Chapter 7 Highlights

1. There are many different types of floods. Greatest attention is often paid to fluvial and coastal flooding, but ***pluvial***, ***lacustrine***, flash, toxic, and urban flooding are also important, as are ***debris flows***.
2. Flooding is often ecologically beneficial and can provide significant ecosystem services to society, but can also cause great damage.
3. The physical flood ***hazard*** is increasing in many places due to climate change and land-use change, but the primary driver of increased flood damage over the last several decades is increased ***exposure*** (more people living in flood zones).
4. Flood exposure is not evenly distributed; poorer communities and communities of color are more likely to suffer from flooding.
5. Many rivers have been extensively modified for flood control using channelization, dams, and ***levees***. Levees have several major drawbacks: they cause ecological and social damage by cutting off rivers from their floodplains; they increase water levels in upstream and downstream reaches (leading to a ***levee arms race***); and they encourage development in flood-prone areas by providing the illusion of dryness (***the levee effect***).
6. The hard-path approach to flood management—massive engineering projects designed to keep the river in its channel—is slowly being replaced with an approach that focuses more on slowing water down on its way to the river, providing room for the river to overflow, and managing risk by reducing exposure.
7. ***Benefit-cost analysis*** is meant to provide an objective measure of whether a given flood-control (or other) project makes sense, but often ends up undervaluing ecosystems and favoring special interests over the public good.
8. Because of problems of information, incentives, and scales, we are continuing to build in flood-prone areas, increasing our exposure to future floods. The National Flood Insurance Program (NFIP), which was meant to reduce exposure, has instead increased it by subsidizing (re)building in flood zones.
9. New models provide better data on flood risk, which can help individuals and government agencies make better decisions.
10. Efforts at ***managed retreat*** from flood-prone areas (sometimes using ***setback levees***) face financial, logistical, and equity problems, but are having some success in reducing exposure, providing space for floodwaters, and re-connecting rivers with their floodplains.