



**Department of  
Financial Services**

# **The Fundamentals of Financial Risks from Climate Change**

## **Mortgage Banking Institutions**

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**February 24, 2021**

# Goals of the Webinar

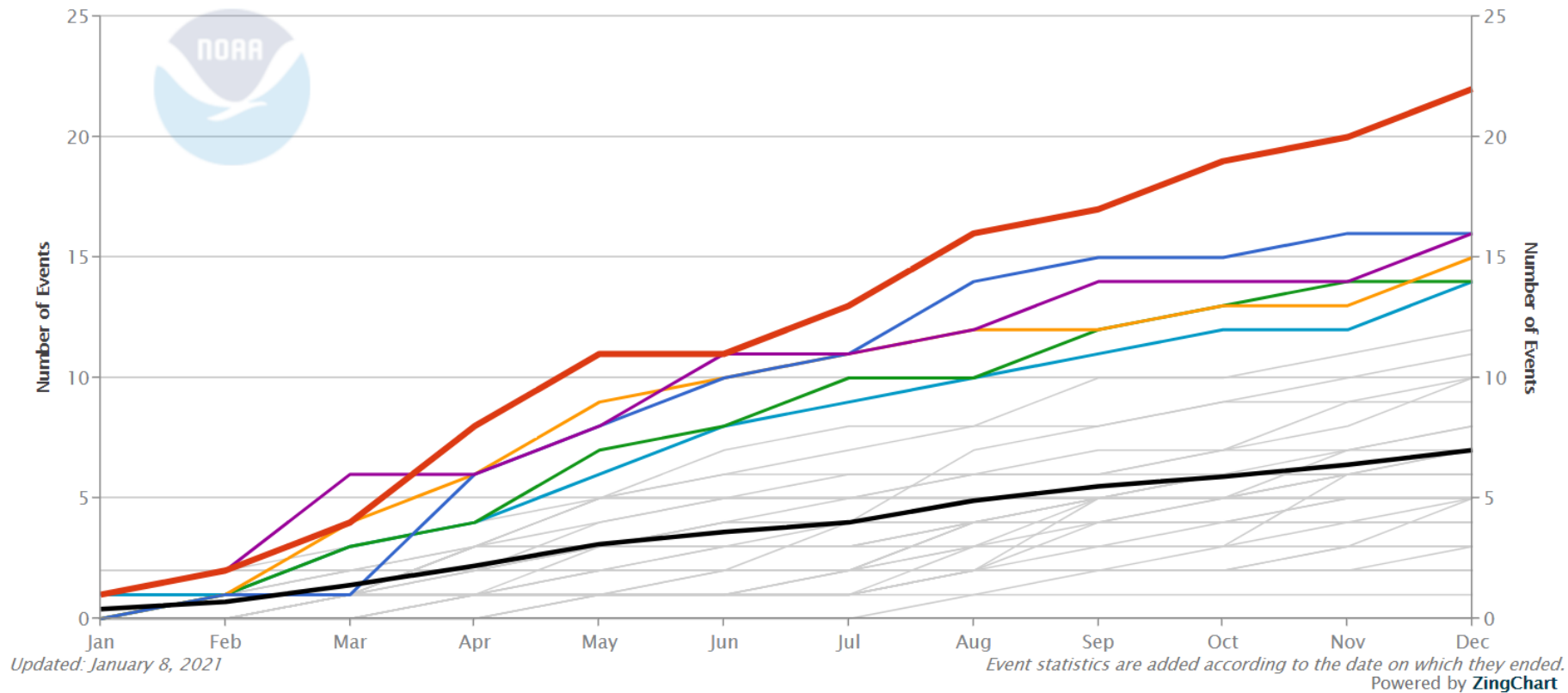
- Orientate you to current climate change issues
- Identify financial risk from climate change
- Share ways to identify and manage climate risks and opportunities.
- Update on federal climate actions

# Mortgage Banking Institutions

- Some do not own the mortgage loans and do not have the rights to the underlying collateral.
- Your climate-related risks do not fully overlap with those of end investors of mortgages.

