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Media Pack
The CWR Survival Guides to Avoiding Atlantis

Press release

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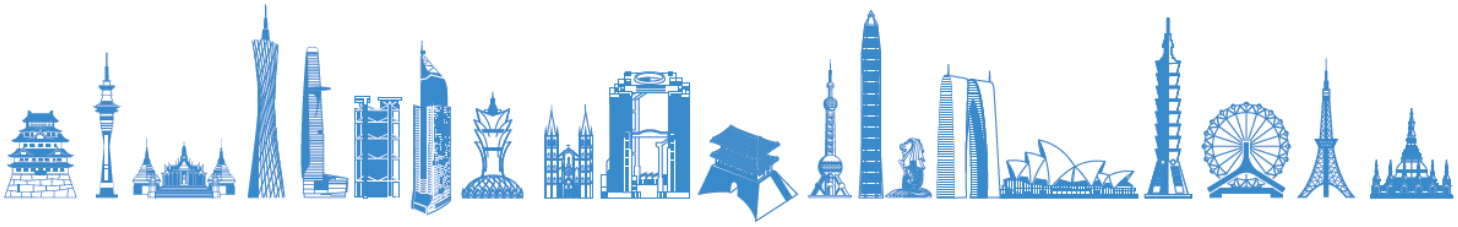
Overview & Access 5 reports

Infographics & quick stats:

- **What's at stake**
  At-a-glance impacts for the APAC region from coastal threats for 20 APAC capitals & key economic hubs.
- **CWR APACCT 20 Index city rankings**
  Index rankings are for two scenarios – one at 1.5°C that we will lock-in and another at 4°C that we must try to avoid. See how cities rank in terms of vulnerability to sea level rise, subsidence and storm surge risks plus which cities are ahead and which lag in adaptation efforts to protect their residents and assets.
- **Triggers of systemic shocks in finance**
  Concentrated and clustered risks from GDP, trade and markets to bank loans that could trigger systemic shocks and financial collapse.
- **Need-to-know to threats to survive**
  Shocking stats on fast & furious warming, ice melt, rising seas, storm tides and sinking cities.

Recommended next steps



WATER MATTERS
DECISIONS TODAY FOR WATER TOMORROW

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Press Release

NEW 5-REPORT SERIES: The CWR Survival Guides to Avoiding Atlantis

A series of five reports on benchmarking coastal capital threats in Asia Pacific (APAC) by CWR (China Water Risk)

Hong Kong, 23rd November 2020 – CWR releases a series of **"survival guides"** to avoid Atlantis in its **Coastal Capital Threat Series,** which benchmarks risks for 20 coastal capitals and economic hubs in APAC from Tokyo to Sydney. According to CWR, urban real estate equivalent to 59 Singapores will be underwater without serious adaptation measures if we continue with business-as-usual. And that's just for 20 coastal cities.

Seas are rising faster than we think so CWR has curated a "survival guide" series of five reports to help avoid this dire future. The five reports include an overview of the latest science on rising seas; a ground-breaking CWR APACCT 20 Index to benchmark risks; physical threats levels of 20 APAC cities; what governments are or are not doing to protect from existential threats; analyses of sovereign and clustered financial risks from GDP and trade to bank loans; as well as next steps and to-do lists for multiple stakeholders to waterproof APAC.

We are running out of time to avoid Atlantis. We will likely hit 1.5°C of warming by 2030. Reaching this 70 years earlier than the intended Paris Agreement target date of 2100 means we will feel the impact of rising seas sooner. As it is, we are already 1.1°C warmer than the pre-industrial period.

Instead of 1m, ice experts now say that sea level rise as high as 3m is plausible by 2100. Unfortunately, as many cities are sinking and face typhoons across APAC, coastal threats will be felt sooner. According to CWR, ASEAN cities like Bangkok and Jakarta could be permanently submerged by 1.94m and 2.37m respectively by 2050. Elsewhere in typhoon prone North Asia, both Hong Kong and Tokyo could see storm tides of 5.5m+ today if typhoons arrive at high tide.

Costs from storms are set to balloon – just seven typhoons between 2017 and 2019 cost APAC US$60bn, yet CWR estimates that storm tides plus rising seas could reach 10m+ by 2100 in their worst-case scenarios for Hong Kong. According to CWR's reports, a person standing in front of the AIA, Hong Kong Club, HSBC, Mandarin Oriental or Standard Chartered buildings in the city's Central financial district will be hit by waves as high as 5.69m.

"*If we are not prepared, APAC's coastal capitals will become the new Atlantis. Impacts are severe as they are clustered – around 3m of SLR will paralyse trade-reliant APAC economies and wipe out millions of homes and jobs*", warned Debra Tan, the Head of CWR. *"Just 20 coastal cities in our CWR APACCT 20 Index drive around a quarter of global sea and air cargo volumes; yet at 1.5°C we'd lock-in the loss of 20 ports and 12 airports that serve these cities. This clearly puts the recently inked RCEP trade deal at risk"* she adds.

Managing coastal threats is integral to avoiding Atlantis. As part of its survival guide, CWR worked with the financial sector to develop the CWR APACCT 20 Index for 20 coastal capitals and economic hubs. Over 100 finance professionals from chairs/directors of bank boards to credit/equity research analysts plus financial industry associations, asset owners and financial regulators helped build this inaugural index which not only benchmarks physical coastal threats but also government adaptation action to protect cities as it can reduce risks.

The risk snapshot CWR provides is sobering. CWR's index shows that rising seas will cause 28 million people to lose their homes, urban real estate equivalent to 22 Singapores will be underwater. And this is under the best-case scenario of 1.5°C, which we will lock-in in 10 years' time. Inaction means our current climate path of 3°C-5°C will send us headlong into a dire future – swathes of APAC will be underwater – the 4°C CWR APACCT 20 Index shows that over 100mn people will lose their homes, urban real estate equivalent to 59 Singapores will be underwater plus all 23 ports and 23 out of 25 airports will be permanently submerged without serious adaptation measures. And that's just for 20 coastal cities.

"These sea level rise impacts were supposed to hit us a few hundred years in the future but now we may feel the locked-in impacts of 1.5°C as early as 2100, and for 4°C by 2200." said Tan. Latest research released this year indicates that Greenland and Antarctica are losing ice 6x faster than they were in the 1990s plus our oceans have warmed at an alarming rate, equivalent to dropping 5 Hiroshima bombs per second into the ocean for the last 25 years. Both accelerate rising seas. Given this grim future, *"APAC must move to implement no-regret adaptation for locked-in impacts at 1.5°C plus commit and fast-track carbon neutrality to avoid 4°C"* urged Tan.

Yet, CWR's index rankings reveal unexpected behaviour – not all governments are taking action to protect their cities despite high exposure to coastal threats. At the bottom, at No.20, is Taipei in the 1.5°C CWR APACCT 20 Index; and Macao in the 4°C CWR APACCT 20 Index. Surprisingly, other cities with lacklustre adaptation despite high vulnerability are Hong Kong and Tokyo. At the top, Singapore leads the pack: No.1 in both 1.5°C and 4°C CWR APACCT 20 Index rankings – it's spending over SGD100bn on adaptation including raising critical infrastructure by 5m. Shanghai, Shenzhen and Guangzhou, are all vulnerable but their adaptation efforts including reinforcing and building sea walls see their rankings materially improve. Jakarta's extreme plans of moving its administrative capital plus building sea walls and polders see it to the Top 5.

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CWR's analysis also reveals that not all cities from the same country are taking the same amount of action despite significant GDP at risk. If this continues, the region will be in for a hard landing. As Dharisha Mirando, lead author of the series stated *"The high concentration of financial risks is concerning. In APAC, people, assets and GDP are clustered in coastal capitals and key cities – the 20 APAC cities in our index generate US$5.7trn of GDP per annum, this is greater than the combined GDP of Germany and Canada."*

Mirando further cautioned that *"These cities drive their national/territorial GDP – around 20% plus more for Tokyo, Seoul, Sydney, Auckland, Bangkok, Manila and Taipei to 100% for Hong Kong, Singapore and Macao. Such levels have implications for sovereign credit risk. Our analysis has led us to put Japan, Hong Kong, Macao and Taiwan on our watchlist. These governments should step up action to protect their cities, especially since they can afford to."*

Risks expand beyond GDP and trade. CWR's reports reveal bank loan books, markets and pension funds are also clustered and exposed to coastal threats. Central banks and financial regulators are taking action to address climate risks and credit rating agencies have also started to warn of coastal threat implications for sovereigns. But chronic risk assessments and inclusion of coastal threats in valuations have yet to manifest. This missing chunk of chronic risks results in an incomplete APAC risk snapshot that perpetuates a vicious cycle – capital continues to be deployed to vulnerable locations while ongoing investments in carbon intensive industries further exacerbates vulnerability.

