Greece

	AFFECTED BY 100-YEAR FLOOD	AFFECTED BY 250-YEAR EARTHQUAKE	CAPITAL LOSS FROM 250-YEAR EARTHQUAKE
GDP $192 billion*	$3 billion (1%)	$90 billion (47%)	$20 billion (8%)
Population 10.8 million*	200,000 (2%)	4 million (36%)	2,000 (<1%)

*2015 estimates

Greece's population and economy are exposed to earthquakes and floods, with earthquakes posing the greater risk of a high impact, lower probability event. The model results for present-day risk shown in this risk profile are based on population and gross domestic product (GDP) estimates for 2015. The estimated damage caused by historical events is inflated to 2015 US dollars.

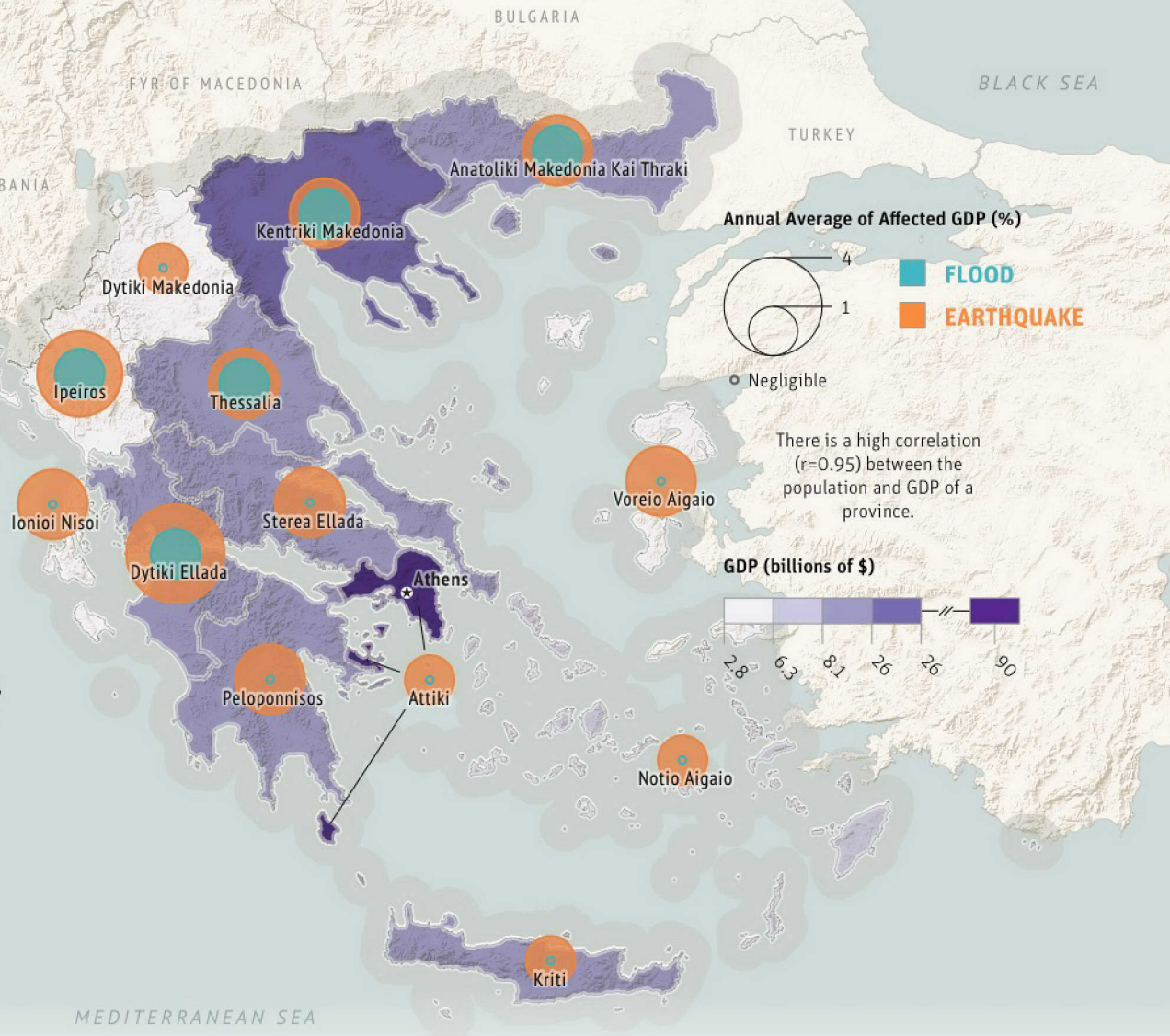
Just over 60 percent of Greece's population lives in urban environments. The country's GDP was approximately US$192 billion in 2015, with close to 80 percent derived from services, most of the remainder generated by industry, and agriculture making a small contribution. Greece's per capita GDP was $17,800.

