

Urban Climate Change Research Network and ARC3.2

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and ~100 ARC3.2 Authors

How Cities Can Help to Achieve INDCs
Brazil PBMC and KPMG

COP21 Paris
December 7, 2015

Assessment Report on Climate Change
and Cities ARC3.2 Report

UCCRN Mission

Provide knowledge that enables cities and metropolitan regions to fulfill their climate change leadership potential in both mitigation and adaptation, with a focus on developing resiliency

- Over **600** scientists, scholars, and expert practitioners spanning a broad range of expertise
- More than **100** developed and developing cities around the world
- Formed in **2007** at the time of the C40 Summit in New York



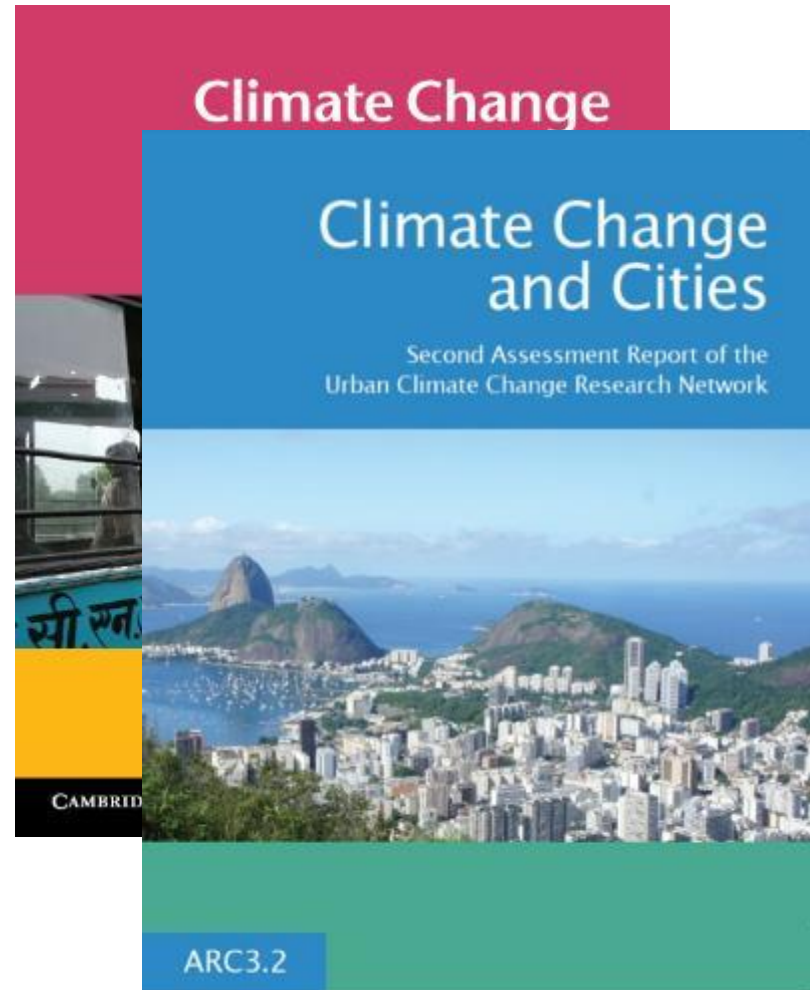
UCCRN ARC3.2 Workshop.
Siemens, The Crystal, London, UK. 2014