Banks are acting with recent carbon neutrality pledges but CWR says they are not acting fast enough. *"The longer we ignore chronic tail risks, the worse it becomes. Sooner or later, we must bite the bullet and discount terminal values - the permanent overhang from rising seas effectively turns the valuations of all vulnerable assets from "freehold" into "leasehold". This is finance 101; not natural capital accounting. Don't just prioritise carbon transition risks – banks must start to assess and spread physical coastal threats plus ensure capital adequacy*" said ex-banker Tan.

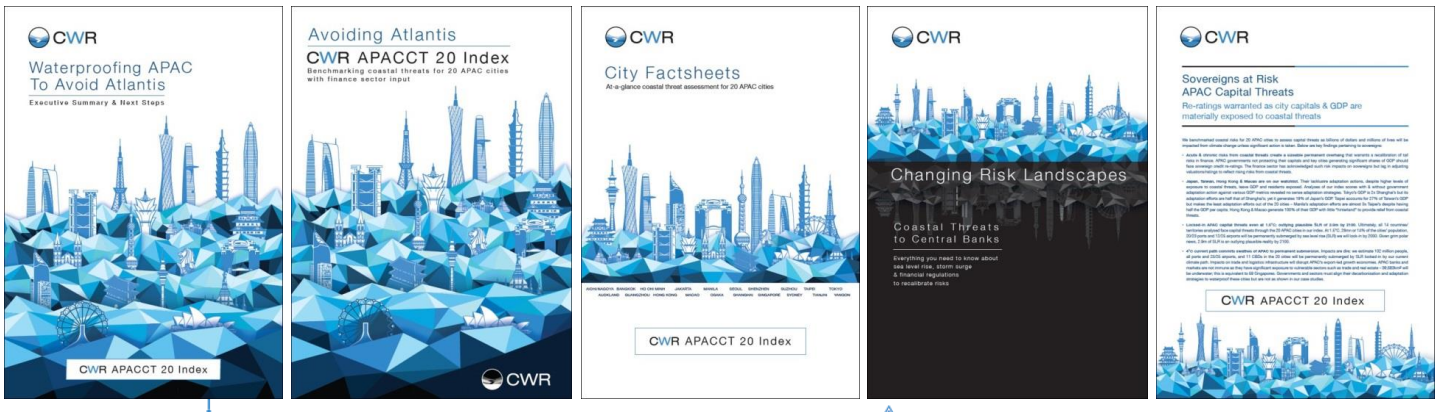
Indeed, the statistics in CWR's reports are compelling as they are shocking; a much needed urgent wake up call to action. With so much at stake, CWR hopes that all stakeholders use their 3-step survival guide - Step 1: Get on top of existential threats; Step 2: Assess exposure; and Step 3: Take action to waterproof APAC with tailored to-do lists for different stakeholders. Sounds simple right? As Tan summarised *"It's time for finance and governments to make sensible plans to ensure that APAC is ready and can survive capital threats and systemic shocks ahead. Together we must waterproof APAC to avoid Atlantis. The alternative is unthinkable".*

For more information, please contact: Dharisha Mirando
Email: dmi@chinawaterrisk.org

CWR's Survival Guide Series Link:
http://www.chinawaterrisk.org/notices/new-cwr-report-cwr-coastal-capital-threat-series

CWR APACCT 20 Index

CWR Survival Guide to Avoiding Atlantis



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About CWR

CWR (China Water Risk) is a non-profit think tank that aims to create a world where water and climate risks are embedded in business & finance. Since its launch in 2011, it has worked from its Hong Kong base to engage with global business and investment communities in understanding and managing various types of water risks in China and across Asia. CWR's collaborative reports with financial institutions, IGOs, scientists as well as government related bodies have been considered ground-breaking and instrumental in understanding Asia's water challenges. They have help inform better decision-making today for a water secure tomorrow. Join the conversation at www.chinawaterrisk.org

CWR Core Funders:

About ADMCF

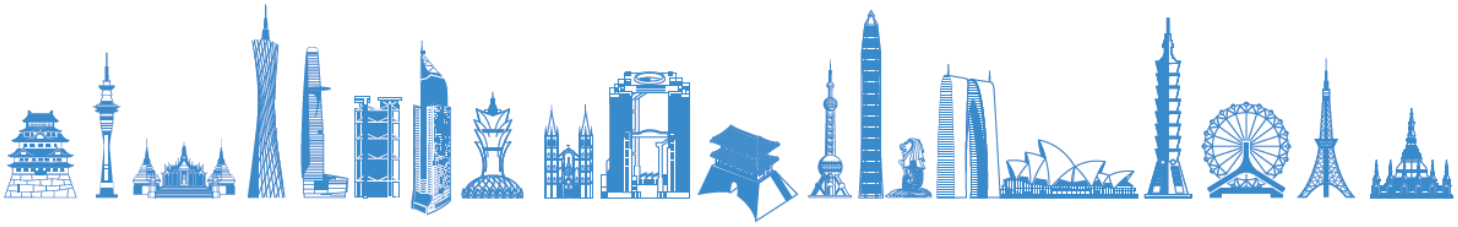
The ADM Capital Foundation (ADMCF) has incubated and sponsored CWR from the start. ADMCF supports CWR through core grants and the provision of office space. ADMCF is an impact driven foundation focused on making change in Asia across five key areas: marine ecology, water security, air quality, wildlife trade and forestry conservation finance. www.admcf.org

About RS Group

RS Group has been a core funder of CWR since 2013, allowing CWR the flexibility to drive funding to areas that can catalyse maximum impact. RS Group is a family office that focuses on sustainability. It believes that it in new, collaborative approaches to investment, business and philanthropy are needed if we are going to build a global community where social progress and economic development occur in harmony with nature. www.rsgroup.asia

About RBF

The Rockefellers Brothers Fund (RBF) has funded CWR since 2013. Originally funds were project focused but as CWR grew, RBF support evolved into core grants allowing CWR the flexibility to drive funding to areas that can catalyse maximum impact given the fast-moving environmental landscape in China. The Rockefeller Brothers Fund advances social change that contributes to a more just, sustainable, and peaceful world. www.rbf.org



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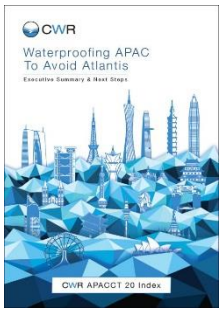
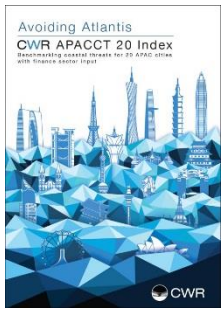
NEW 5-REPORT SERIES: CWR Survival Guide to Avoiding Atlantis

A series of five reports on benchmarking coastal capital threats in Asia Pacific (APAC) by CWR (China Water Risk)

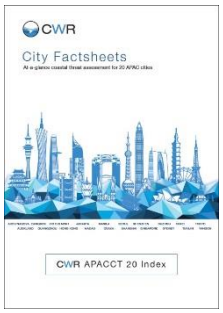
1. **Waterproofing APAC To Avoid Atlantis – Executive Summary & Next Steps.** This report is CWR's survival guide to avoiding Atlantis. It is the executive summary of the entire series of reports and is full of infographics plus need-to-know facts about the new risk landscape. It also guides you through 3-steps to waterproof APAC including next steps and to-do lists for asset owners, asset managers and banks; central banks and regulators; and governments. So if you don't have time to read the rest of the series, we recommend you read this one.



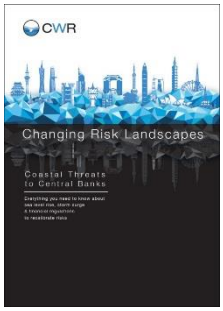
2. **Avoiding Atlantis: CWR APACCT 20 Index – Benchmarking coastal threats for 20 APAC cities with finance sector input.** This report covers the development of the CWR APACCT 20 Index (CWR APAC Coastal Threat Index for 20 cities) including the benchmarking methodology and finance sector feedback which shaped the parameters of the index, its indicators plus weightings. The index reflects impacts on land area, population, key infrastructure – stacked locked-in sea level rise (SLR) risks for 1.5˚C, 2˚C, 3˚C & 4˚C are assessed for each indicator; subsidence + storm surge + government action also included. To gauge relative risk across APAC, see which cities are ahead and which cities are behind in surviving our rising seas and access the index.



