

ATM 200

Natural Disasters

Lecture 1

Ch 1 – Natural Disasters and the Human Population

Text Source Today:
Chapter 1

1.1: AATM 200 Natural Disasters Intro – Ch. 1

- ♦ **Hazards** are situations (**natural or man-made**) which pose a level of threat to life, health, property, or environment.
- ♦ **Geohazards** are **natural earth processes** that release large amounts of **energy**, involving the lithosphere, hydrosphere and/or atmosphere.
- ♦ **Natural Disasters** are **geohazards** that interact with **human activity** causing a tragic loss of life and property; *disasters occur when hazards meet vulnerability (i.e., risk).* Thus, a natural hazard will never result in a natural disaster in areas without **vulnerability (e.g., a strong earthquake in an uninhabited area).**

U.S. Federal Government (FEMA) Identified Hazards:

Chemical Emergencies	Nuclear Power Plant Emergency
Dam Failure	Terrorism
Earthquakes	Thunderstorms
Extreme Heat	Tornadoes
Fire	Tsunami
Floods	Volcanoes
Hazardous Materials	Wildfires
Hurricanes	Winter Storms
Landslides/Avalanches	

- **Without the human element, there would be no natural disasters!**

♦ **Why is the human element so critical?**

- **population increase**
- more people living in **hazard-prone areas**
- populations are becoming more **hyper-concentrated**
 - there are over **7 billion** people on Earth (with a net increase of **~2.5** people/sec)
 - **47%** live in urban environments
 - by 2040, there will be closer to **9 billion** people, with nearly **two-thirds in cities**
 - of those cities, **40%** are on a **coastline**, making them prone to hurricanes and tsunami damage
 - **a large majority of cities** are in areas subject to other natural hazards (volcanoes, earthquakes, floods, etc.)

♦ **The all-time deadliest natural disasters on record (excluding famines and contractible diseases):**

<u>Fatalities</u>	<u>Date</u>	<u>Event</u>	<u>Country</u>
~2-4 million	1931	Floods (all major rivers)	China
~1-2 million	1887	Floods (Yellow River)	China
830,000+	1556	Earthquake (Shaanxi)	China
500,000+	1970	Hurricane (Bhola)	Bangladesh
300,000+	1839	Hurricane (Coringa)	India
300,000+	1881	Hurricane (Haiphong)	Vietnam
300,000+	1737	Hurricane (Calcutta)	India
255,000+	1976	Earthquake (Tangshan)	China
250,000+	526	Earthquake (Antioch)	Turkey
245,000+	2004	Earthquake/Tsunami	Indian Ocean
235,000+	1920	Earthquake (Gansu)	China
230,000+	1138	Earthquake (Aleppo)	Syria
230,000+	2010	Earthquake (Haiti)	Haiti

♦ **The deadliest natural disasters since 1970:**

<u>Fatalities</u>	<u>Date</u>	<u>Event</u>	<u>Country</u>
300,000+	1970	Hurricane (Bhola)	Bangladesh
255,000+	1976	Earthquake (Tangshan)	China
245,000+	2004	Earthquake/Tsunami	Indian Ocean
230,000+	2010	Earthquake (Haiti)	Haiti
140,000+	2008	Hurricane (Nargis)	Myanmar
140,000+	1991	Hurricane (Gorky)	Bangladesh
88,000+	2005	Earthquake (Kashmir)	Pakistan
87,500+	2008	Earthquake (Sichuan)	China
66,000+	1970	Earthquake/Landslides	Peru
55,630	2010	Heat Wave/Wildfire	Russia
50,000+	1990	Earthquake (Gilan)	Iran
35,000+	2003	Heat Wave	Europe
27,000+	2003	Earthquake (Bam)	Iran

♦ **Mitigation:** the process of making plans and taking action to **eliminate or reduce the threat** of future death and destruction when natural hazards suddenly become great threats; actions taken may be **engineering, physical, social or political**.

♦ **What can we do?**

- we cannot stop the **natural processes**
- we cannot stop the **population growth**
- we must try to **reduce (mitigate)** the hazards through:
 - **scientific study**
 - **population education**
 - **changes in engineering/building practices**
 - **development of management plans and hazard response scenarios**