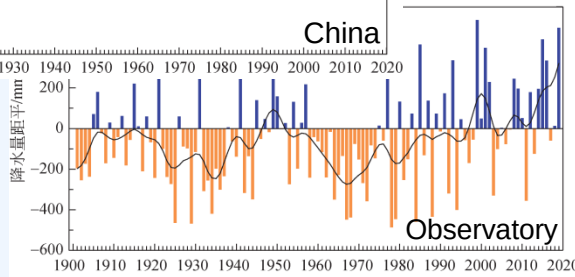


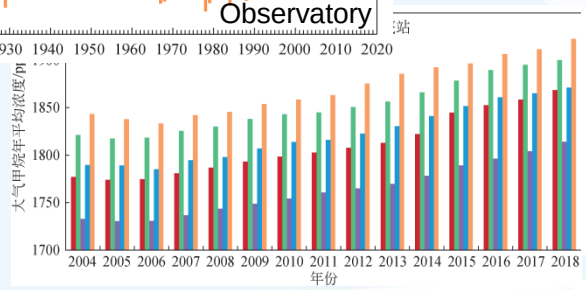


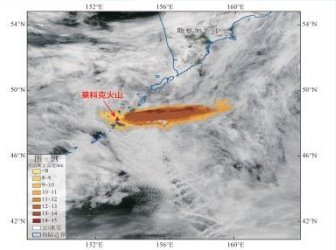


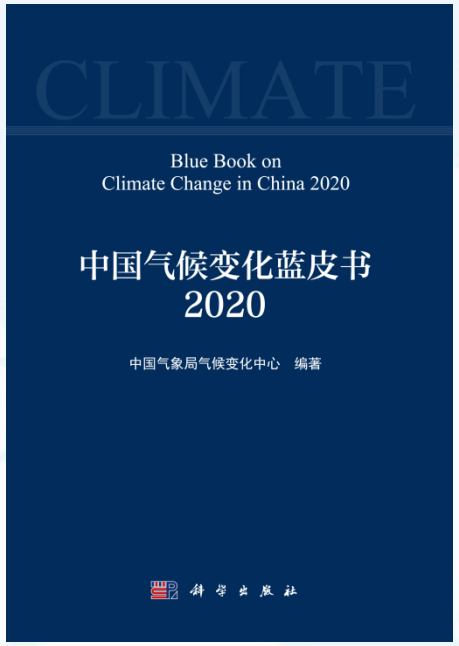




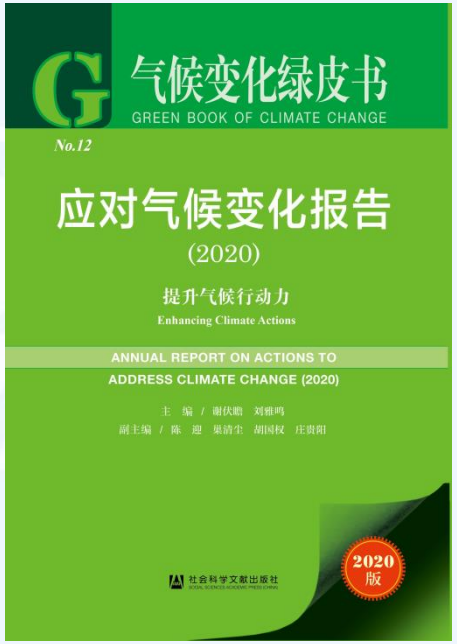








Blue book on Climate Change Monitoring, since 2009



Green Book on Tackling Climate Change, since 2009

- In-situ obs, FY sat., reanalysis
- Centennial to Half-centennial series
- Global to regional scales: global, Asia, China, sub-regions
- Atmosphere, hydrosphere, cryosphere, terrestrial biosphere, natural and human drivers

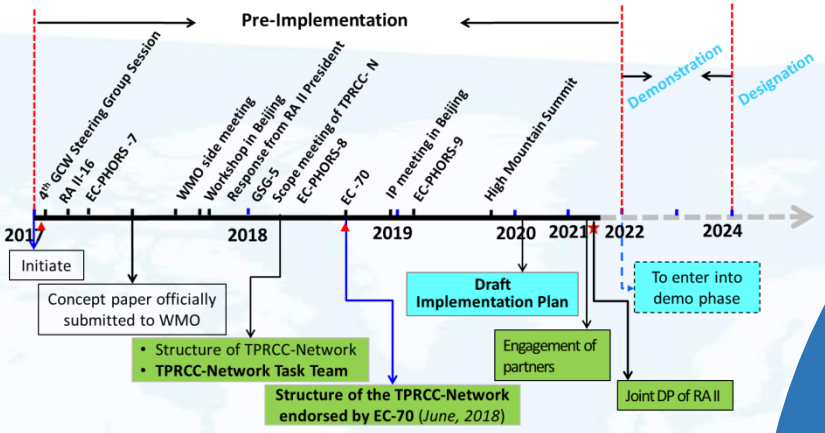
International progress and domestic actions on climate change, relevant research and review