3. **CWR APACCT 20 Index City Factsheets – At-a-glance coastal threat assessment for 20 APAC cities.** This is a collection of factsheets for each of the cities in the CWR APACCT 20 Index illustrating at-a-glance exposure for various climate scenarios. Cities included are Aichi/Nagoya, Auckland, Bangkok, Guangzhou, Ho Chi Minh, Hong Kong, Jakarta, Macao, Manila, Osaka, Seoul, Shanghai, Shenzhen, Singapore, Suzhou, Sydney, Taipei, Tianjin, Tokyo & Yangon. Use factsheets to help gauge absolute risks – see a risk snapshot for each city now.



4. **Changing Risk Landscapes: Coastal Threats To Central Banks – Everything you need to know about sea level rise, storm surge & financial regulations to recalibrate risks.** Central Banks around the world have formed a 68+ member strong coalition to prepare for systemic risks triggered by climate threats. Recent grim polar news means multi-metre SLR is more imminent than we think yet we have not factored in such chronic risks. This report thus provides an overview of the latest science-based research on SLR & storm surge and their tail risk implications for finance. A summary of the evolving financial landscape plus how-to-build scenarios guide to assess hotspots are provided. So stay ahead of the curve and get on top of this new risk landscape.



5. **Sovereigns at Risk – APAC Capital Threats – Re-ratings warranted as city capitals & GDP are materially exposed to coastal threats**. Acute & chronic risks from coastal threats create a sizeable permanent overhang that warrants a recalibration of risks across finance. APAC governments that are not protecting their cities and revenue only compound the physical threats ahead. In this report, we analyse clustered risks from GDP to trade and markets plus run through the implications for sovereign credit ratings of the 14 APAC countries/territories. See why we have put Japan, Taiwan, Hong Kong and Macao on our watchlist.

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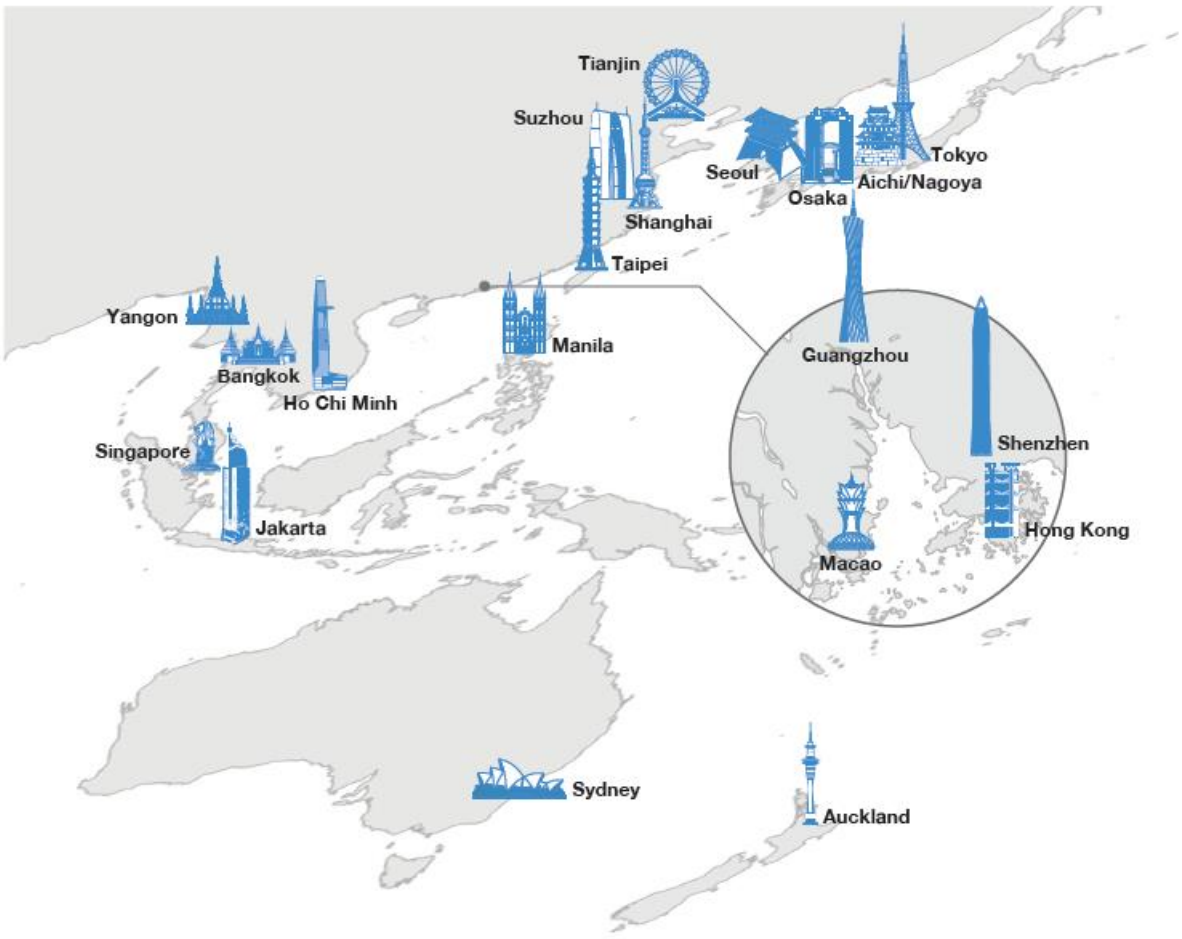
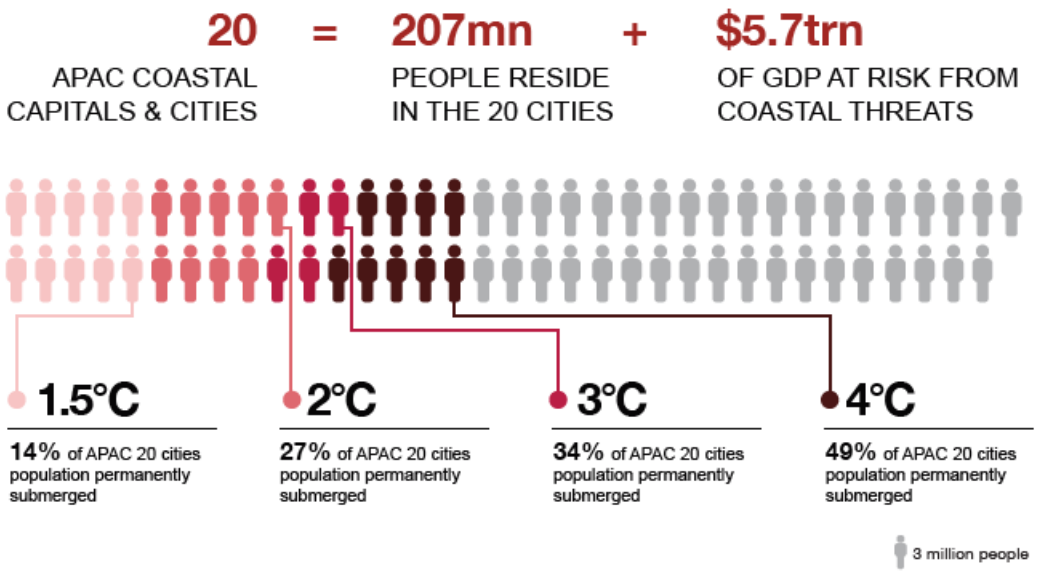
Infographics & quick stats: What's at stake

The 20 cities of the CWR APACCT 20 Index...



The CWR APACCT 20 Index: What's at stake...



Source: CWR APACCT 20 Index; CWR report "Sovereigns at Risk: APAC Capital threats", 2020

Note: The impacts on population are based on estimates for 2020 and do not include any further population growth and increases/decreases in urbanisation in the future. For more details, please see "CWR APACCT 20 Index: benchmarking chronic tail risks & adaptation actions to avoid Atlantis" in Section 3.