# 1980–2020 Year-to-Date United States Billion-Dollar Disaster Event Count (CPI-Adjusted)

2018 2019 2016 2011 2017 2020 Average



Source: [National Oceanic and Atmospheric Administration](https://www.noaa.gov/data/analyses/disasters)

# Primary Climate Risk Factors on Financial Markets

## Physical Risks

- Direct
  - Flood
  - Hurricanes
  - Wildfire
  - Heat Waves
- Indirect
  - Disruption to supply chains

## Transition Risks

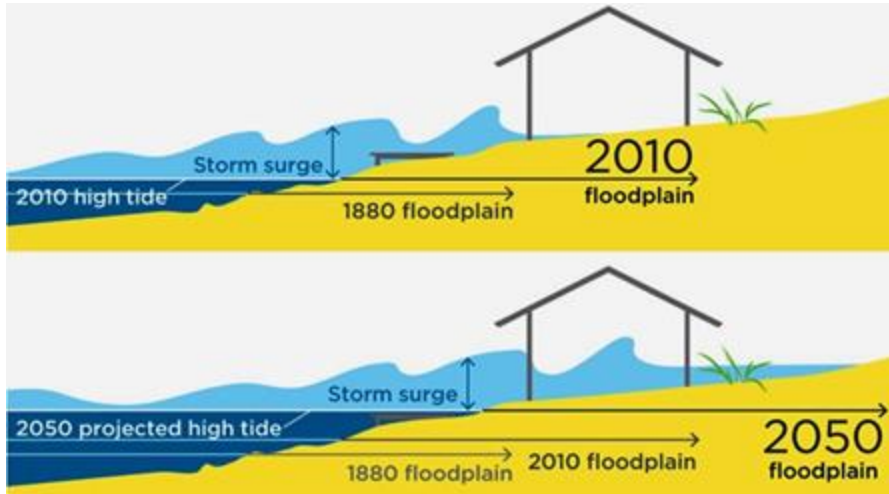
- Driven by the transition to a low-carbon economy
- Re-pricing of carbon-intensive financial assets

# Climate Change and Flooding – Sea Level Rise



Source: [Climate Central](#)

# Storm Surge + Sea Level Rise → More Flooding



Source: [Climate Change.com](https://www.climatechange.com)

## NYC Properties at Risk of Storm Surge

	Total Estimated Reconstruction Value
Single Family Residential	\$285 billion
Multifamily Residential	\$49 billion
Combined	\$334 billion

Source: [CoreLogic 2020 Storm Surge Report](#)

# Nuisance Flooding from Sea Level Rise



- The Battery, Kings Point, and Montauk could have 100 days a year of [nuisance flooding](#) by 2050.

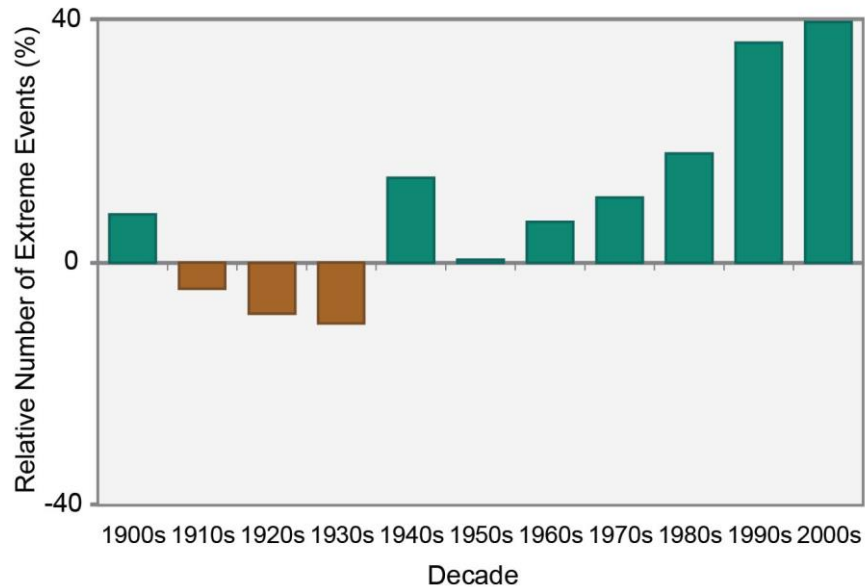
In Florida, areas with higher risks to sea level rise → [Lower home prices](#)

Source: [New York City Panel on Climate Change 2019 Report Chapter 4: Coastal Flooding](#)