ARC3 Report Series

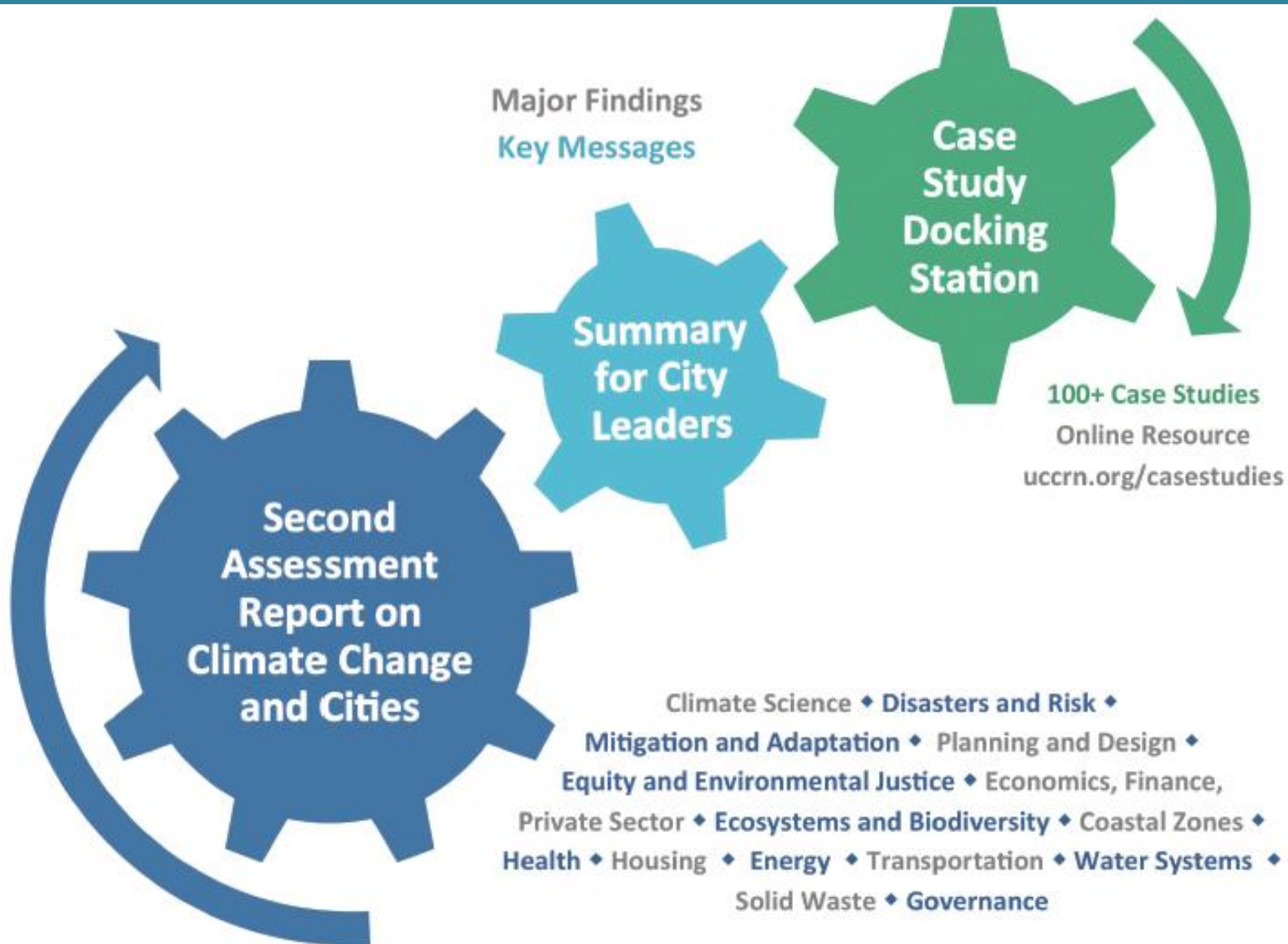
First major publication in 2011 –
*First UCCRN Assessment Report
on Climate Change and
Cities (ARC3)* **four-year** effort by
100 authors from **50+ cities**
around the world

Second UCCRN Assessment Report on Climate Change and Cities (ARC3.2)

- *To be published by Cambridge University Press in 2016*
- ***Summary for City Leaders
launched Dec 4 COP21 CSLL***