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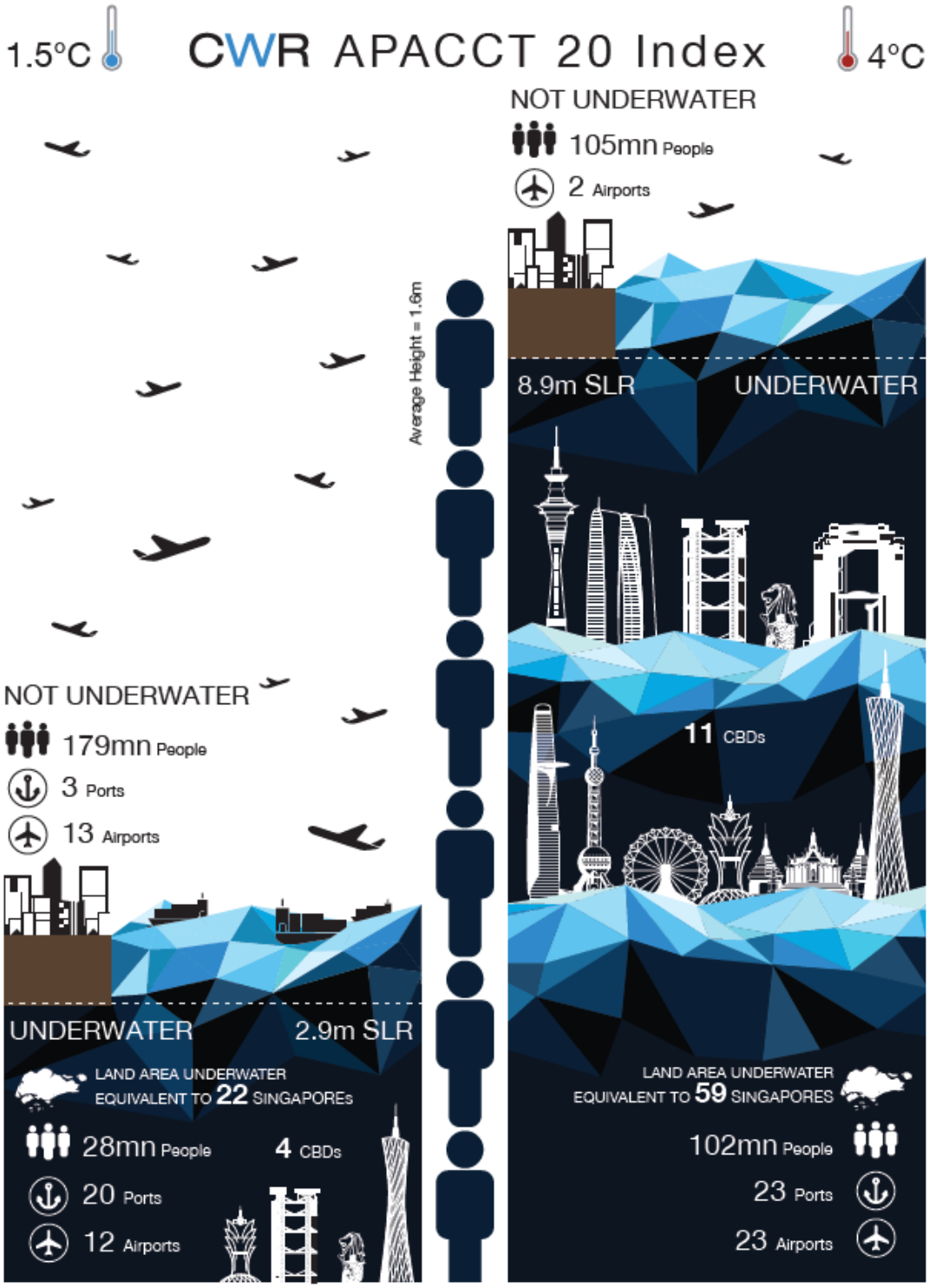
Infographics & quick stats: What's at stake

Submerged! Sea level rise we lock-in at 1.5°C vs 4°C



Source: CWR report "Avoiding Atlantis : The CWR APACCT 20 Index", 2020 *Infographic © China Water Risk 2020, all rights reserved*

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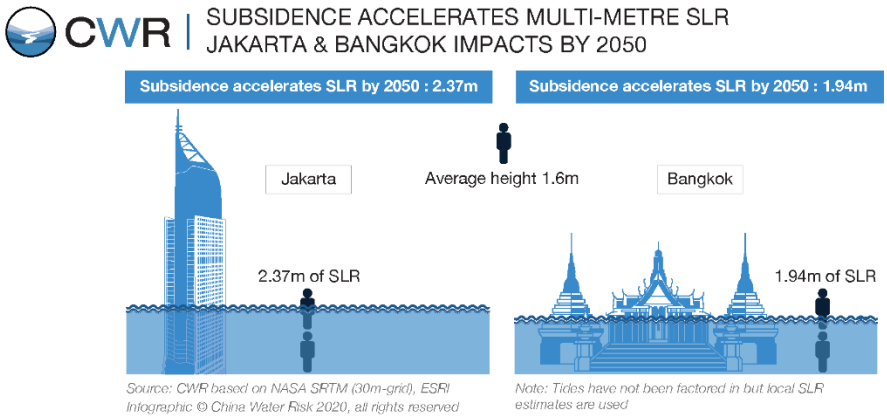
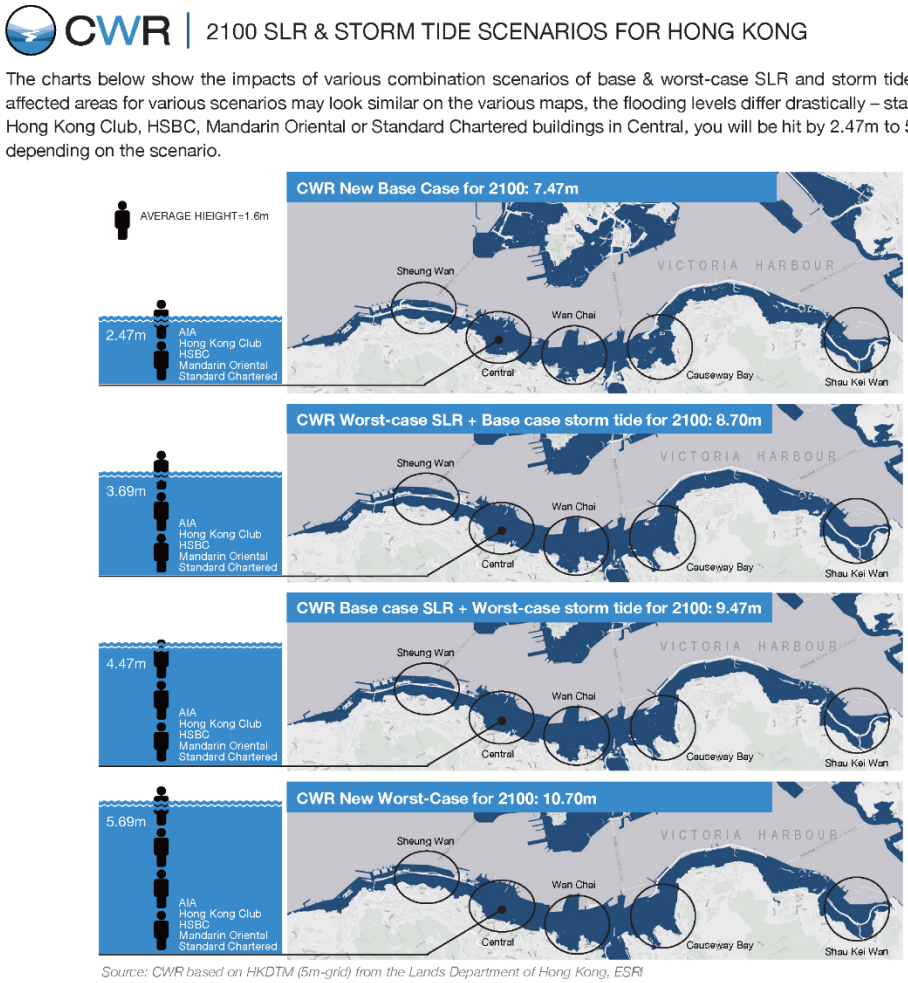
Infographics & quick stats: What's at stake

Subsidence and storm surge exacerbate threats



Source: CWR based on NASA SRTM (30m-grid), ESRI
Infographic © China Water Risk 2020, all rights reserved

Note: Tides have not been factored in but local SLR estimates are used



The charts below show the impacts of various combination scenarios of base & worst-case SLR and storm tides. While the affected areas for various scenarios may look similar on the various maps, the flooding levels differ drastically – standing at AIA, Hong Kong Club, HSBC, Mandarin Oriental or Standard Chartered buildings in Central, you will be hit by 2.47m to 5.69m waves depending on the scenario.