# Climate Change and Flooding – Heavier Rains

Observed U.S. Trend in Heavy Precipitation



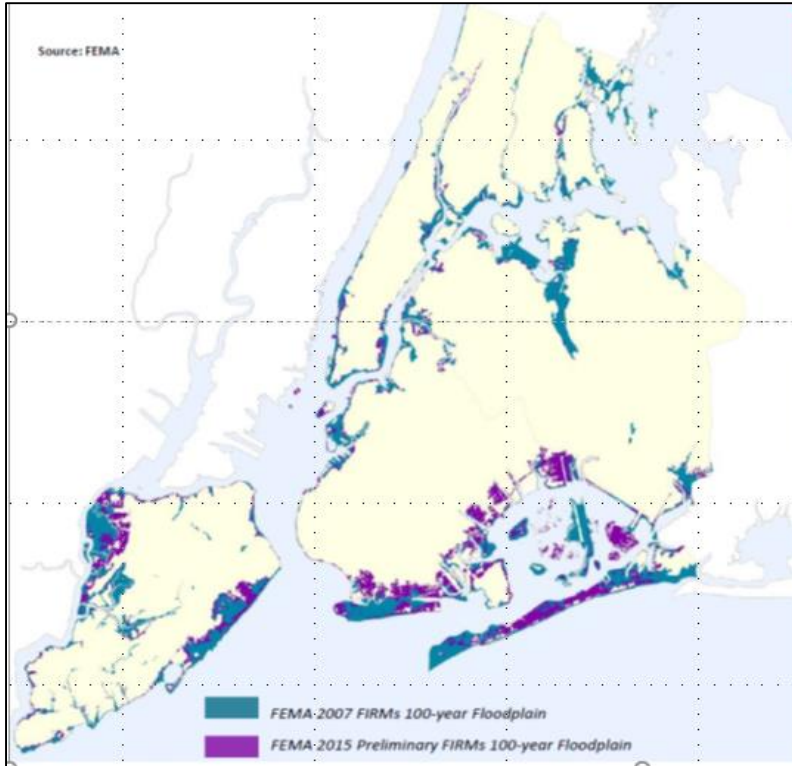
Source: [U.S. Climate Resilience Tool Kit](#)

Hurricane Irene Damage in Keene, NY



Source: [Adirondacks Lifestyle](#)

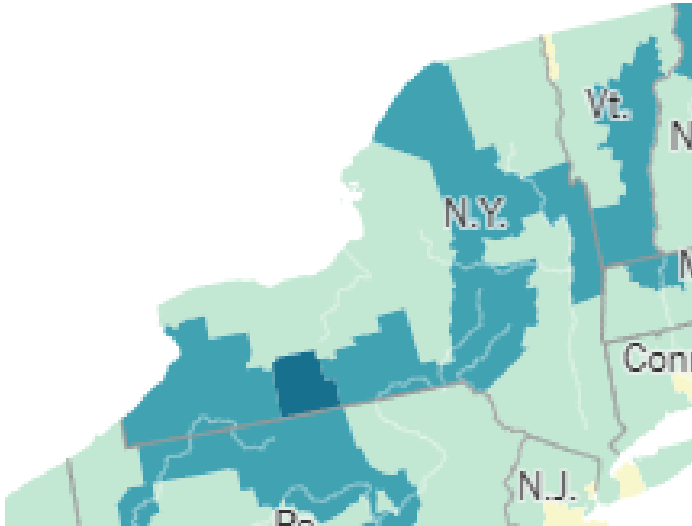
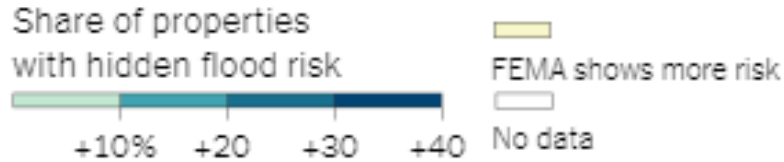
# What is the Flood Risk in New York City?



Comparison of FEMA 2007 Map vs.  
2015 Preliminary Map

In Flood Zones	2007 Map	2015 Map
Residents	218,000	400,000
Jobs	214,000	290,800
Buildings	36,000	71,500
1-4 Family	26,000	53,000
Multifamily	3,200	5,300