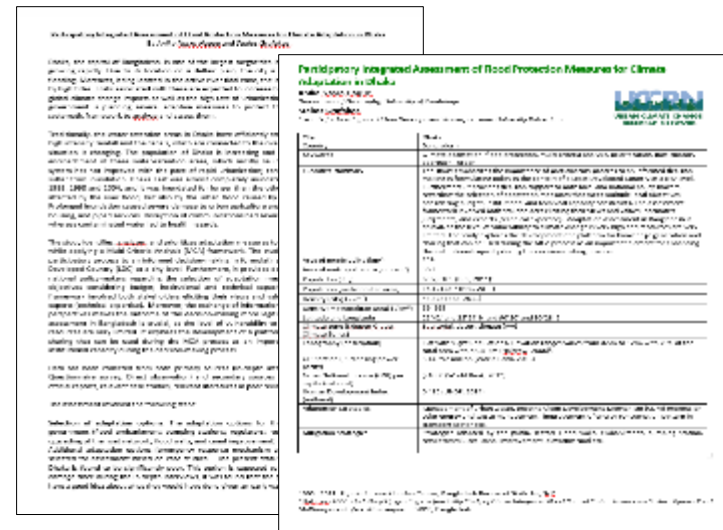


ARC3.2 Framework



ARC3.2 Case Study Docking Station

- Online, searchable, open-source database with ~100 city case studies
- Designed to be useful for both research and practice
- Common data collection protocol to achieve higher level of scientific rigor
- Enable scientifically valid cross-case comparisons
- Inspire local climate action and disseminate information
→ Lessons learned



CSDS link: www.uccrn.org/casestudies

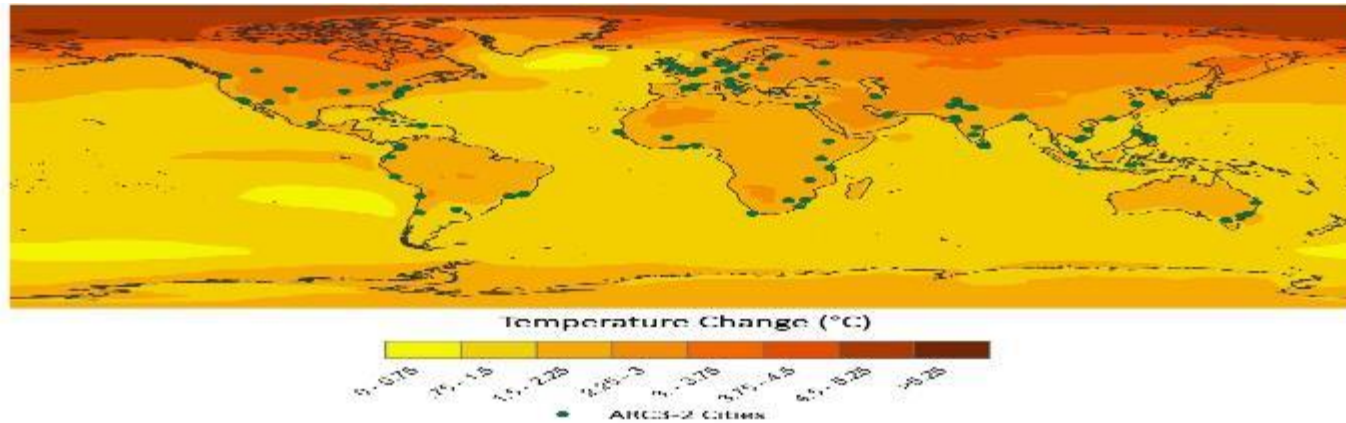
ARC3.2 Latin American Case Studies

- 21 LA Case Studies
- 14 Cities
- 8 Countries
- 8 Adaptation
- 5 Mitigation
- 8 Mitigation/Adaptation



Urban Climate Science

Climate Projections for ARC3.2 Cities



2050s
35 GCMs
RCP4.5

- Temperatures are already rising in cities around the world due to both climate change and the urban heat island effect. Mean annual temperatures in 39 ARC3.2 cities **have increased at a rate of 0.12 to 0.45°C per decade from 1961 to 2010.**
- Mean annual temperatures in 100 ARC3.2 cities are projected **to increase by 0.7 to 1.5°C by the 2020s, 1.3 to 3.0°C by the 2050s, and 1.7 to 4.9°C by the 2080s.**
- Mean annual precipitation in 100 ARC3.2 cities is projected **to change by -7 to +10% by the 2020s, -9 to +15% by the 2050s, and -11 to +21% by the 2080s.**
- Sea level in the 52 ARC3.2 coastal cities is projected **to rise 4 to 19 cm by the 2020s; 15 to 60 cm by the 2050s, and 22 to 124 cm by the 2080s.**