Source: CWR based on HKDTM (5m-grid) from the Lands Department of Hong Kong, ESRI
Note: This graphic has been extracted from the CWR report, "Changing Risk Landscapes: Coastal Threats to Central Banks", 2020
Infographic © China Water Risk 2020, all rights reserved

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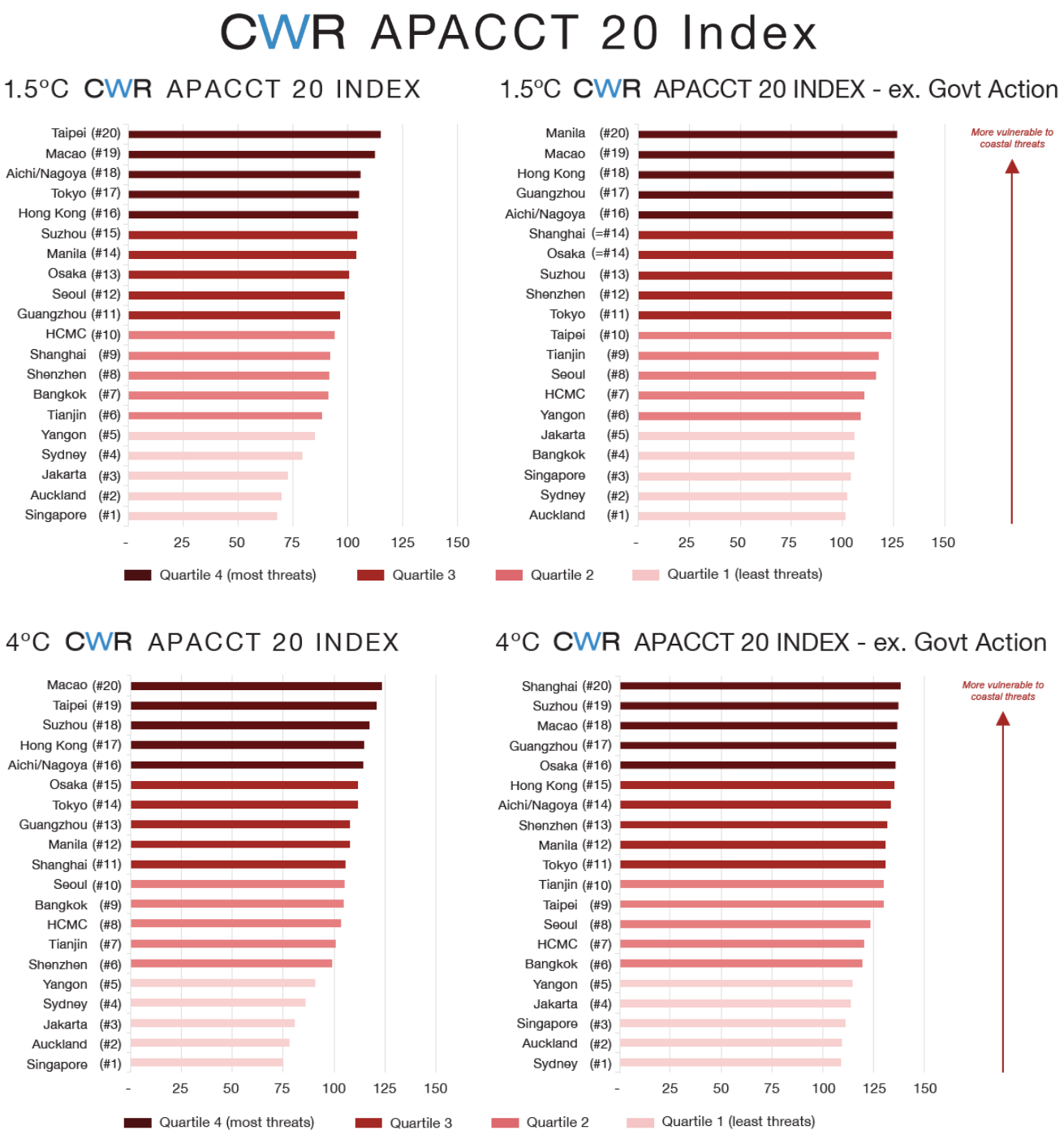
Infographics & quick stats: CWR APACCT 20 Index city rankings



Source: CWR APACCT 20 Index

Infographic © China Water Risk 2020, all rights reserved

The CWR APACCT 20 Index - We have benchmarked 20 capitals & cities in the APAC region for chronic risks presented by coastal threats. Our index reflects mapped stacked SLR risks for four climate scenarios (1.5°C, 2°C, 3°C and 4°C) across key indicators (population, land area and key infrastructure assets) for each city. Storm surge threats from typhoons/tropical cyclones/hurricanes, subsidence plus government adaptation actions to reduce physical risks have also been assessed and benchmarked in the index. Over 100 finance professionals from chairs/directors of bank boards to research analysts as well as financial industry associations, asset owners and financial regulators have provided feedback on the development of this index through survey, one-on-ones and countless Zoom calls.

Source: CWR report "Avoiding Atlantis: The CWR APACCT 20 Index", 2020

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Infographics & quick stats: CWR APACCT 20 Index city rankings

CWR APACCT 20 Index

How to read the index: The CWR APACCT 20 Index includes government adaptation action and so the ex. Govt Action index reflects just the physical risks from coastal threats from SLR, storm surge & subsidence. Changes in rankings between 1.5°C and 4°C indices - ex Govt Action Indices are mainly due to the topography of the city as our index reflects stacked SLR risks for four temperature scenarios.

Governments are doing the most vs. are doing the least to protect their cities

The Top 5 Proactive Cities

- Cities that are less vulnerable are making more adaptation efforts. Singapore, Jakarta and Auckland are in the Top 5 "Least Threats" list and yet they are also amongst the Top 5 Proactive Cities.
- Shenzhen and Shanghai significant adaptation efforts saw their rankings improve in both the 1.5°C and 4°C CWR APACCT 20 Index.
- We expected Tokyo, Seoul, Sydney and Hong Kong to be in the Top 5, but they are not. In fact, Seoul ended up in the Bottom 5 Laggard Cities.

CWR Government Adaptation Analysis

	Proactive		Laggards
#1	Singapore	#16	Seoul
#2	Jakarta	#17	HCMC
#3	Shenzhen	#18	Bangkok
#4	Shanghai	#19	Macao
#5	Auckland	#20	Taipei

Source: CWR reports "Avoiding Atlantis: The CWR APACCT 20 Index" & "City Factsheets", Nov 2020

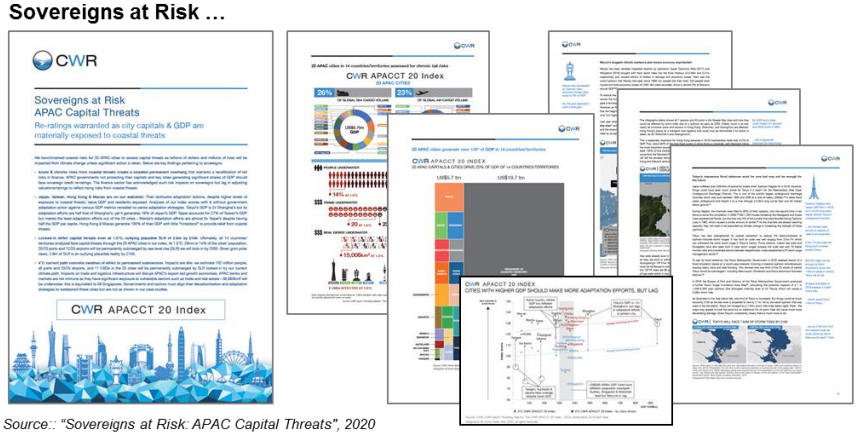
The Bottom 5 Laggard Cities

- Cities that are vulnerable are lagging in adaptation efforts. Macao is particularly at risk at both 1.5°C and 4°C; yet it also lags in adaptation efforts.
- Although Taipei ranks mid-pack in terms of physical risks, its laggard performance on the adaptation front caused it to slip in the CWR APACCT 20 Index rankings to the bottom quartile in both scenarios.
- While Seoul, Ho Chi Minh City and Bangkok are also amongst the laggards, they face relatively less at risk than Taipei and Macao.

Note: Most governments do not disclose all actions being taken to reduce impacts of physical risks, let alone the budget being set aside for it. Also, the exact impacts of government actions to adapt for coastal threats are difficult to quantify as actions are unique across cities. However, with the help of 100+ financial professionals, we reached consensus on key proxy indicators to help benchmark adaptation actions. However, due to the lack of information available, we could not score government adaptation actions at both 1.5° C and 4°C, nor could we score their plans for effectiveness. That said, do check to see if governments are prepared by seeing if they are planning for no-regret scenarios. The worst-case plausible SLR is currently around 3m by 2100 so if they are adapting to that they are on track to protect their cities.