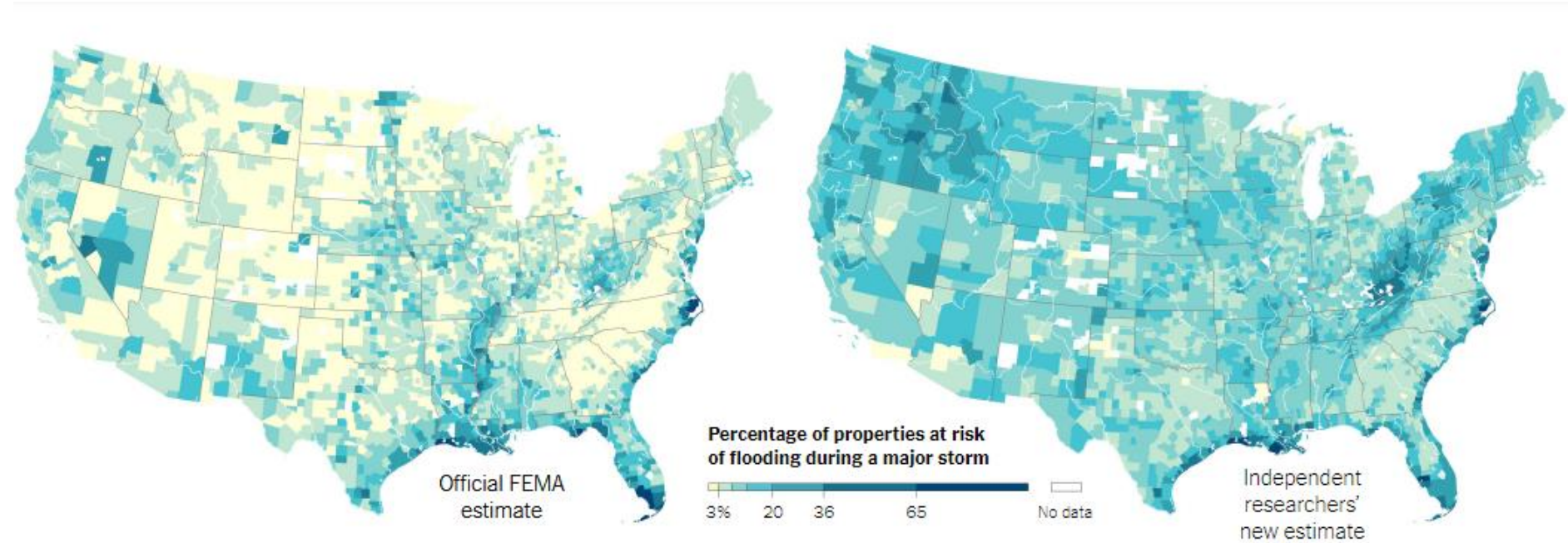
# Flood Risk in Buffalo



Estimation Source	Share of Properties at Risk
FEMA	0.4%
First Street Foundation	17.5%

- Additional properties at risk:  
16,010

# National Flood Risk Comparison



Source: [New Data Reveals Hidden Flood Risk Across America](#)

# Flood's Impact on Mortgage Servicing

Flooding

```
graph LR; A[Flooding] --> B[Increase in non-performing / defaulted loans]; B --> C[Additional staff and resources to manage the change]; B --> D[Loss in servicing revenue];
```

Increase in  
non-  
performing /  
defaulted  
loans

Additional staff  
and resources to  
manage the  
change

Loss in  
servicing  
revenue

# Commercial Mortgages' Flood Exposure

- Eighty percent of the commercial properties damaged in Hurricanes Harvey and Irma lay **outside** of official FEMA flood zone maps  
→ They were likely to have insufficient flood insurance.
- Around two thousand commercial mortgage-backed securities, ~\$56+ billion, were exposed to flooding.
  - More than half estimated to lie **outside** FEMA flood zones.

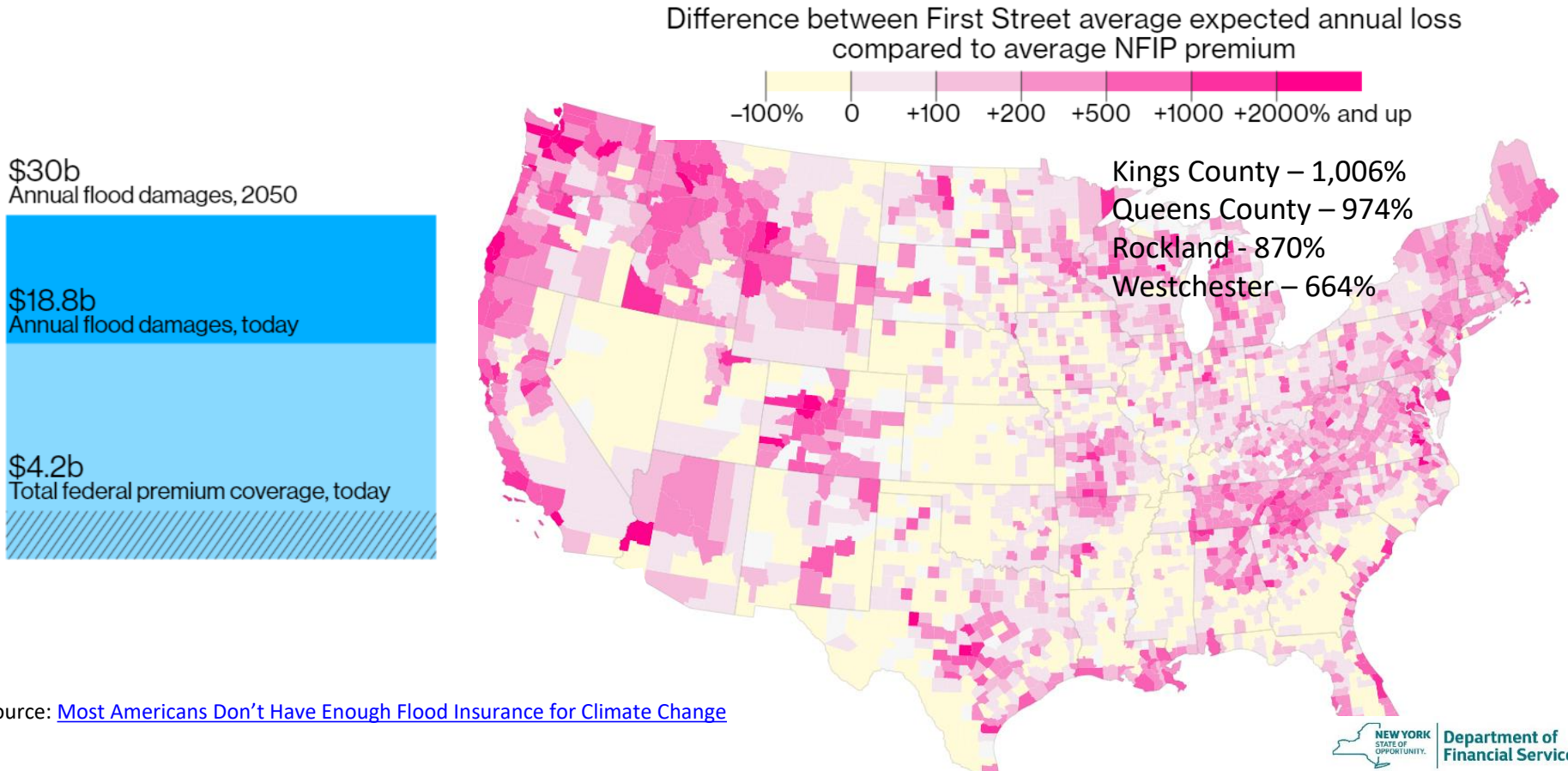
# Flood Risk and Community and Regional Banks