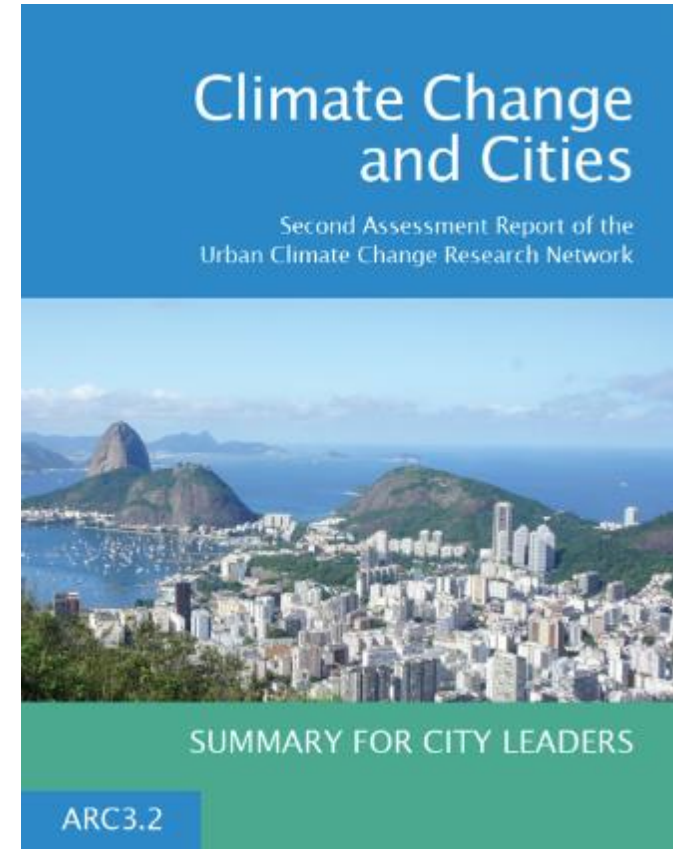
ARC3.2 Summary for City Leaders

Overarching Finding

Transformation is essential for cities to excel in their role as climate-change leaders.

Profound changes will be required in urban energy, transportation, water use, land use, ecosystems, growth patterns, consumption, and lifestyles.

Five pathways to urban transformation emerge throughout ARC3.2.



ARC3.2 Summary for City Leaders

The Five-Fold Path

Pathway 1: **Disaster risk reduction and climate change adaptation** are the cornerstones of resilient cities.