- Enhancing Climate Actions
- Climate Risk Prevention
- Climate Finance and Low Carbon Development

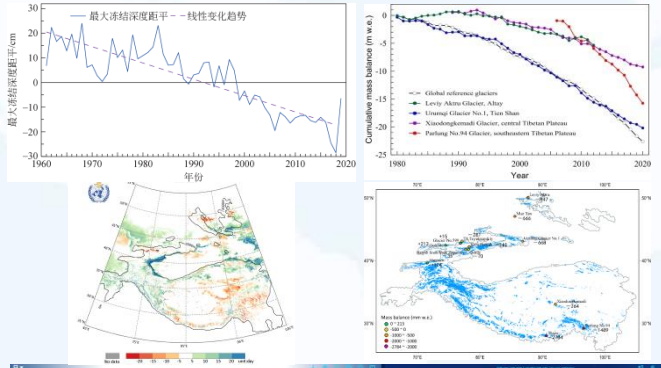
Capacity building for climate change in vulnerable region

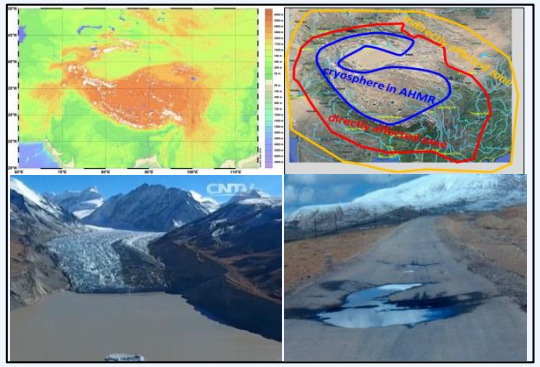
CMA & WMO signed *LOI*

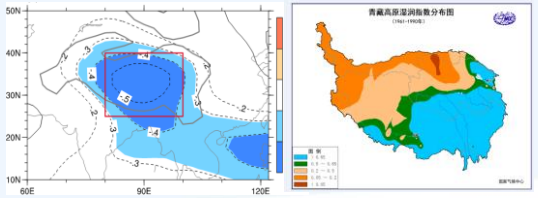
- push forward meteorological support for Belt and Road construction
- conduct work in disaster risk reduction, climate services, integrated observation, research and capacity development

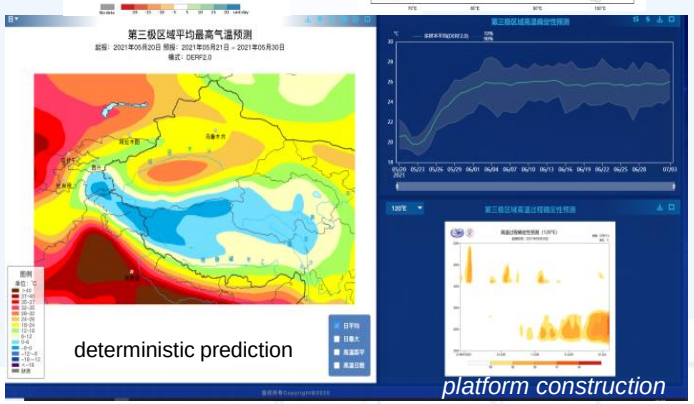


Roadmap of WMO TPRCC-Network









…high-mountain regions, where the cryosphere is a prominent feature.

IPCC SROCC, 2019

Cryospheric Ecosystems

- Monitoring of structure and pattern
- Cryospheric biogeochemical cycle, e.g. monitoring and prediction of carbon cycle changes

Cryospheric Hydrology

- Melt-water runoff monitoring of cryosphere components
- Simulation of physical processes ablation and monitoring of responses to climate change

Cryospheric Science of Disaster

- Monitoring, prediction and assessment of climatic factors for cryospheric disasters
- Climate-based cryosphere disaster risk assessment

Centered on cryosphere

Atmosphere

- Monitoring, verification, prediction, evaluation
- detection and attribution

Cryospheric Climatology

- Fine monitoring and quantitative evaluation of cryosphere variables
- Monitoring of the response of cryosphere formation to climate change
- Future projections of cryospheric components