- “Regional and community banks ... are more vulnerable to regionally concentrated physical risk, including to sudden extreme events.”
- “These banks’ property loans tend to be more geographically concentrated than the loans of larger banks. In addition, CRE [commercial real estate] loans constitute a much larger share - nearly a third - of the loan books of small banks.”

– U.S. Commodity Futures Trading Commission’s Climate-Related Market Risk Subcommittee of the Market Risk Advisory Committee, [Managing climate risk in the U.S. Financial system](#)



# Undercharge of Flood Insurance Premium



Source: [Most Americans Don't Have Enough Flood Insurance for Climate Change](#)



# Flood Premium's Impact on Mortgage Servicing

Increase  
in flood  
premium



Drop in  
home  
price



Increase in  
non-  
performing  
/ defaulted  
loans



Additional staff  
and resources to  
manage the  
change



Loss in servicing  
revenue

Financial contagion (market losses, credit tightening) feeding back to the economy

## Economy

Business disruption

Capital scrapping

Reconstruction and replacement

Increase in commodity prices

Migration

## Direct transmission channels

Lower residential property values

Lower commercial property values

Lower household wealth

Lower corporate profitability and increased litigation

## Financial system

Financial market losses  
(equities, bonds and commodities)

Credit market losses  
(residential and corporate loans)

Underwriting losses

Operational risk  
(including liability risk)

## Indirect transmission channels

Wider economic deterioration (lower demand, productivity and output)  
impacting financial conditions

## Physical risk drivers

- Extreme weather events
- Gradual changes in climate

# Credit Rating Agencies on Physical Risks

- Moody's
  - Twenty-five sectors representing \$8.7 trillion in rated debt have very high or high inherent exposure to climate risk.
  - Eighteen sectors with \$7.2 trillion in rated debt have high inherent exposure to physical risk.
- S&P
  - Sixty percent of the companies in the S&P 500 (with a market capitalization of \$18 trillion) hold assets that are at high risk of at least one type of physical risk.

# Transition Risks

- Drivers of the low carbon transition

## Policy or regulation change

- Paris Agreement commitment
- A price on carbon emission
- Phase out of fossil fuel

## Technology advancement

- Lower cost of renewable energy
- Competitive electric vehicles vs. internal combustion engine vehicles

