

# Supply Chain Resiliency in Uncertain Times

June 2022

Date



Canpotex





# The world needs more food

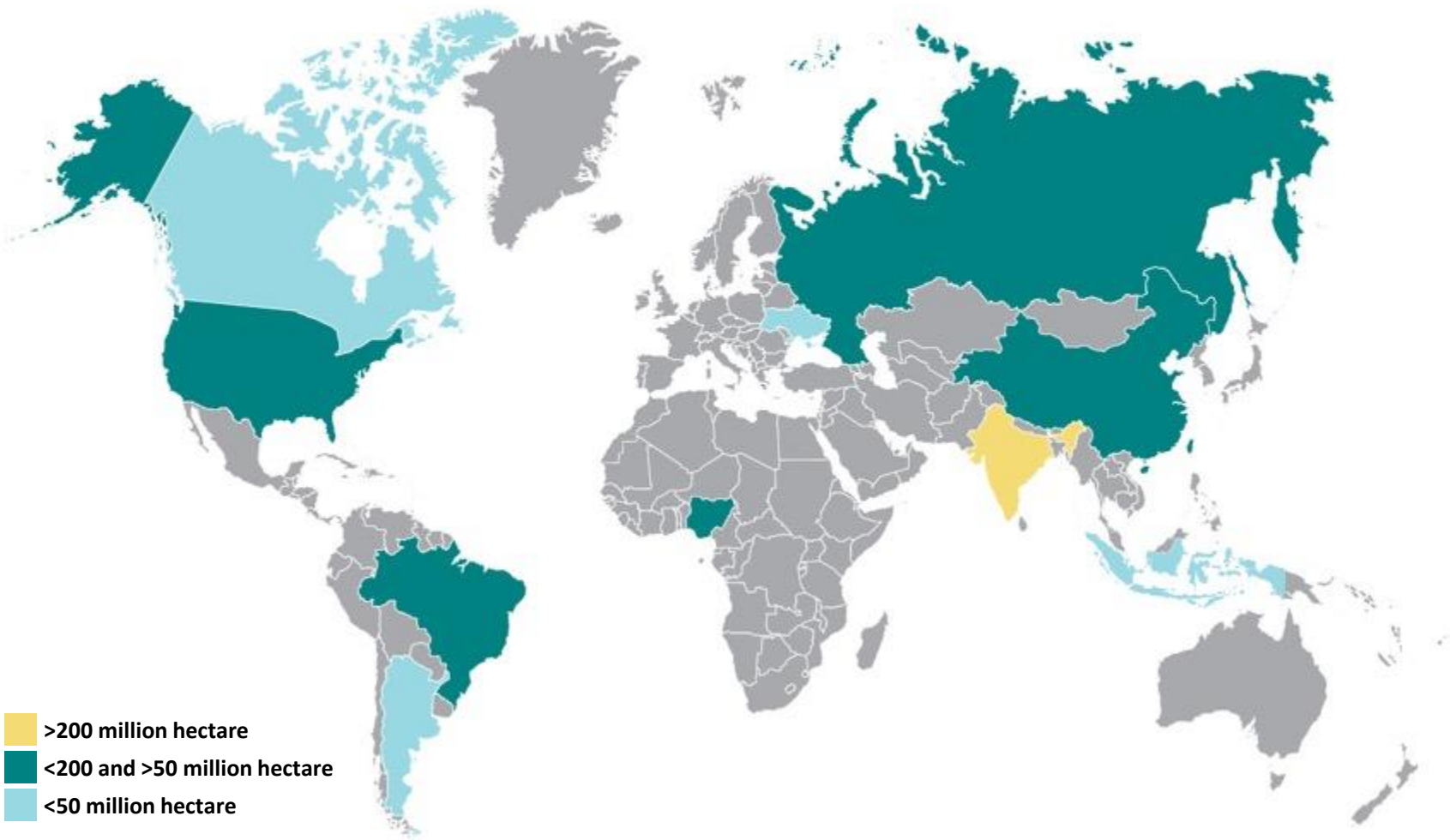
Improving crop yields is key to achieving food security

The world will need to produce 50% more food by 2050

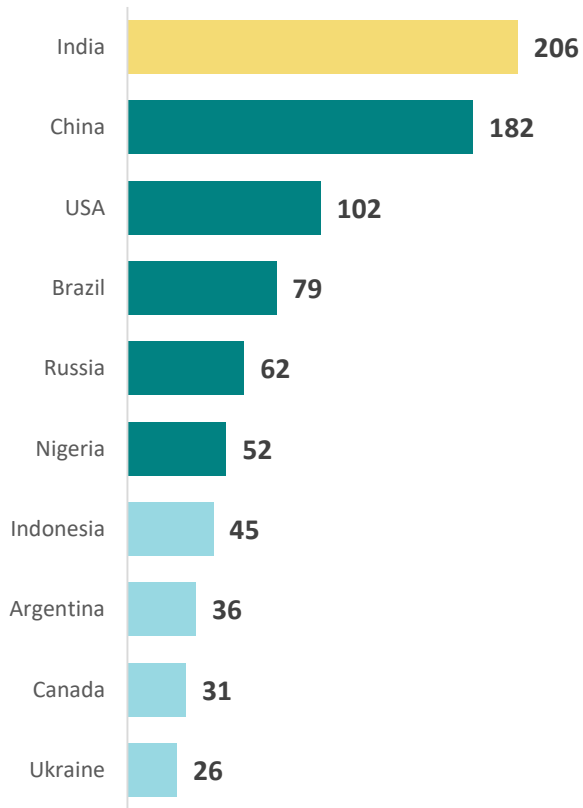
Source: *Creating A Sustainable Food Future*, Final Report -World Resource Institute (2019)