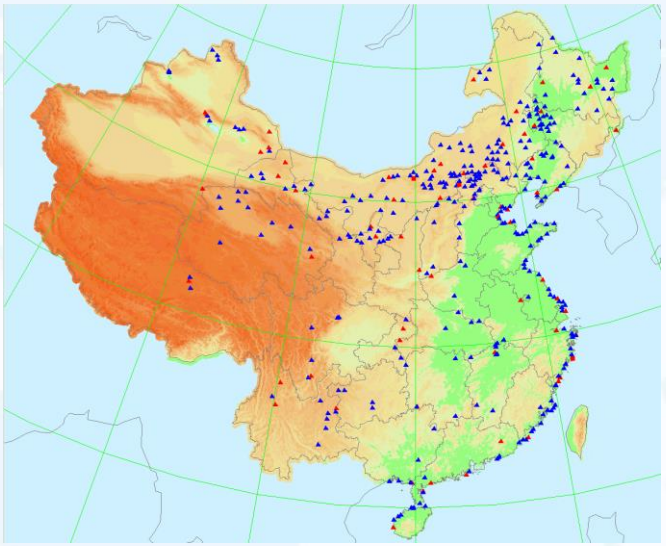
Regional Climate Service to meet challenges in High Mountain Asia

Green energy supports low-carbon development

Multi-sources observations with high quality
- FY Satellites
- 2400+ surface weather stations
- 169 sounding stations

Assimilation System
- Optimize the parameterization scheme of physical process
- More vertical layers for boundary layer

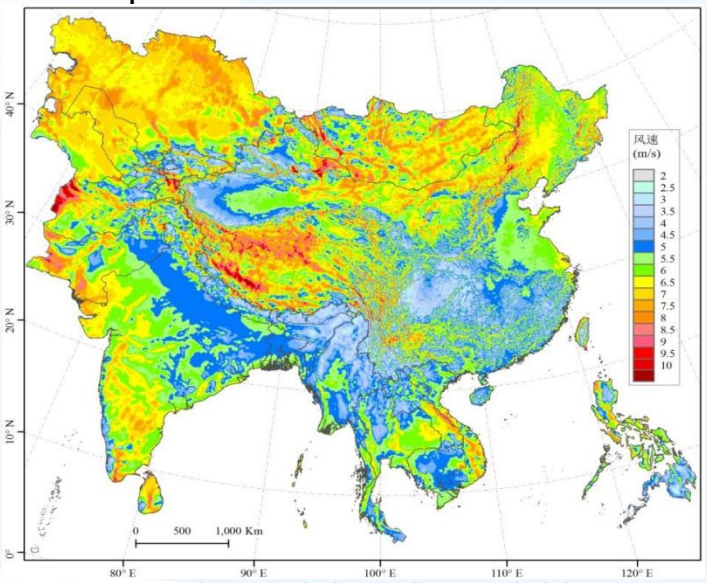
Verification
- independent sample from ~400 wind masts and 8000+ auto stations
- Inter-comparison with MERRA-2 and ERA5



wind energy resource specialized observation network, CMA

BCC_3km Wind Resource data set
- At 70m and 100m grids with wind masts, relative error of annual mean wind speed at ~80% grids is less than 10% and is less than 5% at ~50% grids.
- At 50m grids, the error is less than 15%, which is 10% lower than MERRA2

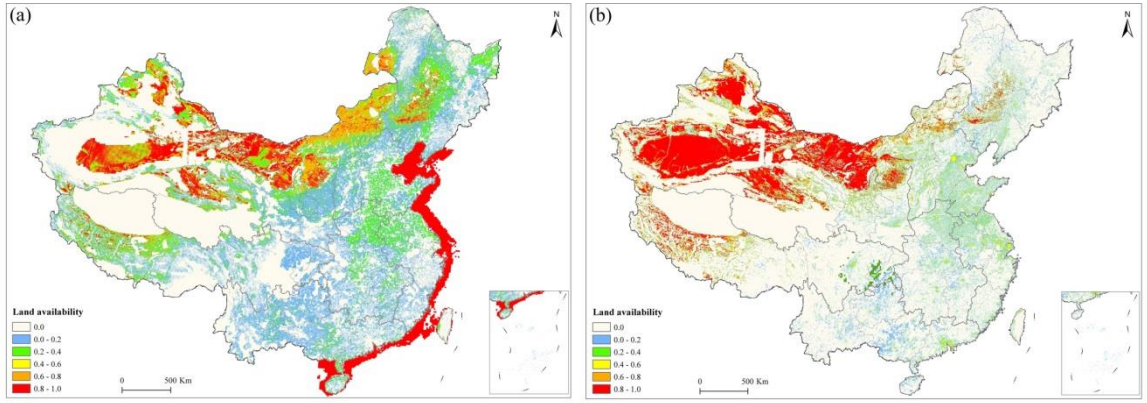
Refined wind resource map
- CFD driven by BCC_3km data
- realize micro-site selection and optimization design of wind farm without in-situ observation towers
- support development of decentralized wind power



Annual mean wind speed at 80m height

limiting factors: technique, policy, and economy

Assessment of China's wind and solar technical capacity



Liu et al., 2020

More on poster from CMA, China