8 October 2013

Dear Ashland Planning Commission
I am providing written and verbal comments today about the proposed Normal Avenue development. I want to first mention that I fully support infill to prevent sprawl. I applaud the Planning Commission's diligence in meeting the city of Ashland's goals to provide affordable housing for residents while honoring the city boundaries.

I am concerned about the proposed construction of so many units in such a delicate and vulnerable area, however, and feel that just because the property is within city limits does not automatically make it a desirable place to build.

My job is to help cities prepare for the impacts of climate change. I have worked for the communities of San Luis Obispo, Fresno, Missoula and Fort Collins, Colorado. I am currently helping Fort Collins city planners, just like yourselves, identify where residents are most vulnerable to climate change impacts and develop strategies to reduce their vulnerability. Fort Collins has had 2 recent wake-up calls to the impacts of climate change – the first was when school was cancelled city-wide due to heat (rather than snow) and the second was the devastating 1000-year floods they experienced just a month ago.

Climate change is expected to lead to more extreme events – more heat waves, droughts, catastrophic wildfires, and floods. I have looked closely at the models for southern Oregon and there is a clear signal of increasing potential for large winter storms for this area.

With this new knowledge of increasing flood risk related to climate change, it is no longer responsible to build in areas where we once considered building. We need to reduce the risk to people in flood zones. Unfortunately, the people most at risk during floods are usually those with the lowest incomes and least ability to respond or bounce back.

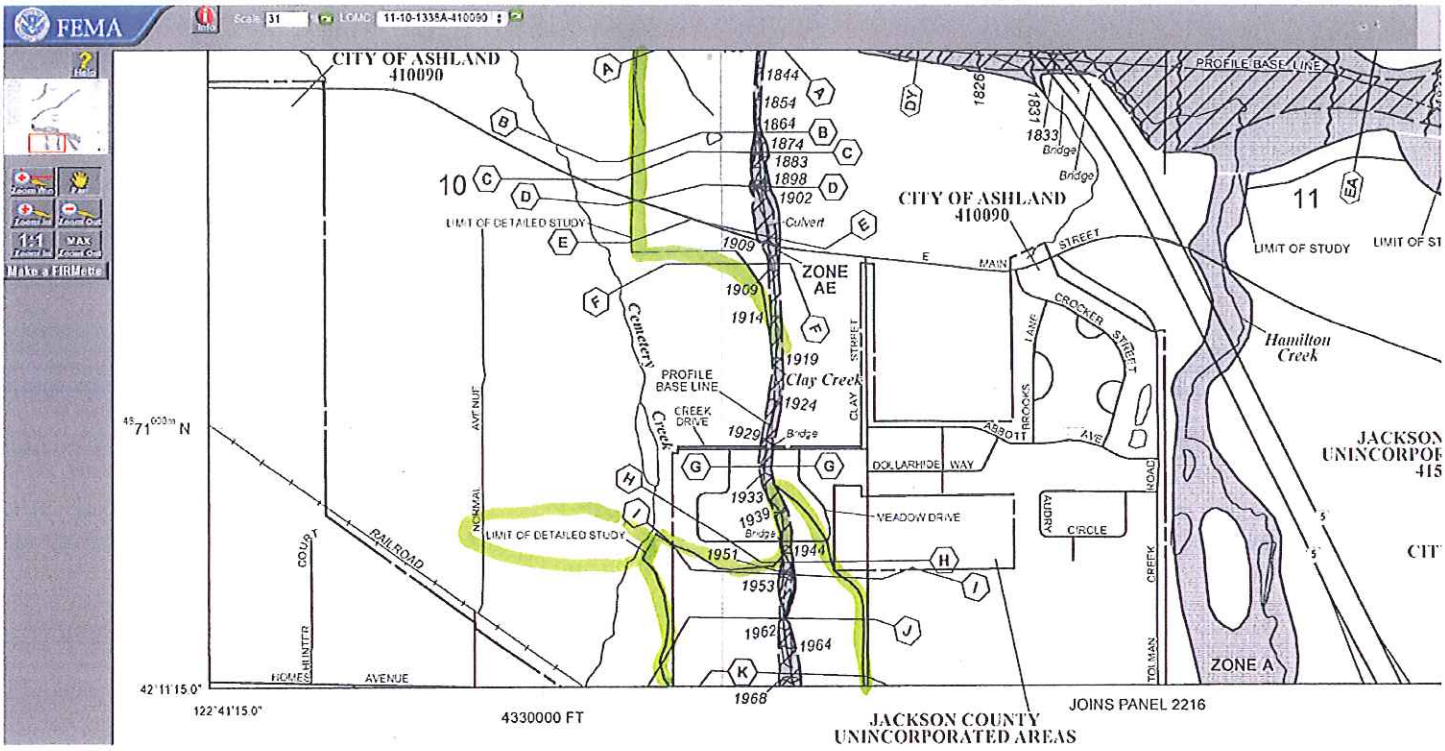
I looked at the FEMA flood maps for the Normal Ave. planned development, which is immediately next to the Clay St. development. The Clay St. development is mostly in a Moderate Risk area for flooding, which FEMA defines as between the 100-year and 500-year flood risk zones. Parts of it (especially the trailer park) are in the High risk area as well, which is within the 100-year floodway. The Normal Ave. development area was not studied by FEMA, but is adjacent to it and has similar features, including streams and wetlands that are of similar size and volume of water.