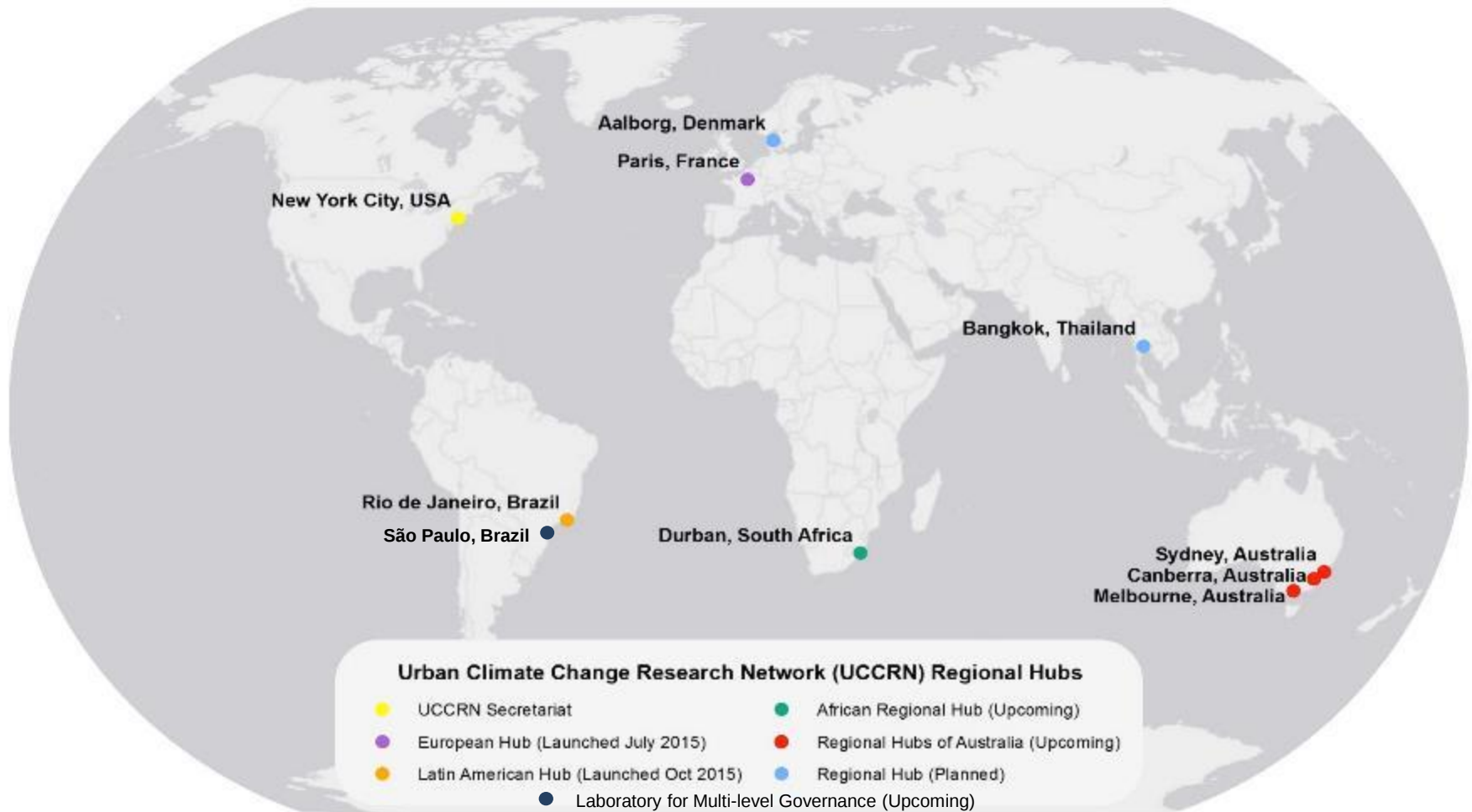
Pathway 2: Actions that **reduce greenhouse gas emissions while increasing resilience** are a win-win.

Pathway 3: Risk assessments and climate action plans co-generated with the **full range of stakeholders and scientists** are most effective.

Pathway 4: Needs of the **most disadvantaged and vulnerable citizens** should be addressed in climate change planning and action.

Pathway 5: Advancing **city creditworthiness**, developing **robust city institutions**, and participating in **city networks** enable climate action.

UCCRN Regional Hubs



Launch of the UCCRN Latin American Hub Rio de Janeiro October 14 2015

Quarta-feira 14.10.2015 2ª Edição

Sociedade

O GLOBO 23

MUDANÇAS CLIMÁTICAS

Futuro em risco

Pesquisa prevê alterações no Rio e em 13 cidades da América Latina, com impactos na saúde