This map displays GDP by province in Greece, with greater color saturation indicating greater GDP within a province. The blue circles indicate the risk of experiencing floods and the orange circles the risk of earthquakes in terms of normalized annual average of affected GDP. The largest circles represent the greatest normalized risk. The risk is estimated using flood and earthquake risk models.

The table displays the provinces at greatest normalized risk for each peril. In relative terms, as shown in the table, the province at greatest risk of floods is Anatoliki Makedonia, and the one at greatest risk of earthquake is Dytiki Ellada. In absolute terms, the province at greatest risk of floods is Kentriki Makedonia, and the one at greatest risk of earthquake is Attiki.

TOP AFFECTED PROVINCES

FLOOD ANNUAL AVERAGE OF AFFECTED GDP (%)		EARTHQUAKE ANNUAL AVERAGE OF AFFECTED GDP (%)	
Anatoliki Makedonia Kai Thraki	1	Dytiki Ellada	4
Thessalia	1	Ipeiros	3
Ipeiros	1	Voreio Aigaio	2
Kentriki Makedonia	1	Ionioi Nisoi	2
Dytiki Ellada	1	Kentriki Makedonia	2
Peloponnisos	0	Anatoliki Makedonia Kai Thraki	2
Dytiki Makedonia	0	Sterea Ellada	2
Sterea Ellada	0	Thessalia	2
Attiki	0	Peloponnisos	2
Ionioi Nisoi	0	Attiki	1