Please see more in-depth government action analysis vis-à-vis various GDP metrics as well as government case studies in our report **"Sovereigns at Risk: APAC Capital Threats"**. CWR welcomes feedback on the CWR APACCT 20 Index – please contact info@chinawaterrisk.org

Sovereigns at Risk …



Source:: "Sovereigns at Risk: APAC Capital Threats", 2020

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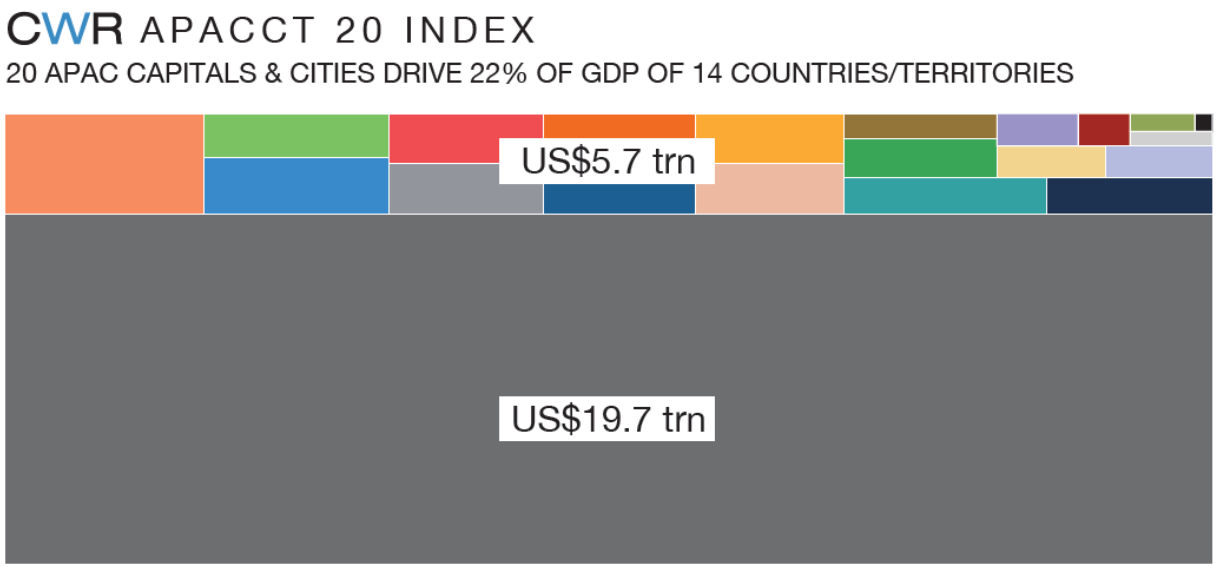
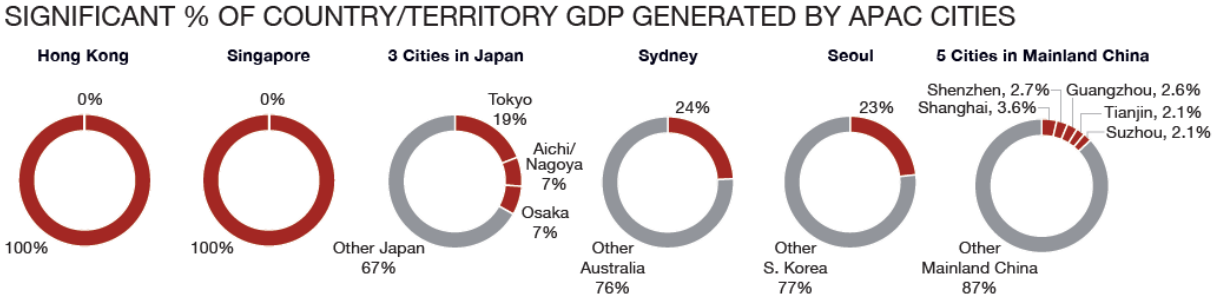
Infographics & quick stats: Triggers of systemic shocks in finance

These 20 coastal capital & economic hubs in the CWR APACCT 20 Index account for:

- US$5.7trn of annual APAC GDP: this is equivalent to annual GDP of Germany and Canada combined. It's not just sizeable but also clustered as 20 cities account for 22% of annual GDP of their respective 14 countries/ territories;
- A large share (25%-100%) of their own country/territory's GDP: ~25% (Sydney, Seoul, Taipei & Yangon), 38% (Auckland & Manila) to 100% (Hong Kong, Macao & Singapore). For Japan, three cities on Tokyo, Aichi/Nagoya and Osaka account for 33% of its annual GDP. Whereas for mainland China five cities of Shanghai, Shenzhen, Guangzhou, Tianjin and Suzhou account for 13% of its annual GDP;
- Trade risk: cities account for 26% of global sea cargo and 23% of global air cargo volumes, yet, 20/23 ports and 12 airports will be impacted by locked-in SLR at 1.5°C;
- Export-led growth, trade, food & energy security at risk: Almost half the cities have trade-to-GDP ratios greater than 100%; ratios can be as high as 312% (HK), 211% (Singapore) and 202% (Seoul). There will also be energy and food security implications for some cities;
- Significant global market risk: The APAC 20 cities have seven stock exchanges that account for US$29trn of equity trading value in 2019 compared to NASDAQ's US$16trn; and
- Substantial loan book risk for "16 APAC Banks": 16 large banks by market capitalisation in five financial hubs in APAC have 66% of their loan books clustered in Japan, Australia/New Zealand, Hong Kong, South Korea and Singapore. Revenues & profits may be even more concentrated.



Source: CWR, World Bank 2018 GDP data, Individual government sources
Infographic © China Water Risk 2020, all rights reserved



Source: CWR, World Bank 2018 GDP data, Individual government sources
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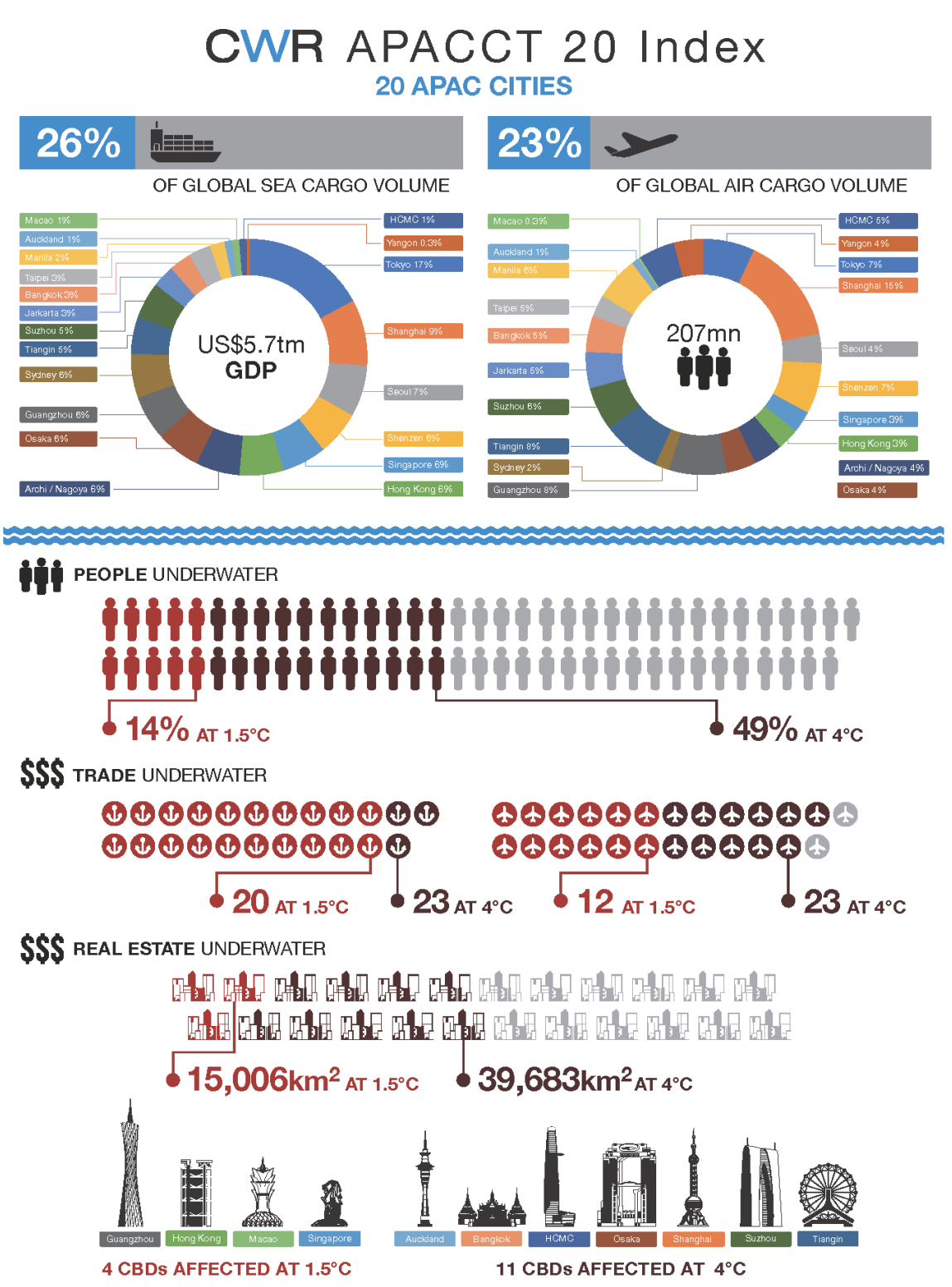
Infographics & quick stats: Triggers of systemic shocks in finance

20 APAC cities in 14 countries/territories assessed for chronic tail risks



Note: Impacts illustrated are conservative as 1) 30m elevation data maps were used to benchmark coastal threats; 2) median of the locked-in SLR range was used and 3) local tide adjustments were not made.