## Consumer Preferences

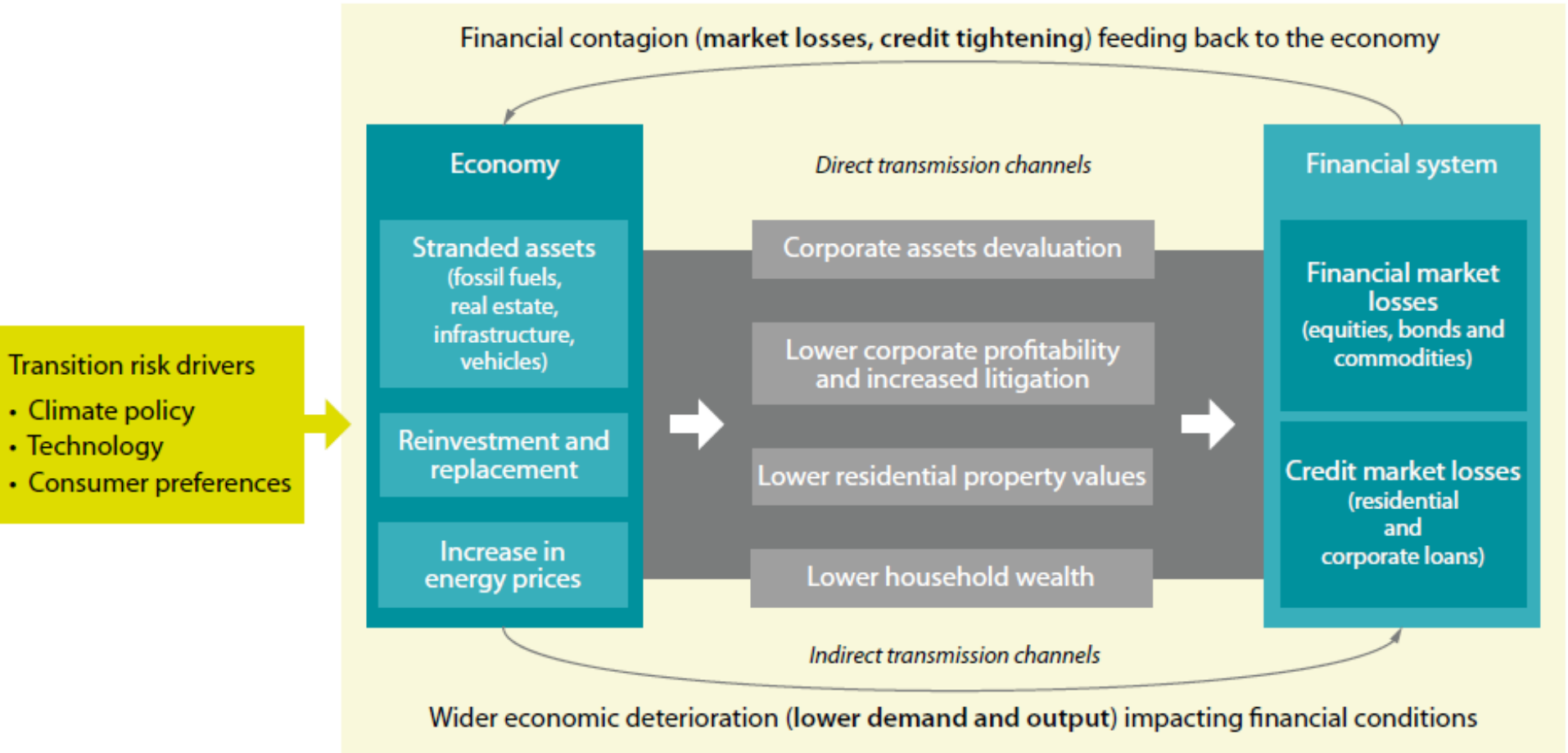
- Voluntary purchase of clean energy

# Low Carbon Transition is Happening

- Renewables are the cheapest sources of new-build power generation for at least two-thirds of the global population.
- In June 2020, BP wrote off \$17.5bn of its oil and gas assets. Shell wrote off \$22 bn assets.
- Gasoline cars phase out
  - Twenty-two countries plan to phase out new internal combustion engine cars between 2027-2040
  - California Executive Order in September 2020 – phase out by 2035

# Transition Risk and Opportunity in Real Estate – change to residential

- Transition risk
  - NYC buildings – 70% of the city's carbon emissions.
  - NYC Local Law 97 requires largest buildings to significantly reduce carbon emissions.
- Transition opportunity
  - High energy efficiency → [low mortgage default rate](#)



# Rating Agencies on Transition

- Moody's
  - Sixteen sectors with \$4.5 trillion in rated debt have very high or high inherent exposure to transition risk
- S&P
  - Downgraded Exxon, Chevron, Conoco by a notch on climate risks and earnings.