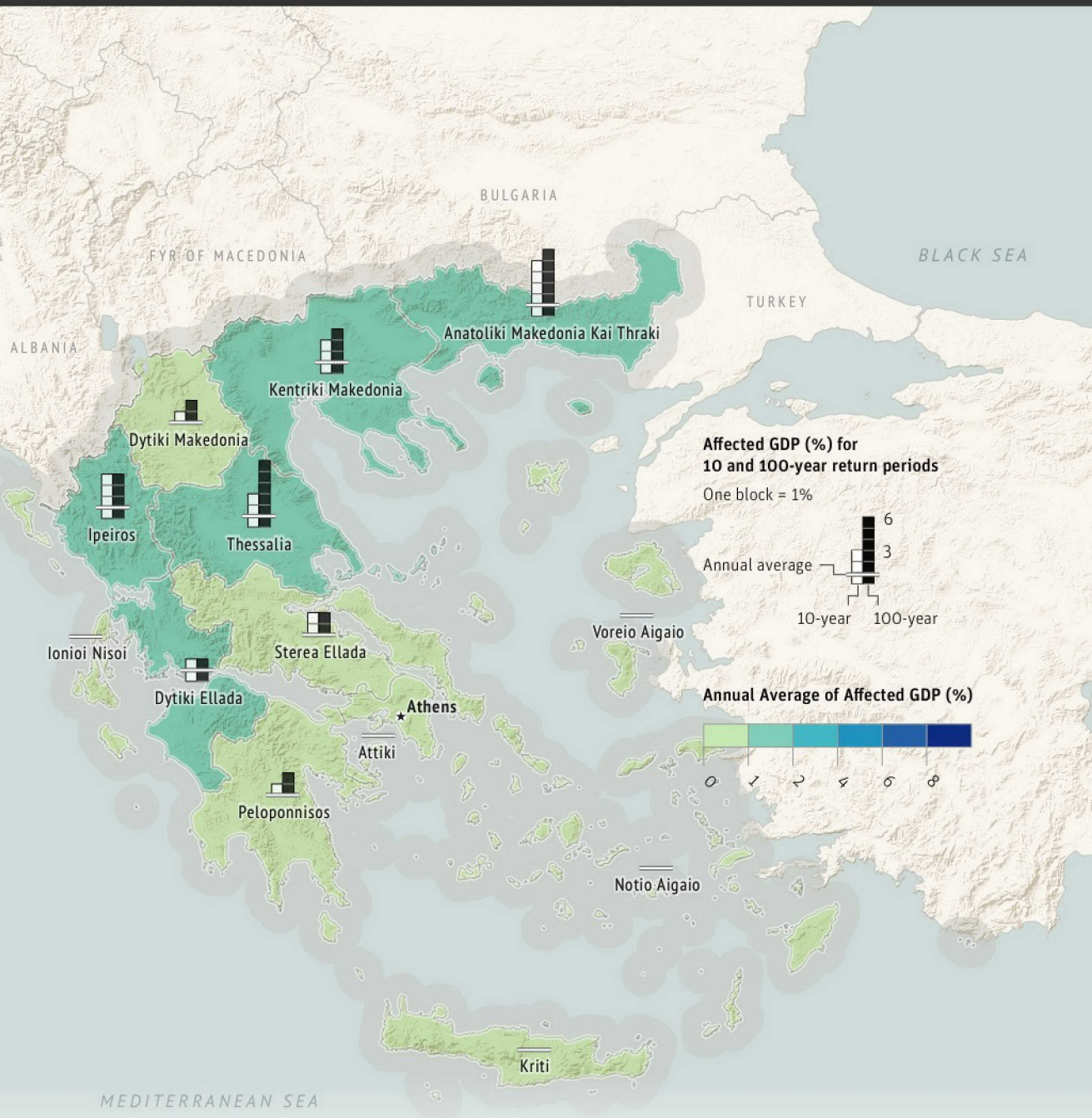
The most damaging floods in Greece since 1900 occurred in 1994 and 2003, causing over $700 million and $800 million in damage, respectively.

This map depicts the impact of flooding on provinces' GDPs, represented as percentages of their annual average GDPs affected, with greater color saturation indicating higher percentages. The bar graphs represent GDP affected by floods with return periods of 10 years (white) and 100 years (black). The horizontal line across the bars also shows the annual average of GDP affected by floods.

When a flood has a 10-year return period, it means the probability of occurrence of a flood of that magnitude or greater is 10 percent per year. A 100-year flood has a probability of occurrence of 1 percent per year. This means that over a long period of time, a flood of that magnitude will, on average, occur once every 100 years. It does not mean a 100-year flood will occur exactly once every 100 years. In fact, it is possible for a flood of any return period to occur more than once in the same year, or to appear in consecutive years, or not to happen at all over a long period of time.

If the 10- and 100-year bars are the same height, then the impact of a 10-year event is as large as that of a 100-year event, and the annual average of affected GDP is dominated by events that happen relatively frequently. If the impact of a 100-year event is much greater than that of a 10-year event, then less frequent events make a larger contribution to the annual average of affected GDP. Thus, even if a province's annual affected GDP seems small, less frequent and more intense events can still have large impacts.

The annual average population affected by flooding in Greece is about 50,000 and the annual average affected GDP about $600 million. Within the various provinces, the 10- and 100-year impacts do not differ much, so relatively frequent floods have large impacts on these averages.