Source: CWR report "Avoiding Atlantis : The CWR APACCT 20 Index", 2020

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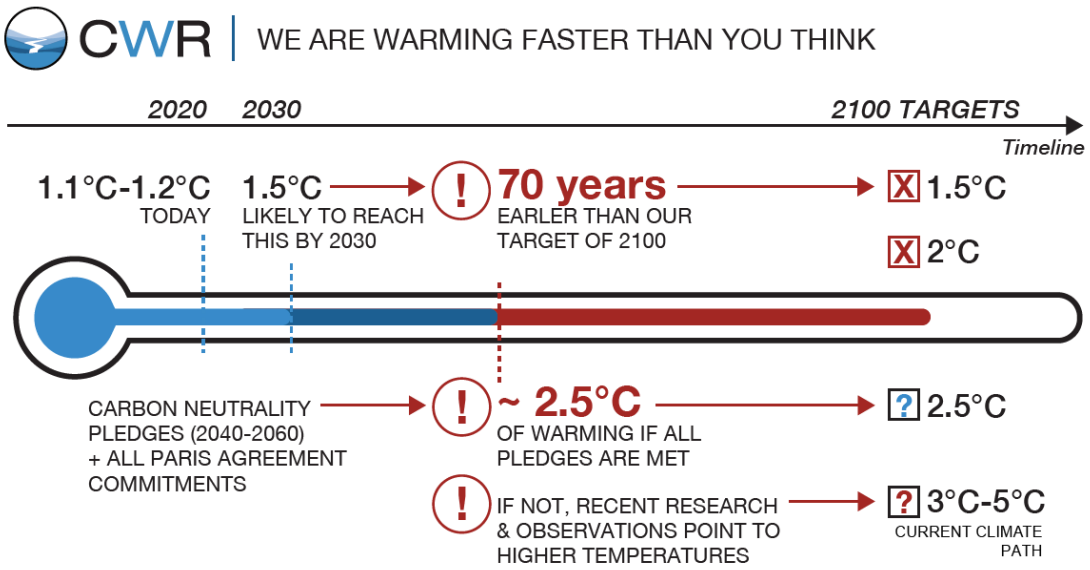
Infographics & quick stats: Need-to-know threats to survive

Fast & furious warming = sooner and greater coastal threats



Source: CWR; WMO (2020); IPCC Special Report 2018; UNEP Emissions Gap Report (2019); Climate Action Tracker; Schwalm et al. (2020); Meehl et al (2020)
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The information and graphics on this page have been extracted from the CWR report, "Changing Risk Landscapes: Coastal Threats to Central Banks", 2020
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1. **Don't let COVID-19 and recent carbon neutrality pledges distract you**; 1.5°C is pretty much locked-in so we must adapt for its impacts now. Another decade of coronavirus is needed to get us back on track for 1.5°C by 2100 and carbon neutrality pledges can help us avoid 4°C but not 1.5°C as those that will make a difference are for 2050 at the earliest;

2. **Our oceans are taking the heat = sea level rise (SLR) + oxygen production at risk**. Oceans have warmed at an alarming rate – the heat absorbed is equivalent to dropping five Hiroshima bombs per second in the ocean for the last 25 years. So the warmer our oceans get, the higher the seas rise due to thermal expansion. And it's not just rising seas, warming oceans will also affect oxygen production;

3. **Greenland and Antarctica are losing ice 6x faster than they were in the 1990s.** 6.4trn tonnes of ice have been lost from 1992 to 2018 – for perspective, this is equivalent to 39x the coal tonnage produced in the same period;

4. **Freshwater threats from melting glaciers.** Vanishing ice from Switzerland to Himalayas eventually end up flowing into the ocean contributing to SLR. Mountain glaciers already face accelerated glacial melt as many mountain regions are already warmer, but beyond SLR, they also bring threats to our freshwater;

5. **Glacier melt and associated SLR will be locked-in when we reach various temperature tipping points.** Although 8m of SLR may occur beyond 2100, we have already locked-in this in at today's temperatures. As we will likely reach 1.5°C as early as 2030, plausible SLR by 2100 can be as high as 3m – see infographic for more;

6. **SLR estimates are conservative = get on top of latest projections!** Don't just rely on SLR estimates from the IPCC to build scenarios; they have a conservative bias and can impede risk management. 3m of SLR is a plausible reality by 2100 – the CWR best-case 1.5°C CWR APACCT 20 Index's locked-in SLR of 2.9m was expected beyond 2200 but may now be an outlying plausible reality by 2100. The CWR base-case 4°C CWR APACCT 20 Index's locked-in SLR of 8.9m was expected beyond 2200 but may now be an outlying plausible reality by 2200; and

7. **Reality check**. The last time we were 0.5°C-1°C warmer than the pre-industrial period, it was during the Last Interglacial Period when SLR was as high as 9.3m; and the last time our world faced similar CO_2 concentrations (400ppm+) our seas were 25m higher – see infographic for more.

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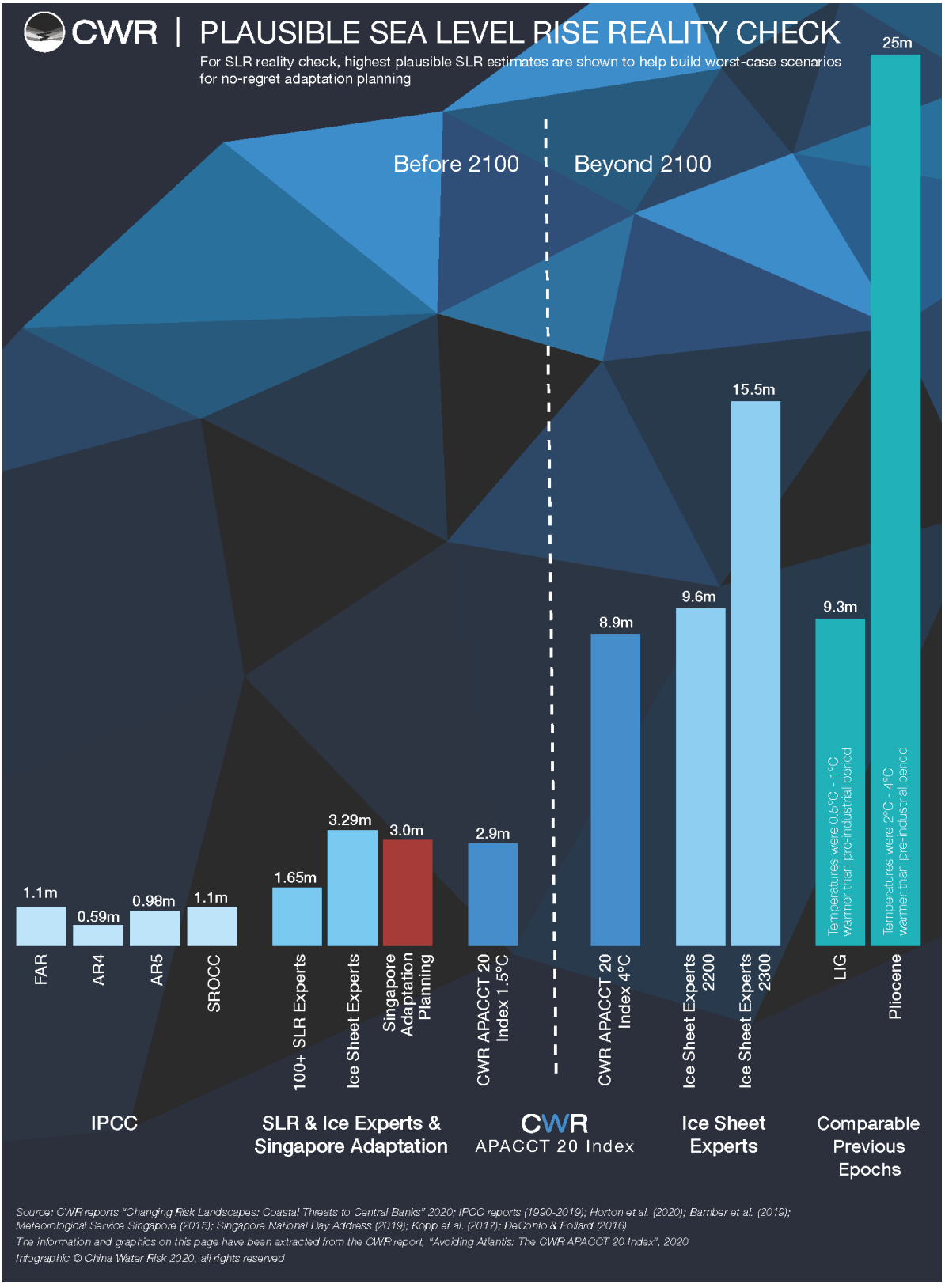
Infographics & quick stats: Need-to-know threats to survive