RENATO GRANDILLE
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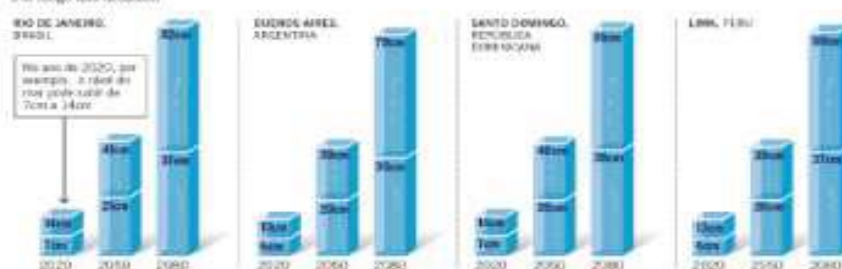
Além de elevar a temperatura, as alterações do clima vão colocar a saúde da população à prova. Na América Latina, ondas de calor podem aumentar a mortalidade de idosos nas próximas décadas. As precipitações multiplicarão a incidência de enfermidades transmitidas por vetores, como malária e febre amarela, inclusive em metrópoles onde já haviam sido erradicadas. A dengue, um mal comum nos meses mais quentes, teria casos registrados durante o ano inteiro. As localidades sem chuvas, por sua vez, registrariam uma quantidade preocupante de doenças cardiorespiratórias e asma. O alerta é da Rede de Pesquisas sobre Mudanças Climáticas Urbanas, um órgão internacional que instalou ontem, no Flórez, no Rio, a sua sede latino-americana. Os dados fazem parte de um relatório que será divulgado em dezembro, na Conferência do Clima em Paris.

A Rede mapeia como as mudanças climáticas devem alterar o cenário de cem cidades no mundo. Seu diagnóstico é que a temperatura global pode subir de 1 a 4 graus Celsius. O índice de precipitação pode variar radicalmente, com aumento de até 25% na redução de aproximadamente 20%, dependendo do centro urbano.

PANORAMA DA REGIÃO

PROGRAMA INTERNACIONAL FAZ PROJEÇÕES SOBRE OS MAIORES DESAFIOS ENFRENTADOS POR ALGUMAS CIDADES

Faixas de aumento do nível do mar (Ao longo das décadas)



Faixas de aumento da temperatura



Efeito estufa ameaça cadeia alimentar marinha

Segundo estudo, pesca predatória e poluição também causam danos

Um estudo da Universidade de Adelaide, na Austrália, publicado na revista "Proceedings" da Academia Nacional de Ciências dos EUA, mostra que as emissões de gases do efeito estufa estão destruindo as cadeias alimentares marinhas. Pesca predatória e poluição nos oceanos também são responsáveis pelo dano. De acordo com a pesquisa, ecossistemas importantes podem ser extremamente prejudicados até 2050.

A destruição da cadeia ali-

Headline: "Future at risk: Study foresees alterations in Rio and 13 Latin American cities, with impact on health"

Source: O Globo, 10/14/2015

For more information, please visit:

www.uccrn.org

@UCCRN



Latin America & ARC3.2

Major findings:

- Latin American cities are highly vulnerable to hazards such as: heavy precipitation, flooding and landslides.
- Many Brazilian cities are strongly engaged in reducing GHG emissions and adaptive planning strategies.
- High priority is given to building resilient infrastructures.
- Ex. Rio de Janeiro's resilience monitoring system.



Digital resilience: the COR's main control room area.

Image copyright: Andrés Luque-Ayala

Temperature Projections for ARC3-2 Latin American Cities

City	2020s	2050s	2080s
Buenos Aires, Argentina	+ 0.5 to 0.9 °C	+ 1.2 to 1.7 °C	+ 1.6 to 3.1 °C
Santa Fe, Argentina	+ 0.6 to 0.9 °C	+ 1.2 to 1.9 °C	+ 1.8 to 3.2 °C
Cubatao, Brazil	+ 0.8 to 1.0 °C	+ 1.5 to 2.1 °C	+ 1.9 to 3.4 °C
Nova Friburgo, Brazil	+ 0.7 to 1.0 °C	+ 1.5 to 2.0 °C	+ 1.8 to 3.5 °C
Rio de Janeiro, Brazil	+ 0.8 to 1.0 °C	+ 1.4 to 2.1 °C	+ 1.8 to 3.4 °C
Sao Paulo, Brazil	+ 0.8 to 1.1 °C	+ 1.5 to 2.3 °C	+ 2.0 to 3.9 °C
Curitiba, Brazil	+ 0.7 to 1.0 °C	+ 1.4 to 2.1 °C	+ 1.9 to 3.5 °C
Antofagasta, Chile	+ 0.9 to 1.2 °C	+ 1.6 to 2.5 °C	+ 2.1 to 3.9 °C
Santiago, Chile	+ 0.7 to 1.1 °C	+ 1.5 to 2.2 °C	+ 1.9 to 3.6 °C
Medellin, Colombia	+ 0.9 to 1.1 °C	+ 1.5 to 2.3 °C	+ 1.9 to 3.7 °C
Santo Domingo, Dominican Republic	+ 0.7 to 1.0 °C	+ 1.4 to 2.0 °C	+ 1.7 to 3.2 °C
Quito, Ecuador	+ 0.8 to 1.1 °C	+ 1.4 to 2.2 °C	+ 1.8 to 3.3 °C
Mexico City, Mexico	+ 1.0 to 1.3 °C	+ 1.8 to 2.5 °C	+ 2.3 to 4.2 °C
Lima, Peru	+ 0.9 to 1.2 °C	+ 1.7 to 2.4 °C	+ 2.1 to 3.6 °C