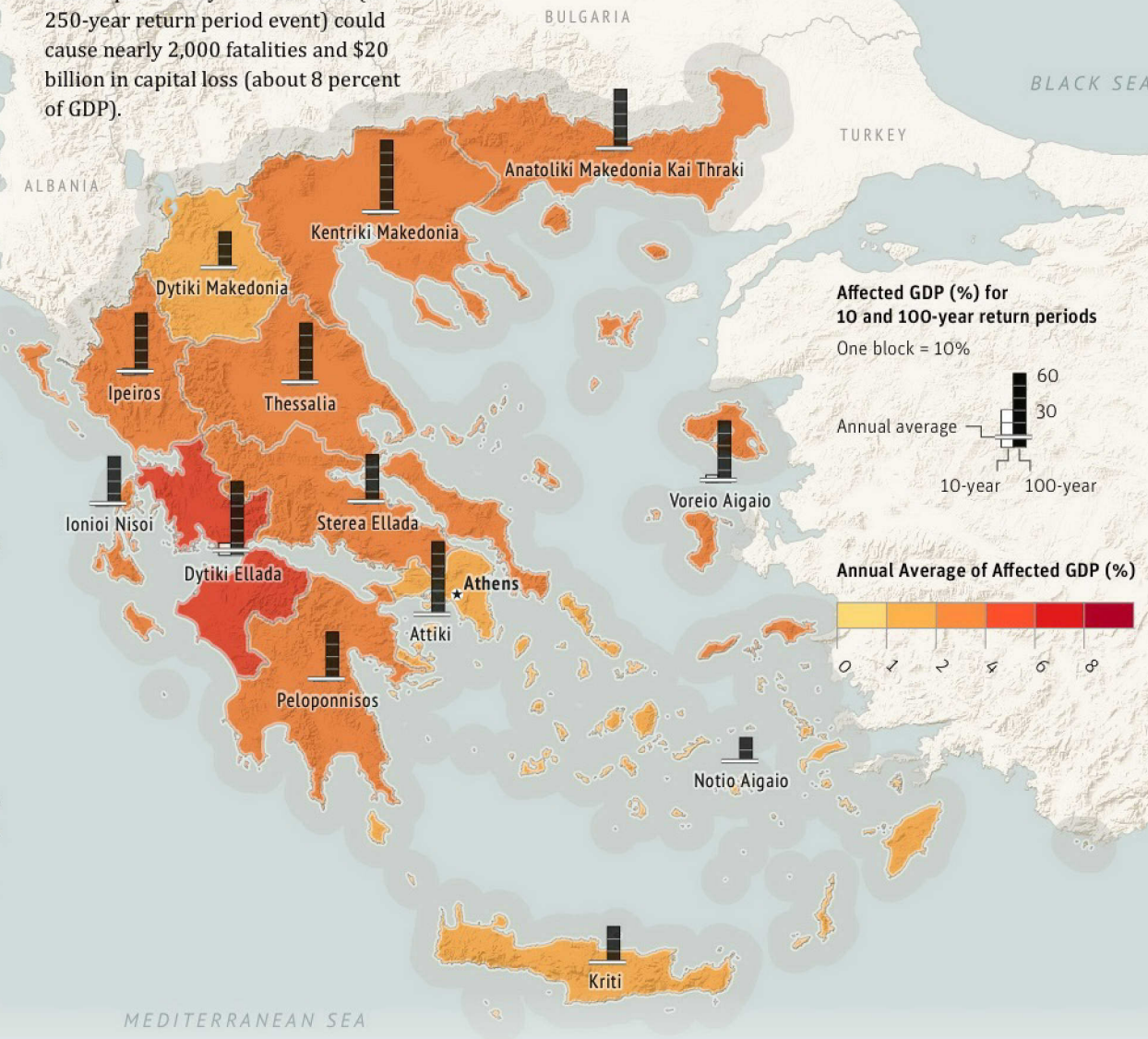
Greece's worst earthquake since 1900, with a magnitude of 7.2, took place in 1953 in Kefalonia and caused over 450 fatalities. Many people left the island after the event, reducing its population to a mere 20 percent of its size before the disaster. The same region was also hit by earthquakes in 1867 and 2011. A 1999 earthquake in Athens caused close to 150 deaths and over $6 billion in damage. More recently, in 2014, an earthquake in southern Greece caused three fatalities and almost $500 million in damage.