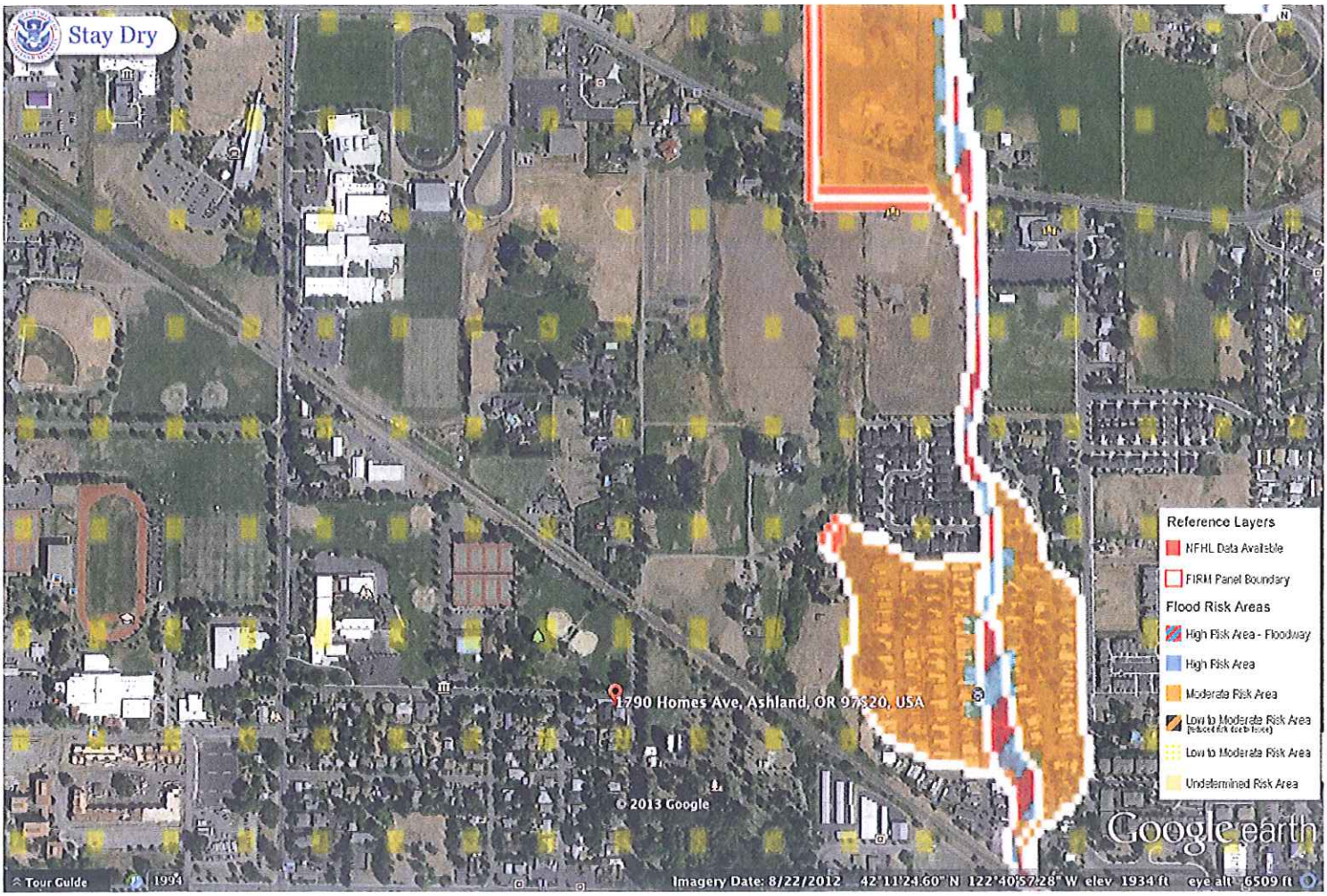
This shows that the area is currently at risk, but we need to remember that climate change presents us with even greater risk to consider. Climate change is expected to increase substantially in the coming decades, with greater and greater risk of floods, drought, and wildfire. Planning for resilient communities means thinking ahead and keeping people out of hazardous areas now, to reduce their vulnerabilities during future disasters.