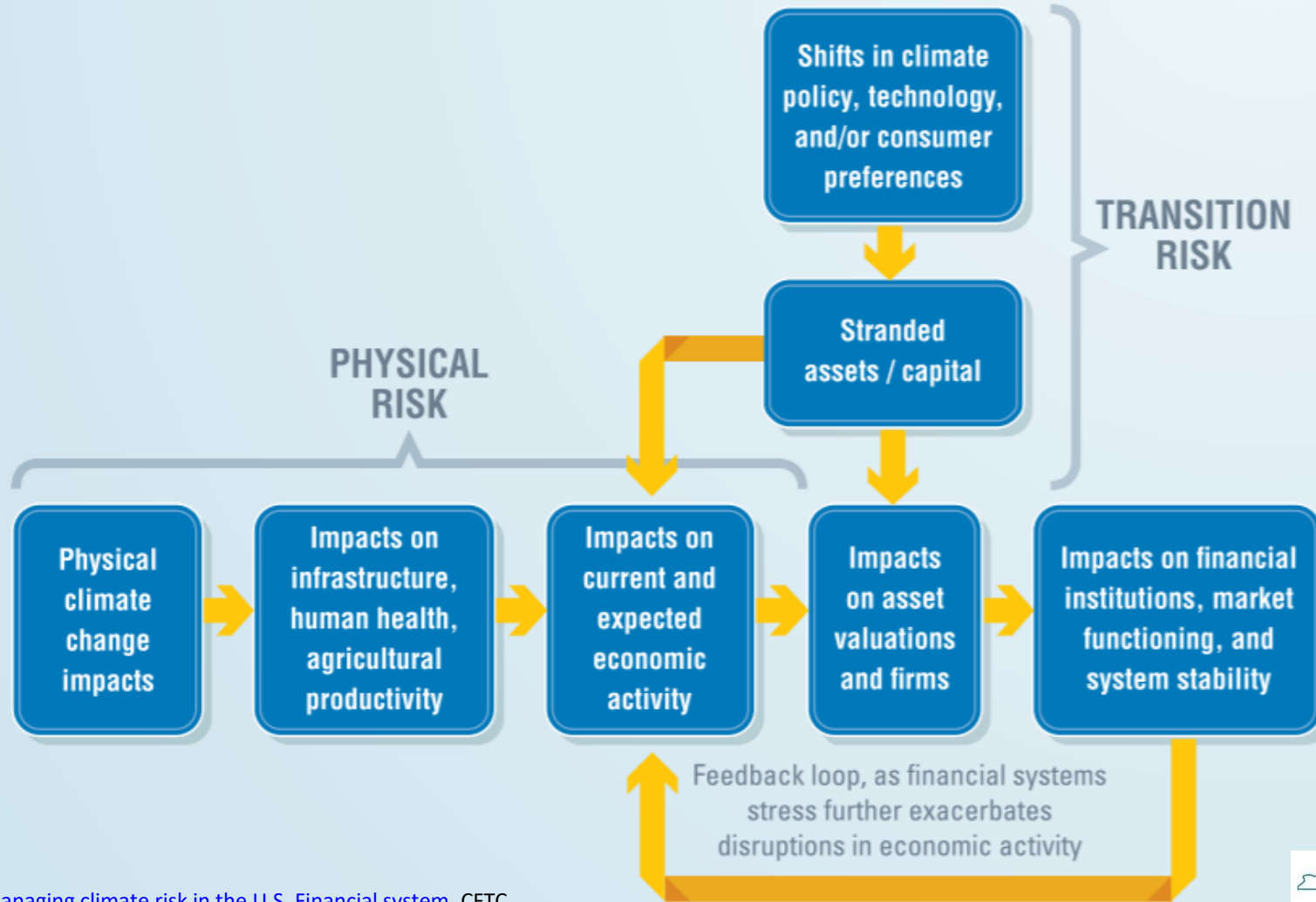
# Potential Impact of Transition Risks on Banking

An abrupt transition to a green economy could trigger an increase in banking-system losses of **up to 60%**.

- Andrea Enria, [\*ECB Banking Supervision's approach to climate risks\*](#)

**“Over half** the syndicated lending of major U.S. banks is exposed to climate transition risk.”

- Ceres, [\*Financing a Net-Zero Economy: Measuring and Addressing Climate Risk for Banks\*](#)