This map depicts the impact of earthquakes on provinces' GDPs, represented as percentages of their annual average GDPs affected, with greater color saturation indicating higher percentages. The bar graphs represent GDP affected by earthquakes with return periods of 10 years (white) and 100 years (black). The horizontal line across the bars also shows the annual average of GDP affected by earthquakes.

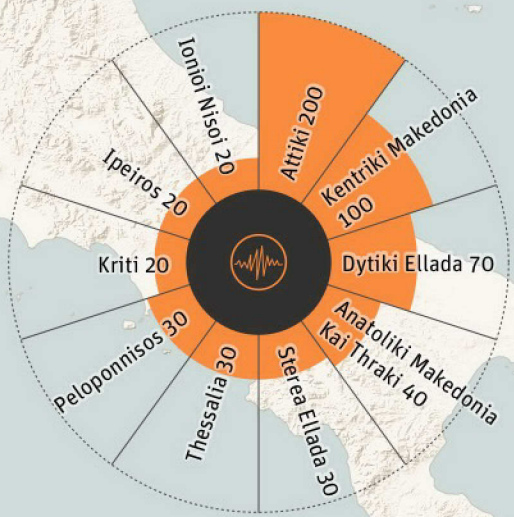
When an earthquake has a 10-year return period, it means the probability of occurrence of an earthquake of that magnitude or greater is 10 percent per year. A 100-year earthquake has a probability of occurrence of 1 percent per year. This means that over a long period of time, an earthquake of that magnitude will, on average, occur once every 100 years. It does not mean a 100-year earthquake will occur exactly once every 100 years. In fact, it is possible for an earthquake of any return period to occur more than once in the same year, or to appear in consecutive years, or not to happen at all over a long period of time.

If the 10- and 100-year bars are the same height, then the impact of a 10-year event is as large as that of a 100-year event, and the annual average of affected GDP is dominated by events that happen relatively frequently. If the impact of a 100-year event is much greater than that of a 10-year event, then less frequent events make larger contributions to the annual average of affected GDP. Thus, even if a province's annual affected GDP seems small, less frequent and more intense events can still have large impacts.

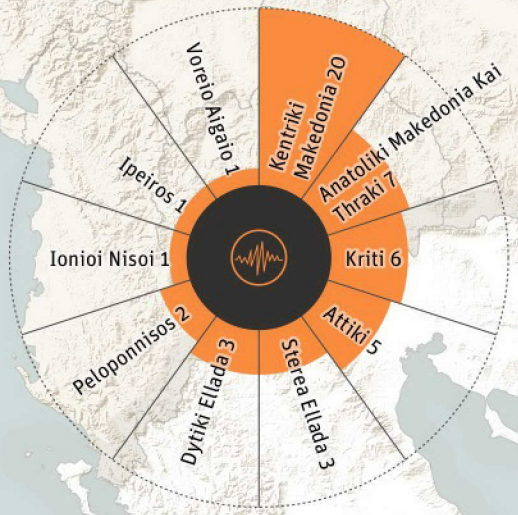
The annual average population affected by earthquakes in Greece is about 200,000 and the annual average affected GDP about $3 billion. The annual averages of fatalities and capital losses caused by earthquakes are about 50 and about $700 million, respectively. The fatalities and capital losses caused by more intense, less frequent events can be substantially larger than the annual averages. For example, an earthquake with a 0.4 percent annual probability of occurrence (a 250-year return period event) could cause nearly 2,000 fatalities and $20 billion in capital loss (about 8 percent of GDP).