# Global agricultural production

Top 10 food-producing countries represent almost 60% of total production



Top 10 producing countries  
Planted area (million hectare) - 2018

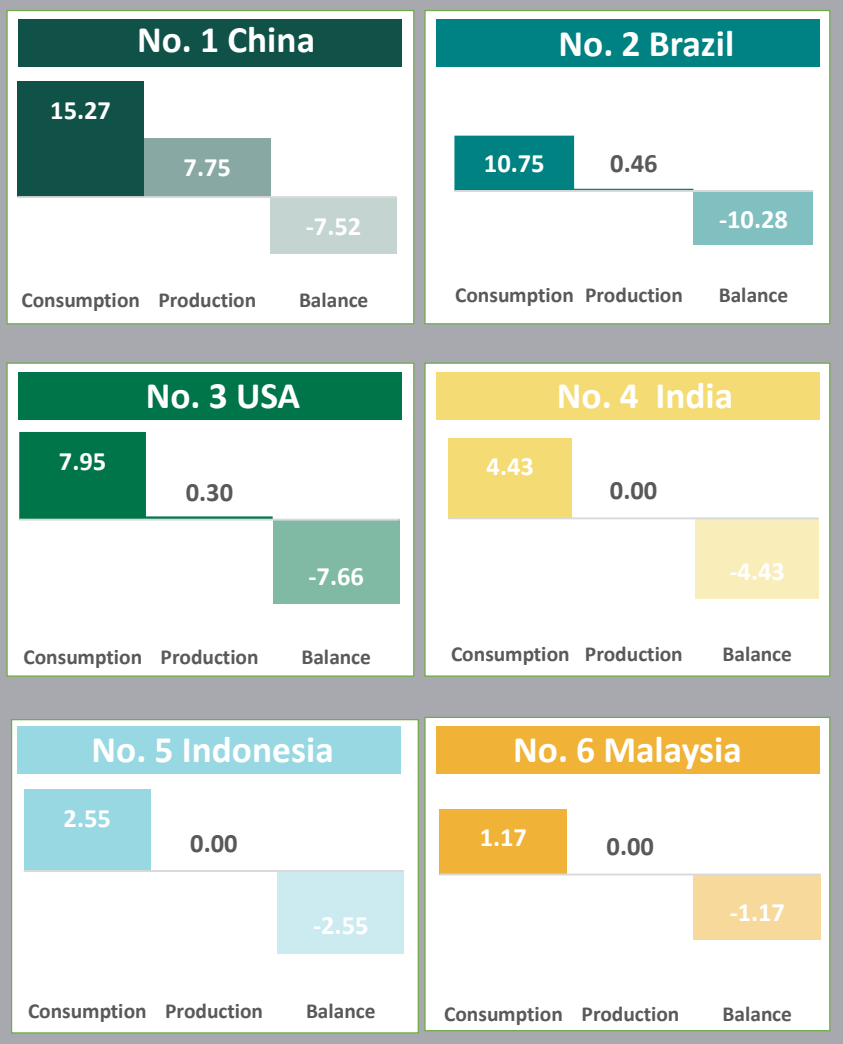
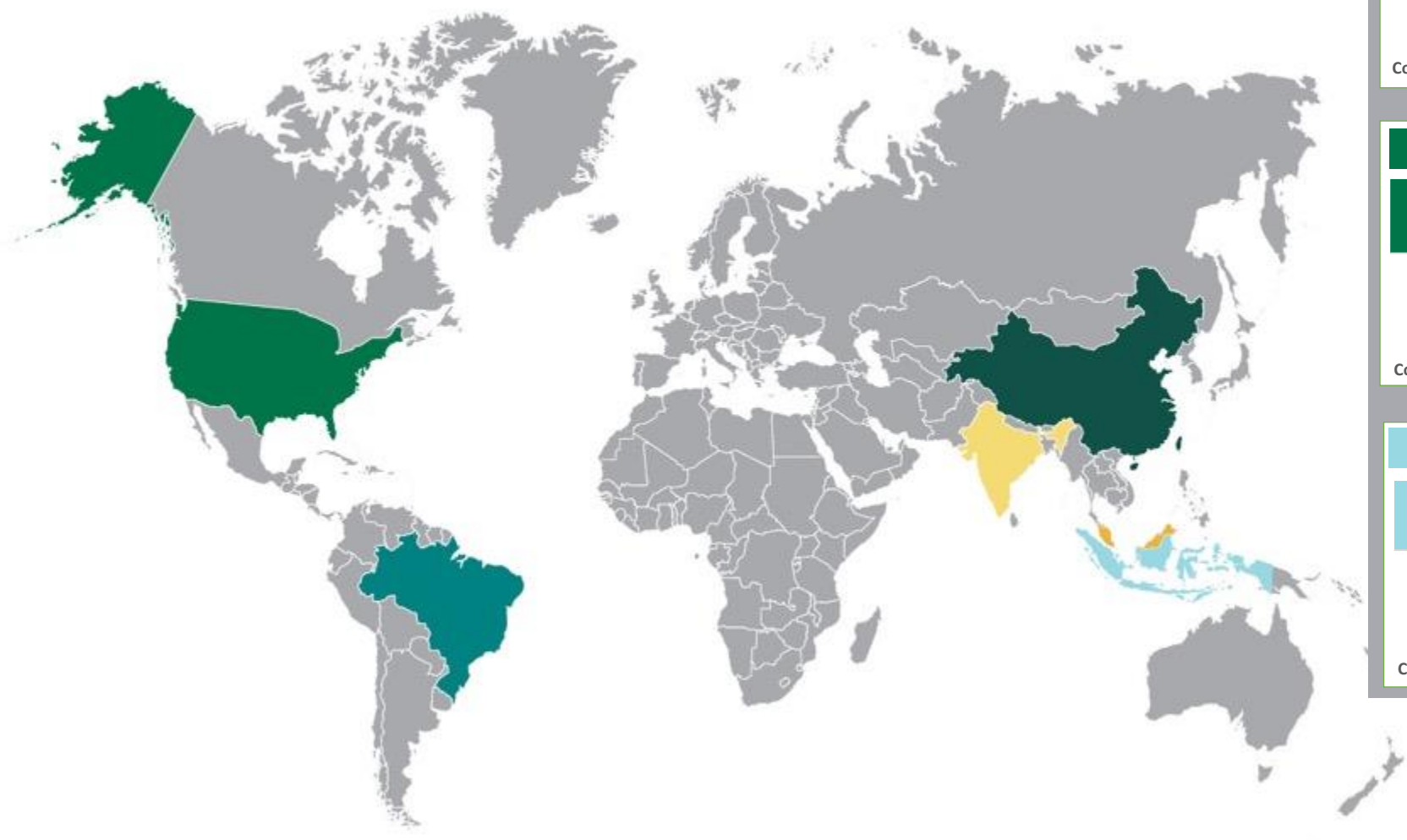