# Financial Risks from Climate Change are Singular and Unprecedented in Nature

## Scope

- Global in scale and scope
- Cannot be contained regionally or diversified away

## Size

- Assets exposed ~ 30% of total financial markets

## Probability

- It is happening

## Duration

- Decades to Millennia

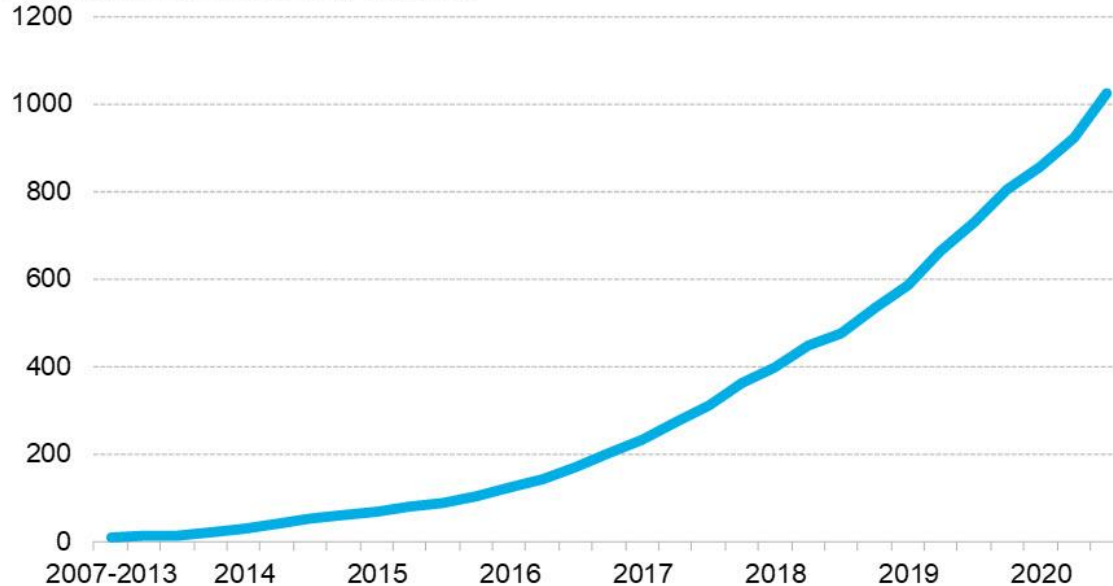
## Dependency

- Future impact heavily is determined by actions today

# Climate-Related Business Opportunities

**Figure 1: Cumulative green bond issuance by quarter, 2007-3Q 2020**

**Cumulative issuance (\$ billion)**



*Source: BloombergNEF, Bloomberg L.P.*

# What are Your Peers Doing?

## Risk management

- Board and executive management committee's involvement in climate risk discussions
- Analyze flood risk using new flood map in mortgage underwriting

## Lending / Servicing

- Green Mortgages by Fannie, Federal Housing Administration, and Veterans Affairs

# DFS's Climate-Related Actions

- Industry Letter on [Climate Change and Financial Risks](#)
  - Its purpose
  - Set expectations for all New York banks and non-depository mortgage companies to **start**
    - Integrating **financial risks** from climate change into their **governance, risk management, and strategies**; and
    - Developing a **disclosure** approach.
  - Institutions should take a **proportionate** approach.
- Coordinating with federal counterparts, National Association of State Credit Union Supervisors, and Conference of State Bank Supervisors

# U.S. Federal Level Climate Updates

- The White House
  - Rejoined the Paris Climate Agreement - Aim to reduce 26-28% greenhouse gas emission below 2005 levels by 2025;
  - Plan to move the US economy to net zero emissions no later than 2050;
  - Plan to achieve 100 percent clean energy by 2035 and create 10 million new jobs.

# Federal Housing Finance Agency (FHFA)

- Request for information on climate and natural disaster risk management at the regulated entities – January 2021
- Areas for inputs
  - Identifying and assessing climate and natural disaster risk
  - Enhancing FHFA's supervisory and regulatory framework



# Managing Climate Risk vs. Other Risks

- Similar approach as managing other risks
- Does need new expertise but everyone can get started
- DFS's support and supervision
  - Webinars
  - Roundtables
  - A voluntary and anonymous survey
  - Development of climate-related exam process

# Questions? Feedback?

Contact: [climate@dfs.ny.gov](mailto:climate@dfs.ny.gov)



- Did the webinar motivate you to start understand the potential financial risks from climate change on your business?
  - Yes
  - No. Please select your barrier(s) in the next question.
- If you answer no in the previous question, what are your barrier(s)? Please check all that apply.
  - Do not have the expertise on climate
  - Have other more pressing and immediate priorities
  - Do not think climate change poses a material risk to my business.
  - Others (please specify below)
- If you choose others in the previous question, please put in your answer here.
  - [space for qualitative answers]
- What areas that you would like to hear more or still have question on?
  - Physical risks and their financial impacts on the residential mortgage space
  - Transition risks and their financial impacts on residential mortgage space
  - Climate-related opportunities
  - DFS's expectations and timeline
  - Practical tools on how to measure the financial risks from climate change
  - Others (please specify below)
- If you choose others in the previous question, please put in your answer here.
  - [space for qualitative answers]
- What did you think of the length of the presentation?
  - Just right
  - Too long
  - Too short
- What did you think of the depth of the presentation?
  - Just right
  - Too deep
  - Not deep enough
- What did you think of the examples given in the presentation on how climate change impacts the financial system?
  - Just right
  - Too many
  - Too few
- Do you have any other questions or suggestions on how the information was presented to you?
  - [space for qualitative answers]
- Do you have any questions or suggestions on DFS's climate work in general?
  - [space for qualitative answers]