EARTHQUAKE
ANNUAL AVERAGE CAPITAL LOSS (MILLIONS $)

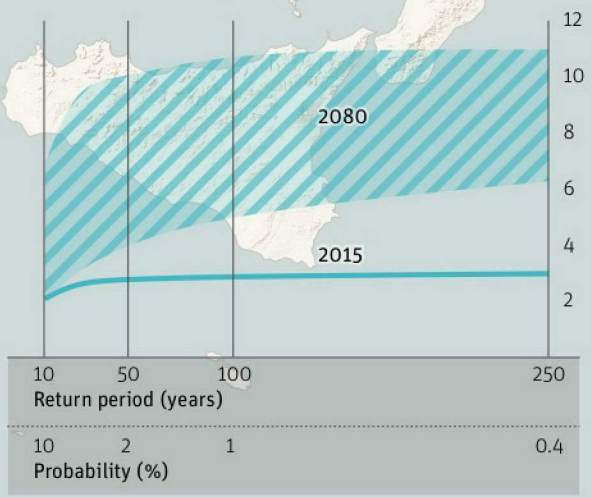


EARTHQUAKE
ANNUAL AVERAGE FATALITIES

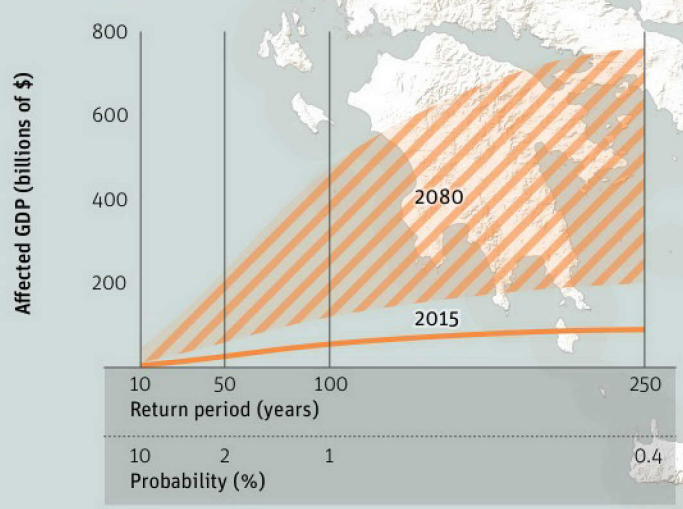


The rose diagrams show the provinces with the potential for greatest annual average capital losses and highest annual average numbers of fatalities, as determined using an earthquake risk model. The potential for greatest capital loss occurs in Attiki, which is not surprising, given the economic importance of the province.

FLOOD
EXCEEDANCE PROBABILITY CURVE, 2015 AND 2080



EARTHQUAKE
EXCEEDANCE PROBABILITY CURVE, 2015 AND 2080



The exceedance probability curves display the GDP affected by, respectively, floods and earthquakes for varying probabilities of occurrence. Values for two different time periods are shown. A solid line depicts the affected GDP for 2015 conditions. A diagonally striped band depicts the range of affected GDP based on a selection of climate and socioeconomic scenarios for 2080. For example, if Greece had experienced a 100-year return period flood event in 2015, the affected GDP would have been an estimated $3 billion. In 2080, however, the affected GDP from the same type of event would range from about $5 billion to about $10 billion. If Greece had experienced a 250-year earthquake event in 2015, the affected GDP would have been about $90 billion. In 2080, the affected GDP from the same type of event would range from about $200 billion to about $800 billion, due to population growth, urbanization, and the increase in exposed assets.

All historical data on floods and earthquakes are from D. Guha-Sapir, R. Below, and Ph. Hoyois, EM-DAT: International Disaster Database (Université Catholique de Louvain, Brussels, Belgium), www.emdat.be; the National Geophysical Data Center/World Data Service (NGDC/WDS), Significant Earthquake Database (National Geophysical Data Center, NOAA), doi:10.7289/V5TD9V7K; and J. Daniell and A. Schaefer, "Eastern Europe and Central Asia Region Earthquake Risk Assessment Country and Province Profiling," final report to GFDRR, 2014. Damage estimates for all historical events have been inflated to 2015 US$.