Supplementary materials

Table S1. Three case studies across Canada, Mexico, and the United States.

Brief description
The 2016 Fort McMurray wildfire and flooding, Alberta, Canada The May 2016 Fort McMurray wildfire was first spotted on the afternoon of May 1st [40]. By May 3rd, the wildfire had significantly grown in size and winds drove the fire into the community of Fort McMurray. 88,000 people were evacuated from the region in a short period of time. Over the course of five weeks, the wildfire devastated 590,000 hectares of land and 2,000 structures in the region were either lost or destroyed [41]. The socio-economic impacts of the wildfires on Indigenous peoples in the Regional Municipality of Wood Buffalo extended far beyond direct damages [42]. Many factors hindered effective evacuation and response efforts. Among these factors included: lack of preparedness and centralized disaster planning, issues regarding jurisdiction and coordination, and the lack of culturally appropriate evacuation centers. The consequences of the wildfire continued to affect Indigenous communities years after. On July 30th, 2016, just weeks after residents returned to their communities as a result of the devastating wildfire, the city of Fort McMurray was struck by a flash flood after receiving up to 85 mm of rain [43]. The flood occurred at a time when Fort McMurray was undergoing recovery efforts in response to the May wildfires that caused the evacuation of the entire city [44]. Flooding caused losses to personal property, significant damages to approximately 41 homes, as well as disrupted local traffic and recovery efforts. The flash flood also caused road closures and knocked out power to traffic lights.
The 2013 La Montaña region landslide and flooding, State of Guerrero, Mexico La Montaña region is located in the Sierra Madre del Sur in Guerrero State, Mexico. It is home to the largest proportion of the state's Indigenous people (85% of the state's total), including three main ethnolinguistic groups: Nahuas, Mixtecos (na savi that means 'the people of the rain'), and Tlapanecos (me'phaa which means 'the one who is an inhabitant of Tlapa') [20]. La Montaña region is subject to geographical and hydrometeorological events that constantly modify it. One such event occurred due to the combination of Hurricanes Ingrid and Manuel in 2013, which first caused floods and then multiple landslides. On the morning of September 13, 2013, tropical depression No. 13 developed in the Pacific Ocean, beginning 170 km southwest of Técpan de Galeana, Guerrero, and eventually reached a maximum sustained wind speed of 55 km/h, with gusts up to 75 km/h. In the afternoon, the tropical depression developed into tropical storm Manuel, with maximum sustained winds of 75 km/h, gusts of 85 km/h, and displacement to the west-northwest at 9 km/h [45]. Likewise, Hurricane Ingrid simultaneously entered the Gulf of Mexico. The Ministry of the Interior (SEGOB) declared a disaster for the 81 municipalities of the state of Guerrero. Ultimately, the interaction of these two storm systems would cause one of the greatest disasters of the contemporary era of the state and Mexico [21].
The 2016 Louisiana and Texas flooding, the United States In 2016, Louisiana experienced two of the four most expensive and nationally ranked floods of the year [46]. A heavy rainfall event carrying tropical moisture developed on March 8th, producing cumulative rainfall amounts of 250-500 mm across East Texas and much of inland Louisiana over a four-day period [47-48]. In Louisiana, flooding impacted 36 parishes (counties) in the northern and central region of the state where large agricultural and industrial

economic centers are located [49]. The heavy rains caused unprecedented flooding and extensive damages to the Jena Band of Choctaw Indians reservation. The flooding adversely impacted 11 Tribal households and 37 individual Tribal members and resulted in damages to homes, loss of property, and displacement of families to temporary shelters and housing [50].

In August, a second unnamed low-pressure storm system stalled over the southern region of Louisiana and caused historic levels of precipitation, nearly three times that of Hurricane Katrina in 2005 [51]. The flooding resulted in 13 deaths, over 30,000 rescued individuals, and more than 8,000 individuals displaced to shelters [51].

Table S2. Data processing and analysis across Canada, Mexico, and the United States.

Canada
The spatial resolution of data for the methodology was at the secondary administrative level. Data obtained from Canada's CatIQ were at the provincial (primary subnational administrative) level. Thus, we used the following population-based weighting method to estimate flood economic costs at the municipal level in Canada: ● Sum the total population living in the municipalities affected by the particular flood events; ● Calculate the percentage of the total population of municipalities affected by flood events; and Weight flood economic costs by municipality based on the percentage of the population affected.[1]
Mexico
Flood cost data were obtained from CENAPRED. The method of collecting damages and losses, cost of emergency care and other aspects, was carried out by specific personnel of each Mexican state agency in charge of each type of infrastructure, by filling in specific official forms required to request a declaration of disaster to the Disaster Fund (Fondo de Desastres Naturales, FONDEN). Thus, each agency received economic resources almost immediately, for the recovery of the affected area. Agency personnel visited the damage sites and gathered primary information to describe impacts (e.g., observations, photographs, geo-location data) and estimate the economic cost required for complete reconstruction. Subsequently, CENAPRED staff compiled the data for each item, across all responsible agencies, and generated the total cost of the disaster at the state and federal levels. Data were aggregated at the municipal level for each agency responsible for infrastructure. Data on the effects that were not subject to financial support from FONDEN, for example, rural roads and bridges, were also compiled. In some cases, data from the private insurance sector were integrated.
The United States
We used the NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters 1980-2020 (NCEI 2020) to identify major flood events that occurred in the United States between 2013 and 2017. We then cross-referenced the billion-dollar flood disaster events with the list of disaster declarations provided by FEMA's National Emergency Management Information System (NEMIS) to identify the counties involved in each flood disaster event. Each flood event and the affected counties were also linked to the NEMIS-designated disaster number. We then referenced the flood disaster numbers to identify the damages and losses in the datasets and ensure that the data were connected to the same flood

[1] Taking the July 2013 Toronto flooding as an example, this event affected three census divisions (Toronto, Peel Region, and York Region). The total population for these regions was 5,223,219, according to the 2016 Census Program, Statistic Canada. For each census division, we calculated the population percentage of the total population, e.g., Toronto (52.30%), Peel Region (26.45%), and York Region (21.25%). Then, dwelling damage (as an example) for each census division was computed by multiplying the total dwelling damage by the individual census division population percentage of the total population.

event in each state and county. For datasets that did not reference the flood disaster number, we identified and connected flood economic cost damage and loss data by referencing the date(s) of the disaster, the type and/or description of the event, and the counties of occurrence, as provided by FEMA, NOAA, and NEMIS. We then sorted and aggregated data within each dataset by event, county, and damage and loss category and applied to the appropriate damage and loss indicator.