Source: Food and Agriculture Organization of the United Nations. (2020). FAOSTAT: Value of Agricultural Production. Retrieved from <http://www.fao.org/faostat/en/#data/QV>



# The six largest consumers of potash

China is the leading consumer and Brazil is the leading importer



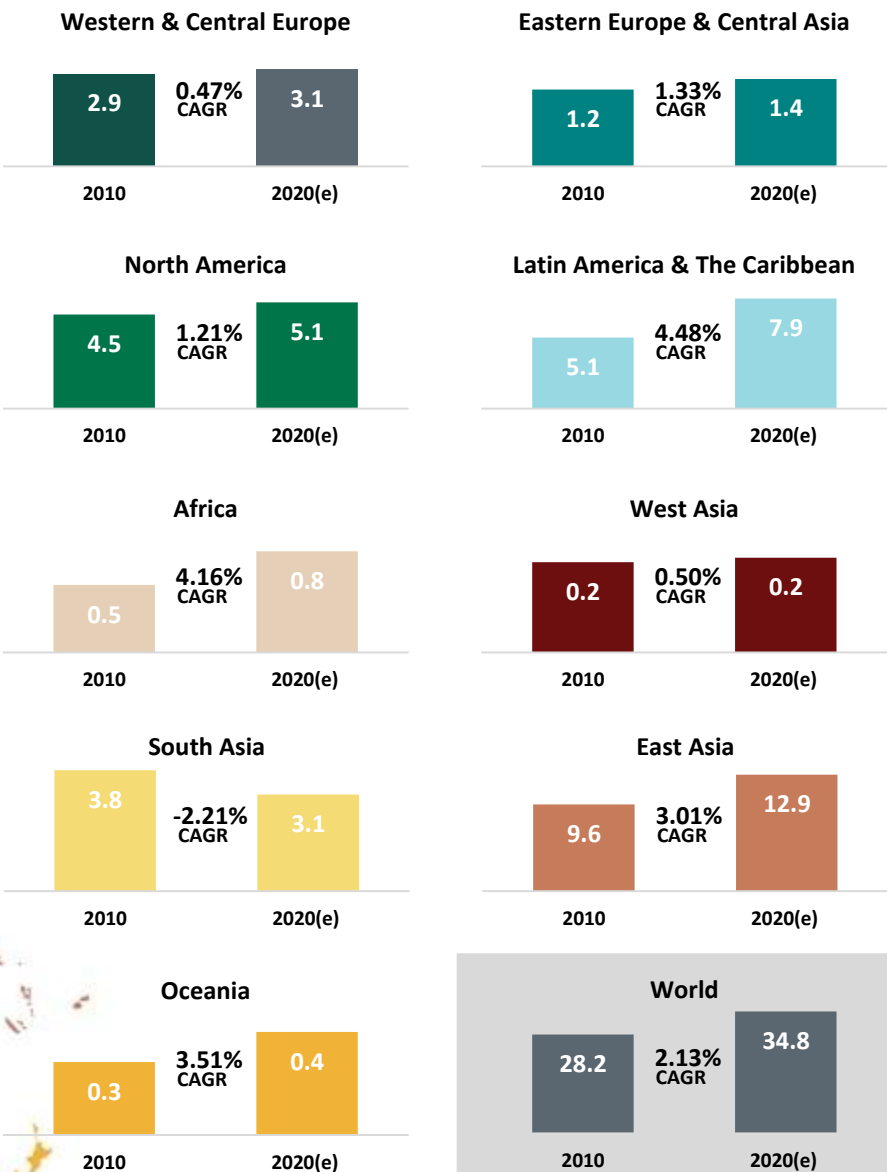
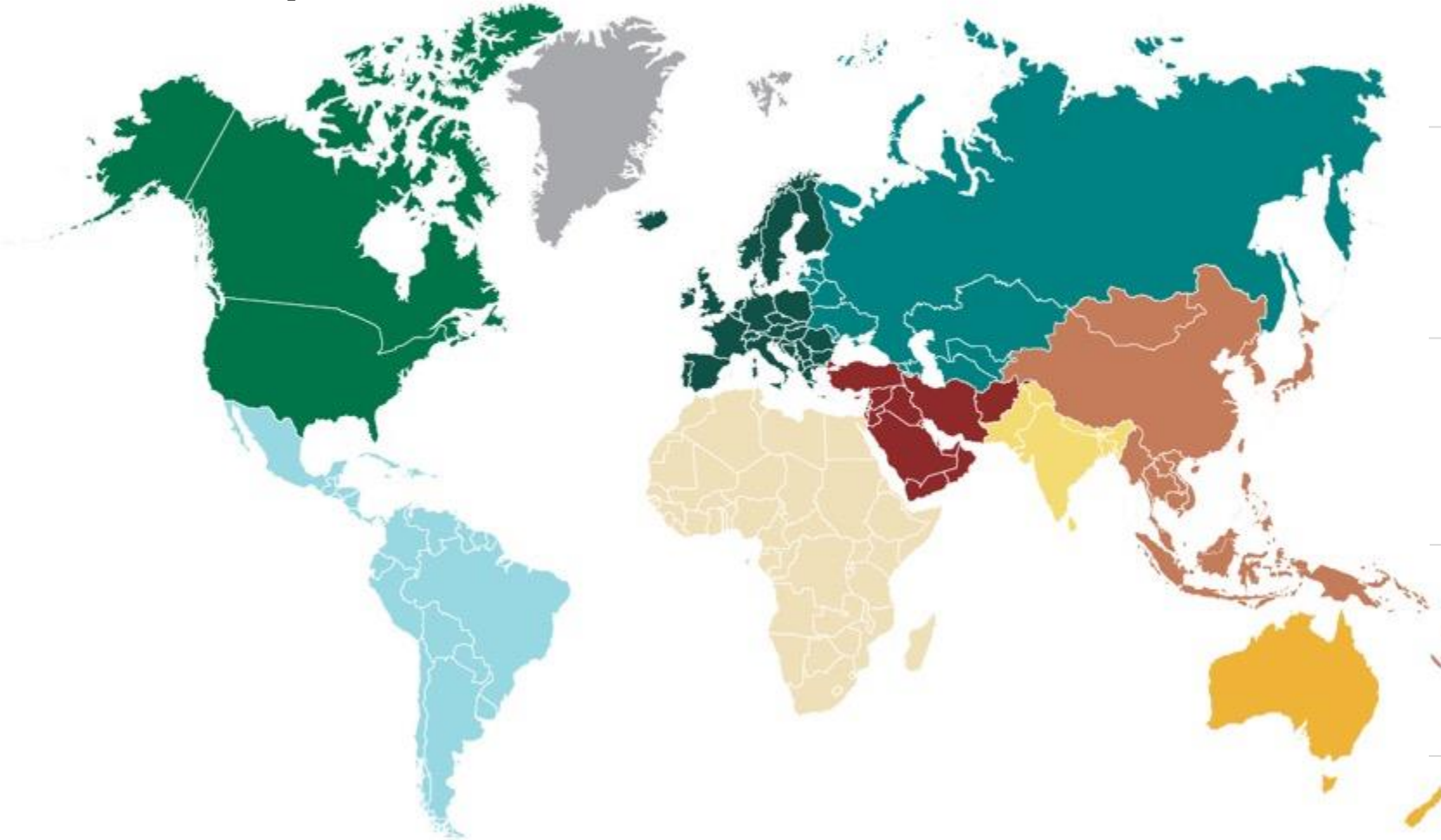
\*Million Metric Tonnes (MMT) MOP

Source: International Fertilizer Association. (2019). Retrieved from <https://www.ifastat.org/databases/supply-trade>

# Potash consumption is growing

Potash Consumption (2010-2020 est.)