While I support infill, I cannot support this project. The area is perfect for a park with natural vegetation and trails that can be used by the schools nearby and local kids.

Thank you,
Marni Koopman, Climate Change Scientist
Ashland Resident (1790 Homes Ave.)

3 attachments: (1) Excerpts from the Climate Resilient Communities Primer, (2) FEMA Maps of the proposed Normal Ave. development area, and (3) pictures of Colorado floods.





Figures 1 and 2. These maps are from the FEMA Flood Hazard mapping website (msc.fema.gov). The top map shows the boundaries of the area where FEMA completed their detailed study. The bottom map shows that the areas that were studied all showed up as high and moderate risk for flooding. The areas that were outside the study boundary were not classified. These maps were accessed 10-7-2013. Of note is that fact that the Clay St. development is at moderate to high risk, and is similar to the proposed Normal St. development. FEMA defines moderate risk as "between the limits of 100-year and 500-year floods."

Figures 3 and 4. Areas of Lyons Colorado where homes built near local creeks were flooded in September, 2013.

Climate Resilient Cities

A Primer on Reducing Vulnerabilities to Disasters

Neeraj Prasad – Federica Ranghieri – Fatima Shah
Zoe Trohanis – Earl Kessler – Ravi Sinha

THE WORLD BANK

TABLE 1.1 / Possible impacts of extreme climate change relevant to urban areas (mostly adverse in East Asia)

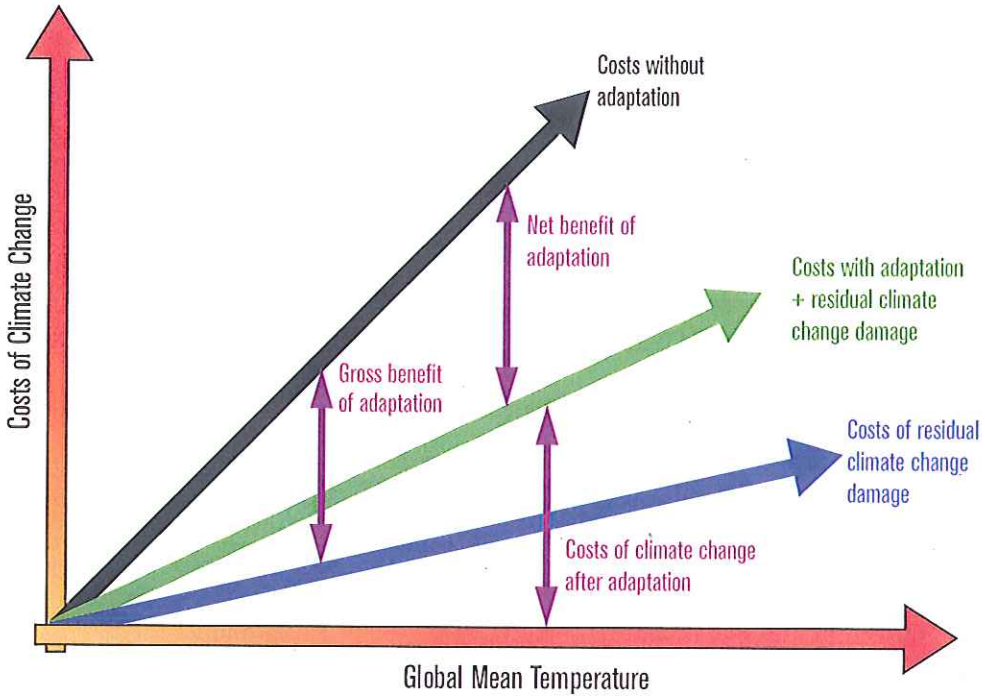
Source: IPCC, *Synthesis Report – Summary for Policymakers*. Assessment of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC: Cambridge University Press, 2007).