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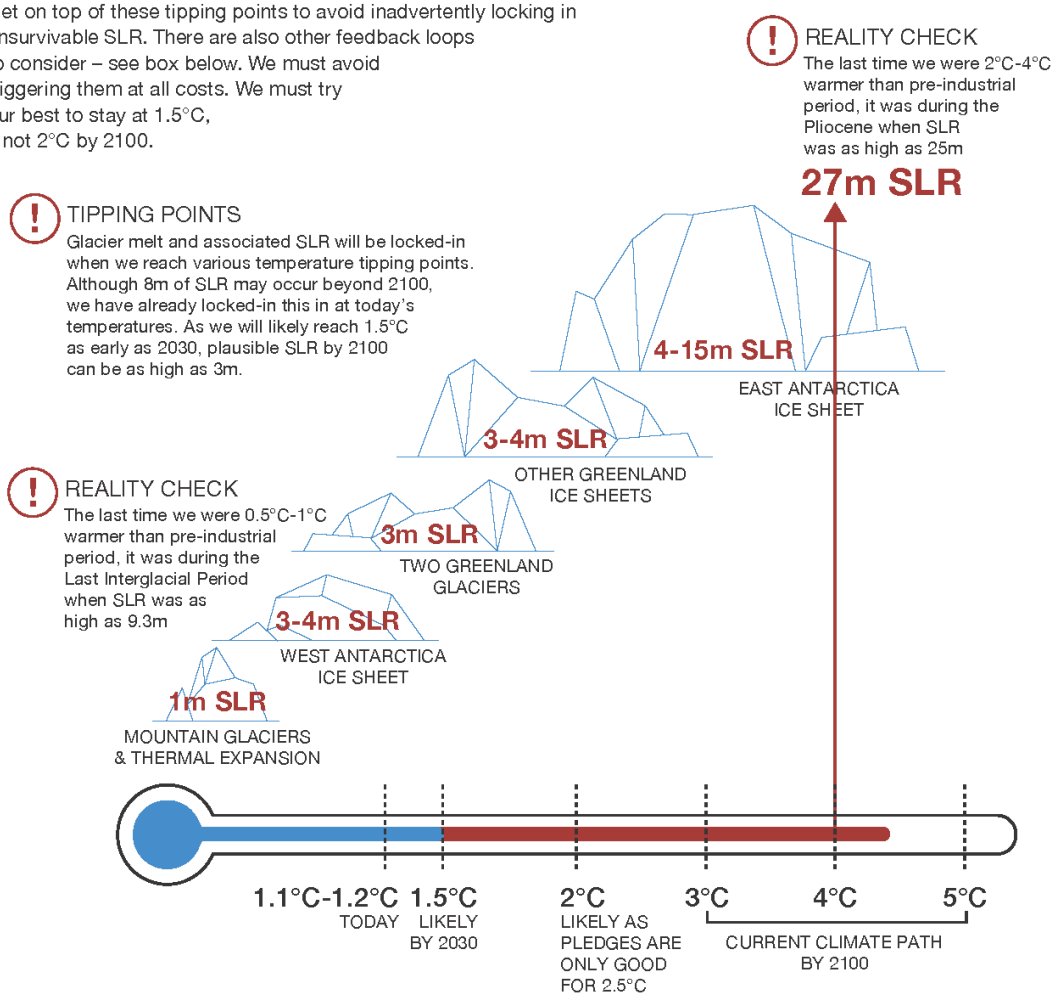
Tipping points & runaway melt – window to act closes by 2030

It's not that far away! We will be 70 years ahead of our 2100 warming target if we reach 1.5°C by 2030. We must start paying attention to temperature trigger points and their SLR impacts. Parts of massive ice sheets covering Antarctica and Greenland, together holding over 60m of SLR, have already started irreversibly melting at today's temperatures. All 2020 observations regarding our cryosphere is grim. Given accelerated ocean warming plus rapid loss of ice in the Polar Regions, we have less than a decade to make a real difference. Get on top of these tipping points to avoid inadvertently locking in unsurvivable SLR. There are also other feedback loops to consider – see box below. We must avoid triggering them at all costs. We must try our best to stay at 1.5°C, if not 2°C by 2100.



Other feedback loops. If we cross a tipping point in our climate, vicious cycles/feedback loops take over and we become irreversibly set (i.e. locked-in) for an uninhabitable planet. Here are two other important feedback loops:

1. **Ice-albedo effect** – A more well-known feedback loop is the ice-albedo effect - the more ice that is melted, the less surface area there is to reflect sunlight. This in turn means the dark ocean surface absorbs the sunlight and accelerates melt. We are already experiencing this feedback loop.
2. **Permafrost thaw** – As our world warms, permafrost (frozen ground) in polar and tundra regions begin to melt, releasing methane, one of the most potent greenhouse gases. This in turn heats the world even more, releasing more methane. *"Permafrost experts agree that even a 30% loss of near-surface permafrost at 1.5°C warming may result in about 50Gt additional carbon emissions by 2100: this, when the 2-degree carbon budget allows only for 275Gt carbon released from all sources."* This additional release of carbon from permafrost has not yet been taken into account by current IPCC carbon budgets.

Source: CWR; International Cryosphere Climate Initiative report (2015); Rignot Expert Opinion (2018); Blackburn et al. (2020); IPCC-SROCC (2019); DeConto & Pollard (2016); Burke et al. (2018)

The information and graphics on this page have been extracted from the CWR report, "Avoiding Atlantis: The CWR APACCT 20 Index", 2020

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Recommended next steps

1. Read "***Waterproofing APAC to Avoid Atlantis***" for an overview of what you need to know about the changing risk landscape, how to assess threat exposure and next steps;

2. Use the CWR APACCT 20 Index to gauge relative coastal risks by seeing index rankings of 20 APAC cities for various scenarios. See who the 100+ finance experts were that inputted into the development of the index and what they had to say in "***Avoiding Atlantis: CWR APACCT 20 Index***";

3. Assess absolute risk exposure to each of the 20 APAC cities using the "***CWR APACCT 20 Index City Factsheets***";

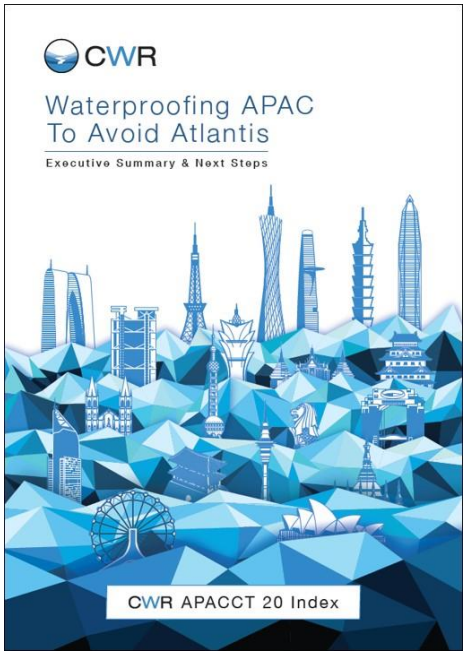
4. Use our How-to-Guides in "***Changing Risk Landscapes: Coastal Threats To Central Banks***" to conduct in-depth analysis of SLR, subsidence and storm risks for hotspots;

5. Assess what governments are doing to protect cities in hotspots compared to what's at risk in terms of GDP "***Sovereigns at Risk: APAC Capital Threats***";

6. Understand actions by financial regulators as they will act to avoid the lethal cocktail of 1) no-sense climate strategies; 2) over-valuation of all assets in vulnerable cities; and 3) concentrated financial risk, which can trigger financial collapse;

7. Supplement the analysis with other recommended tools – the CWR APACCT 20 Index was created to plug a gap in the existing toolbox, but this does not mean the other tools are not useful; and

8. Follow our to-do list for all stakeholders as well as the more specific next steps for central banks & financial regulators, asset owners & asset managers, banks, and governments.



We don't have that long to get prepared.

So get on top of these existential coastal threats and clustered risks today and take steps to waterproof APAC.

START NOW WITH:

Waterproofing APAC To Avoid Atlantis
Executive Summary & Next Steps

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