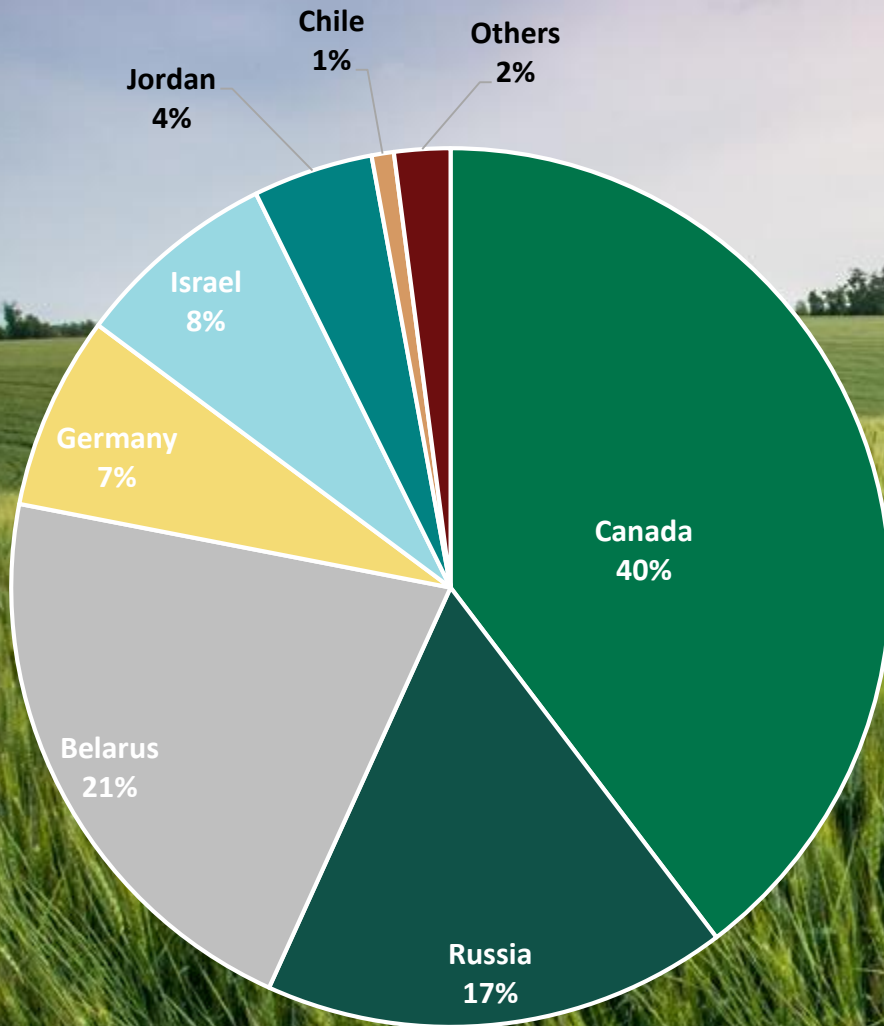
Million MT of K<sub>2</sub>O



Source: International Fertilizer Association. (2019). *IFASTAT Database: Consumption*. Retrieved from <https://www.ifastat.org/databases/plant-nutrition>

## Potash Exports Share (2019)

% of total



Source: International Fertilizer Association. (2020). *IFASTAT Database: Consumption*. Retrieved from <https://www.ifastat.org/databases/plant-nutrition>

# Canada is the world's largest exporter of potash

We succeed in very competitive markets

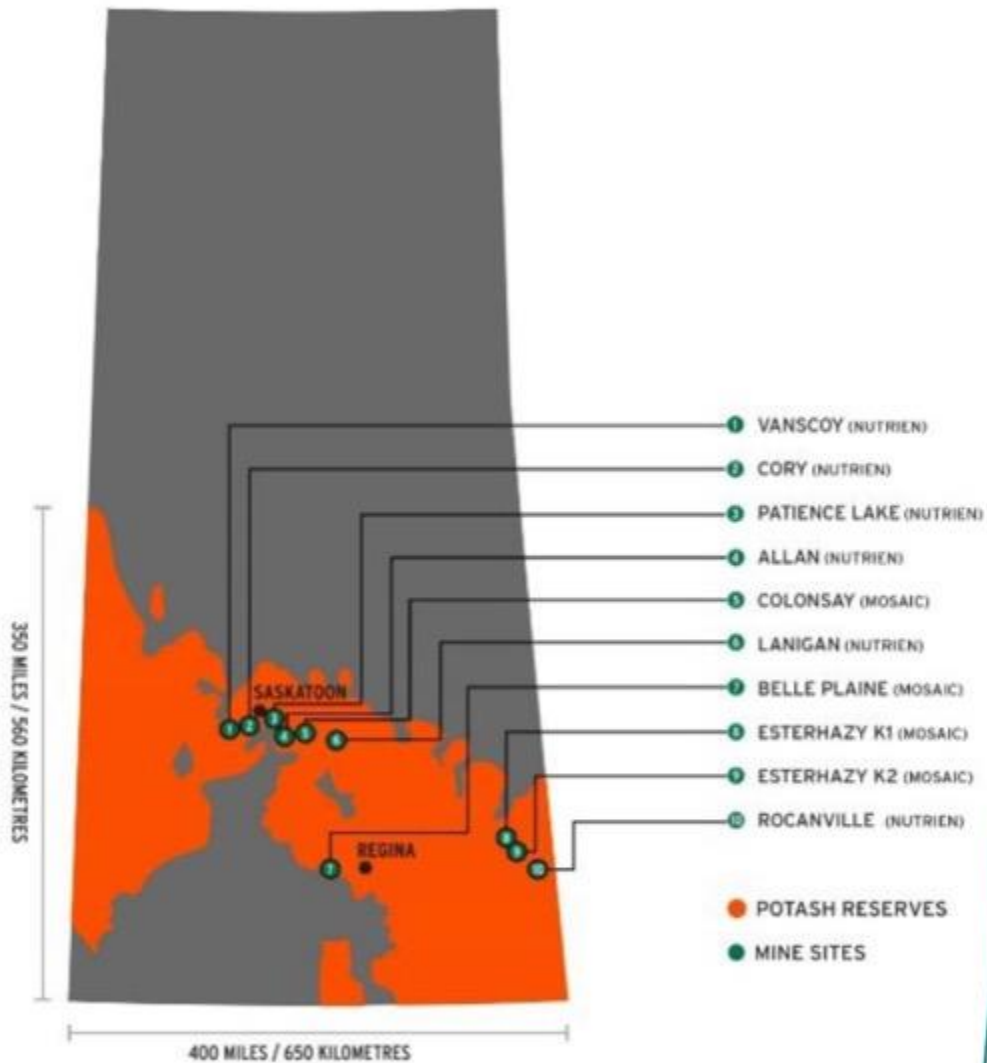
## Canpotex is the world's largest supplier of potash

# Canpotex Operations: Reliability.



- Providing logistics services to deliver shareholder potash to customers.
- Ensuring Quality Assurance throughout the supply chain.
- Ensuring Health, Safety & Environment throughout the supply chain.