Projections based on 33 global climate models (GCMs) and 2 representative concentration pathways. Shown are the middle range (25th to 75th percentiles) of model-based outcomes.

Precipitation Projections for ARC3-2 Latin American Cities

City	2020s	2050s	2080s
Buenos Aires, Argentina	+ 1 to 8 %	+ 2 to 9 %	+4 to 13 %
Santa Fe, Argentina	+ 1 to 8 %	+1 to 9 %	+2 to 13%
Cubatao, Brazil	-1 to +4 %	-1 to +9 %	-2 to +14 %
Nova Friburgo, Brazil	-3 to +3 %	-4 to +6 %	-5 to +6 %
Rio de Janeiro, Brazil	-2 to +4 %	-6 to +5 %	-4 to +6 %
Sao Paulo, Brazil	-1 to +4 %	-1 to +9 %	-2 to +13 %
Curitiba, Brazil	0 to +7 %	+1 to 12 %	+2 to 15 %
Antofagasta, Chile	-6 to +2 %	-9 to + 5 %	-8 to +8%
Santiago, Chile	-16 to -2%	-30 to -6 %	-41 to -13 %
Medellin, Colombia	+1 to +9 %	0 to +13 %	0 to +15 %
Santo Domingo, Dominican Republic	-7 to +3 %	-15 to -3 %	-21 to -3 %
Quito, Ecuador	+1 to 14 %	+3 to 21 %	5 to 32 %
Mexico City, Mexico	-4 to +4 %	-7 to +5 %	-10 to +4 %
Lima, Peru	+4 to 29 %	+7 to 48 %	+18 to 78 %

Projections based on 33 global climate models (GCMs) and 2 representative concentration pathways. Shown are the middle range (25th to 75th percentiles) of model-based outcomes.

Sea Level Rise Projections for ARC3-2 Latin American Cities

City	2020s	2050s	2080s
Buenos Aires, Argentina	6 to 13 cm	20 to 39 cm	35 to 79 cm
Rio de Janeiro, Brazil	7 to 14 cm	21 to 41 cm	37 to 82 cm
Santo Domingo, Dominican Republic	7 to 14 cm	20 to 40 cm	38 to 81 cm
Lima, Peru	6 to 13 cm	20 to 39 cm	37 to 80 cm

Projections are based on a 4-component sea level rise methodology, which includes global and local factors: Dynamic ocean height, Thermal expansion, ice loss, land water storage. No subsidence and fingerprint. Model-based components are based on 24 global climate models (GCMs) and 2 representative concentration pathways. Shown are the middle range (25th to 75th percentiles) of outcomes.

The Launch of the UCCRN Latin American Hub and its disclosure results in Brazil

The initiative had in **total 47 positive** outcomes within the national and regional media.

The event was broadcasted in different types of media with high visibility and importance , including TV News on Jornal das 10h (Globo News), Jornal da Record (TV Record), Jornal da Band (TV Band) and Jornal do SBT (SBT); on printed newspapers like O Globo, O Dia, O Estado de São Paulo and Correio Braziliense; on radio stations like CBN and BandNews, in addition to news on websites like Blog do Ministério da Saúde, Portal Brasil, Agência Brasil and Portal R7.