Source: Mosaic and Nutrien

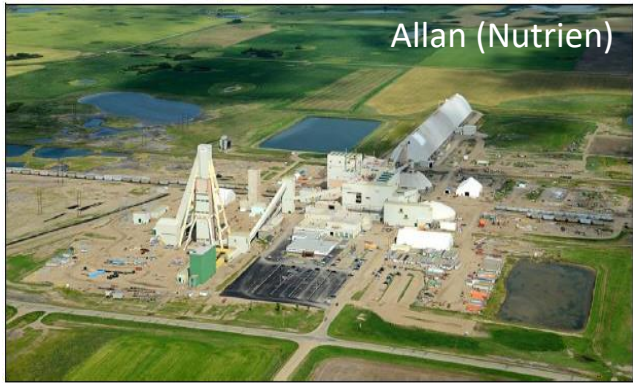
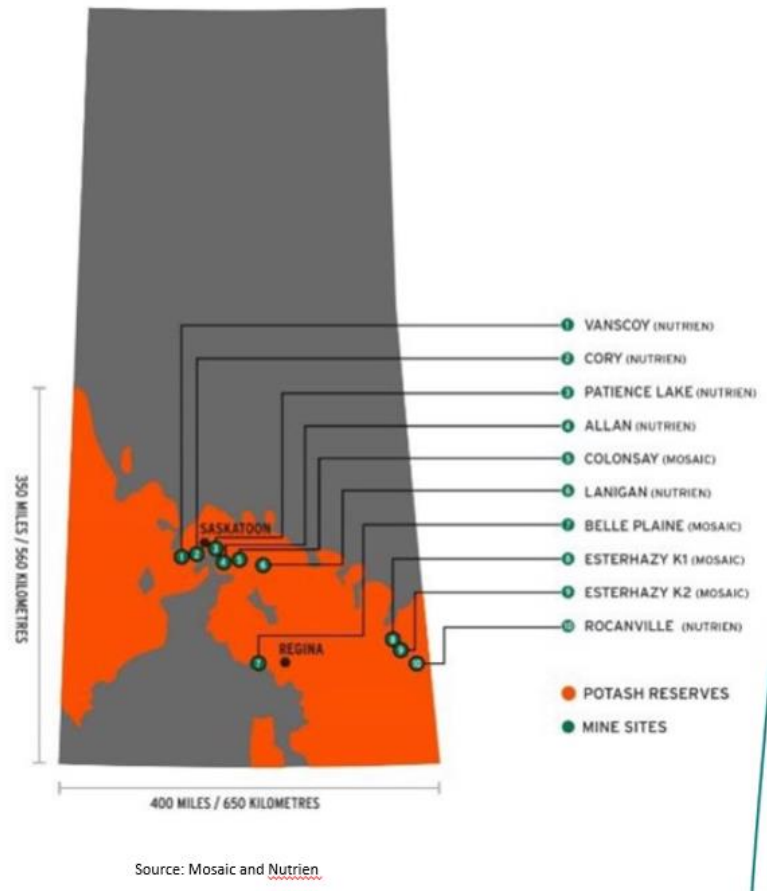
# Our potash

## Saskatchewan reserves are the richest in the world

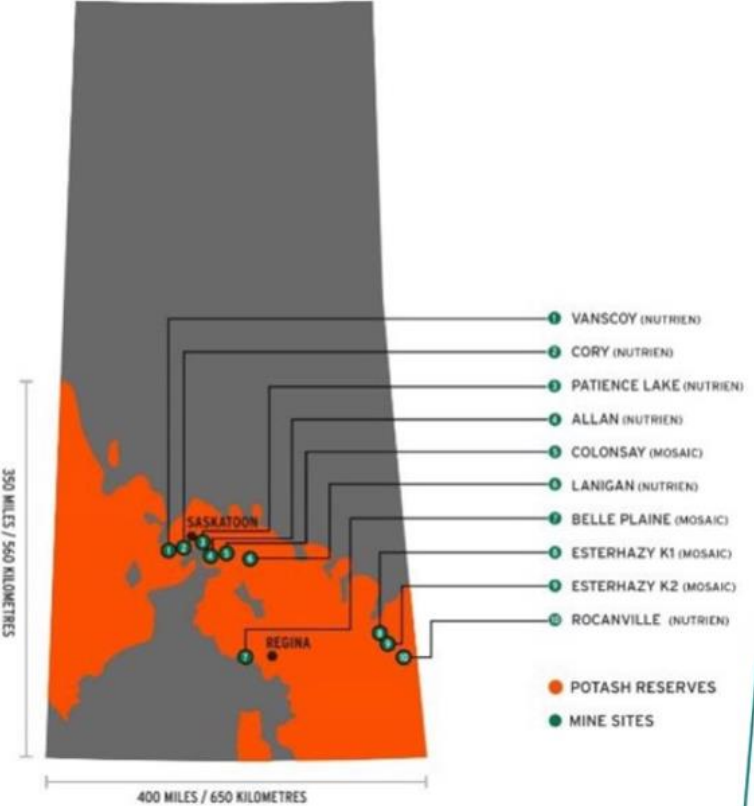
- Large and high-quality reserves
- 23% of world's accessible potash reserves are in Canada
- Canpotex sources product from Mosaic and Nutrien mines located in Saskatchewan



Source (Nutrien Sites)



Source (Mosaic Sites)



Source: Mosaic and Nutrien







Neptune Terminal



St. John Terminal



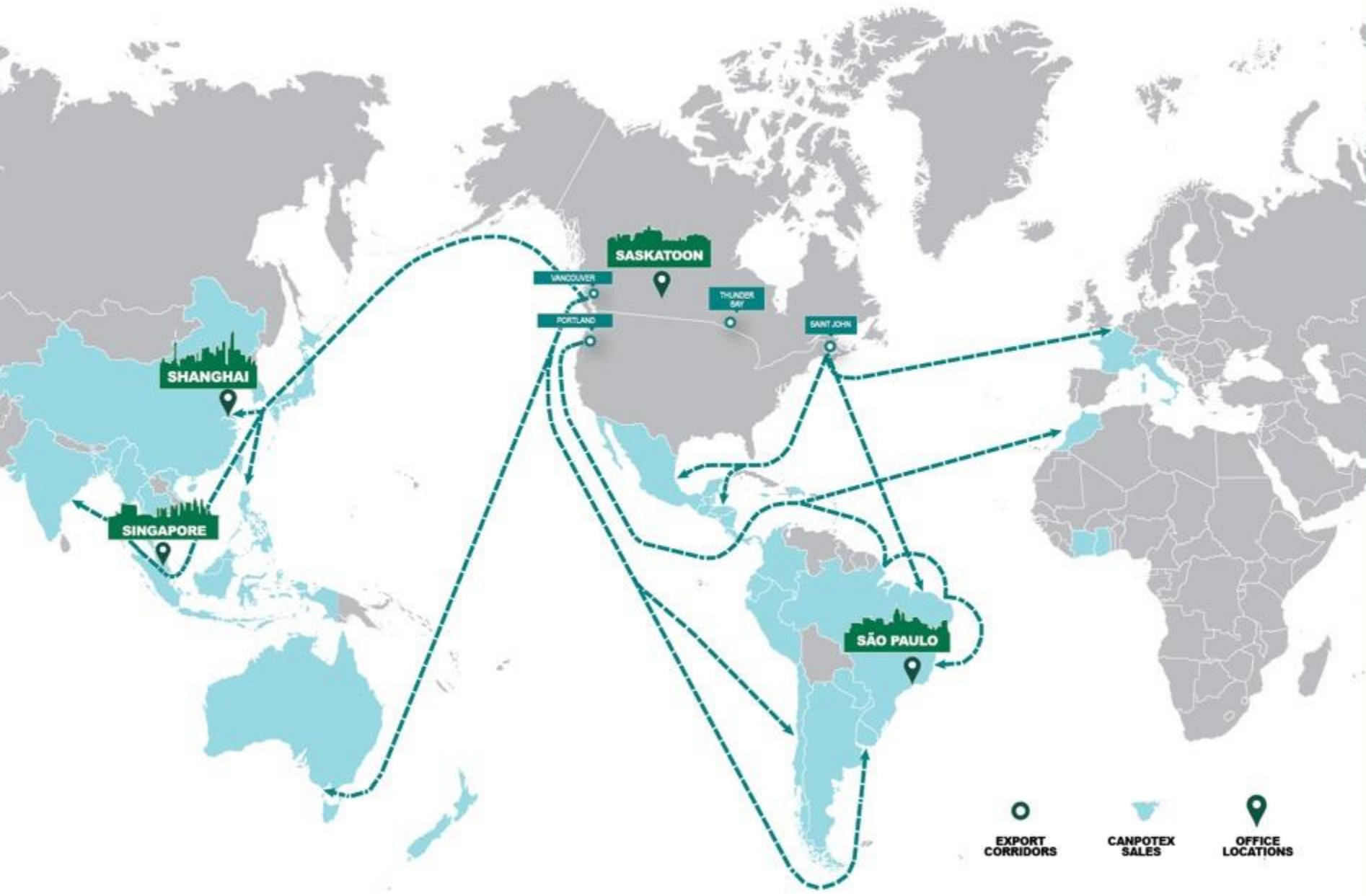
**Clean and modern vessels.**  
 Selected to optimize capacity, efficiency and safety.

PANAMAX		65 – 85 K
SUPRAMAX		50 – 65 K
HANDYMAX		40 – 50 K
HANDY		10 – 40 K



Thunder Bay Terminal





# Ocean transportation.

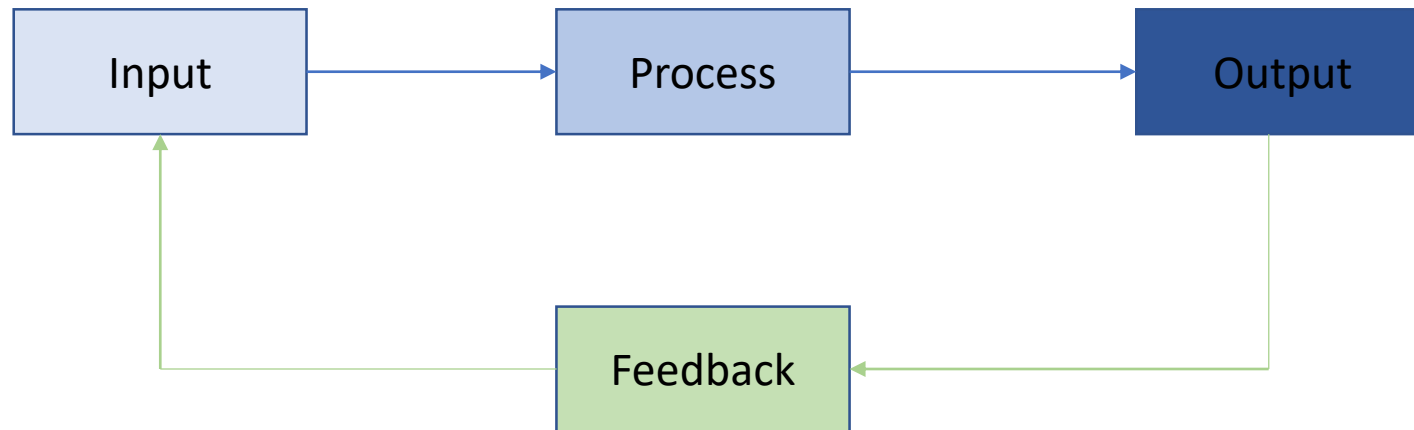
**~240** vessel voyages

**700+** port calls

**110+** ports worldwide



# How do you become Resilient:Innovation



- Constant re-evaluation of processes; Continuous Improvement Process or maybe Contingency in Planning.
- What are your inputs, processes, outputs, and how do you methodically make changes to make your SC more resilient.

# Major Risks to Supply Chain-Environmental Factors (Railways)



Flooding, Bonnybrook Rail Bridge, Calgary, June 2013



Ice Jam, Perth-Andover, Spring 2015

Examples of Impacts	Climate Factor(s)
1. <i>Flooding, wash-outs, and obstructions of railway tracks and embankments, bridges, and culverts, flooding of below-grade tunnels</i>	<ul style="list-style-type: none"> <li>• Extreme precipitation (heavy rainfall) and associated standing water, landslides, mudslides, rock slides, debris floods, ice-jam flooding</li> <li>• Storm surges/sea level rise in coastal areas</li> </ul>
2. <i>Rail bridge scour and damage to bridge structures from ice jams</i>	<ul style="list-style-type: none"> <li>• Extreme precipitation (heavy rainfall, flood induced erosion)</li> </ul>
3. <i>Buckling of rail tracks</i>	<ul style="list-style-type: none"> <li>• Permafrost thaw</li> <li>• Extreme heat or large temperature fluctuations</li> </ul>
4. <i>Broken rail tracks and equipment malfunctions and failures (may include broken wheels, reduced effectiveness of brakes, frozen switches)</i>	<ul style="list-style-type: none"> <li>• Extreme cold</li> </ul>
5. <i>Damage to signalization equipment, rail line obstruction (i.e. fallen power lines/trees), railcar blow-over</i>	<ul style="list-style-type: none"> <li>• High winds</li> <li>• Extreme precipitation</li> <li>• Freezing rain</li> </ul>

Source: Palko, K. and Lemmen, D.S. (Eds.). (2017). Climate risks and adaptation practices for the Canadian transportation sector 2016. Ottawa, ON: Government of Canada



# Major Risks to Supply Chain-Environmental Factors (Marine Transportation)



Examples of Impacts	Climate Factor(s)
<b>1. Flooding and/or damage to port facilities</b>	<ul style="list-style-type: none"> <li>• Extreme precipitation (heavy rainfall) and associated standing water</li> <li>• Storm surges/sea level rise, erosion in coastal areas</li> <li>• Freezing rain (ice-scour damage on dock structures and visual navigational aids)</li> <li>• Low water levels (damage and accelerated decay of exposed infrastructure)</li> </ul>
<b>2. Increased or reduced access to ports, dredging requirements</b>	<ul style="list-style-type: none"> <li>• Increasing sea levels (e.g., Atlantic Canada and British Columbia) permitting entry of heavier vessels (deeper drafts)</li> <li>• High water levels inhibiting passage of vessels under bridges</li> <li>• Decreasing sea levels (e.g., Hudson Bay) and lower freshwater levels (e.g., Great Lakes) inhibiting access by heavier vessels</li> </ul>
<b>3. Hazards to vessel navigation – storms and wind events (waves)</b>	<ul style="list-style-type: none"> <li>• Wave action (difficulty maneuvering vessels)</li> <li>• Melting sea ice (open water worsening the impact of storms and wind events)</li> </ul>
<b>4. Hazards to vessel navigation – detached sea ice</b>	<ul style="list-style-type: none"> <li>• Melting ice (detached sea ice moving into unexpected areas)</li> </ul>
<b>5. Longer or shorter shipping season</b>	<ul style="list-style-type: none"> <li>• Earlier ice break-up/later freeze-up (longer navigation season), later ice break-up/earlier freeze-up (shorter season)</li> </ul>
<b>6. New navigation opportunities</b>	<ul style="list-style-type: none"> <li>• Melting sea ice (creating open water where navigation was previously not possible)</li> </ul>

Source: Palko, K. and Lemmen, D.S. (Eds.). (2017). *Climate risks and adaptation practices for the Canadian transportation sector 2016*. Ottawa, ON: Government of Canada



[canpotex.com](https://canpotex.com)