Projected change in extreme climate phenomena and their likelihood	Consequences of climate change
Warmer with fewer cold days and nights, warmer and more frequent hot days and nights (virtually certain)	◻ Heat island effect ◻ Increased demand for cooling ◻ Declining air quality in cities ◻ Effects on winter tourism ◻ Reduced energy demand for heating (a short-term benefit but not in East Asia) ◻ Reduced disruption to transport due to snow, ice (a short-term benefit, but not in East Asia)
Warm spells/heat waves. Frequency increases over most land areas (very likely)	◻ Increased water demand ◻ Water quality problems ◻ Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and socially isolated ◻ Reduction in quality of life for people in warm areas without appropriate housing
Heavy precipitation events. Frequency increases over most areas (very likely)	◻ Adverse effects on quality of surface and groundwater ◻ Contamination of water supply ◻ Increased risk of deaths, injuries, and infectious, respiratory, and skin diseases ◻ Disruption of settlements, commerce, transport, and societies due to flooding ◻ Large displacement of people ◻ Pressures on urban and rural infrastructures ◻ Loss of property ◻ Water stress may be relieved (short-term benefit)
Intense tropical cyclone activity increases (likely)	◻ Power outages ◻ Distress migration to urban areas ◻ Disruption of public water supply ◻ Increased risk of deaths, injuries, water and food-borne diseases; post-traumatic stress disorders ◻ Disruption by flood and high winds ◻ Withdrawal of risk coverage in vulnerable areas by private insurers ◻ Potential for population migrations ◻ Loss of property
Increased incidence of extreme high sea level (excludes tsunamis) (likely)	◻ Decreased freshwater availability due to saltwater intrusion ◻ Increased risk of deaths and injuries by drowning in floods and migration-related health effects ◻ Loss of property and livelihood ◻ Permanent erosion and submersion of land ◻ Costs of coastal protection versus costs of land-use relocation ◻ Potential for movement of populations and infrastructure

A supportive institutional and policy environment at the state and national levels can enable local adaptation. Mainstreaming these issues into policy and practice leads to holistic rather than sectoral engagement in climate change. Cities act cross-sectorally, a critical approach for dealing with climate change and disaster management. In this context, mainstreaming implies integrating awareness of future climate change impacts into existing and future policies and plans of developing countries, as

FIGURE 2.3 / Relationship between the cost of adaptation and climate change

Source: Stern, N., *Stern Review on the Economics of Climate Change* (Cambridge: Cambridge University Press, 2006).



Preparing now reduces costs later

Societies have a long record of managing the impacts of weather- and climate-related events. Nevertheless, additional adaptation measures will be required to reduce the adverse impacts of projected climate change and variability, regardless of the scale of mitigation undertaken over the next two to three decades. Moreover, vulnerability to climate change can be exacerbated by other stresses. These arise from, for example, current climate hazards, poverty and unequal access to resources, food insecurity, trends in economic globalization, conflict, and incidence of diseases.

Some planned adaptation to climate change is already occurring on a limited basis. Adaptation can reduce vulnerability especially when it is embedded within broader sectoral initiatives. There is high confidence that there are viable adaptation options that can be implemented in some sectors at low cost, and/or with high benefit–cost ratios. However, comprehensive estimates of costs and benefits of adaptation need to be evaluated for each urban area.

The urban poor are typically at the highest risk in the event of natural disasters due to the location of low-income settlements. These settlements are often on sites vulnerable to floods and landslides, infrastructure is weak or lacking, and housing is substandard and prone to fire damage or collapse. The urban poor thus face threats to their lives, assets, and future prosperity due to an increase in risks of storms, floods, landslides, and extreme temperatures. Urban poor are also likely to get unequal distribution of scarce assets such as water, energy supply, and urban infrastructure, thereby increasing their vulnerability. Recovering from disasters is also particularly difficult for the poor as they do not have resources or adequate safety nets, and public policies often prioritize rebuilding in

other parts of the city.[23] Environmental- and climate change-related problems affect the urban poor disproportionately because of poor quality and overcrowded housing and the inadequacies in provision of water, sanitation, drainage, health care, and garbage collection.

The adaptive capacity of a society is intimately connected to its social and economic development. However, the adaptive capacity is unevenly distributed across and within societies. A range of barriers limit both the implementation and effectiveness of adaptive measures. The capacity to adapt is dynamic and influenced by a society's productive base, including natural and man-made capital assets, social networks and entitlements, human capital and institutions, governance, national income, health, and technology. Even societies with high adaptive capacity remain vulnerable to climate change, variability, and extreme events.

Early mitigation of GHG emissions will decrease future adaptation costs. However, even if efforts to stabilize GHG concentrations are relatively successful, some degree of warming and related impacts will continue to occur in the future. An effective response to city-level climate change must therefore combine both mitigation (to avoid the unmanageable) and adaptation (to manage the unavoidable).[24]

The urban poor are typically at the highest risk in the event of natural disasters because of the location of low-income settlements.

There are synergies between successful climate change adaptation and successful local development. In urban areas, poverty reduction, including the provision of housing upgrading and basic civic infrastructure and services, is central to adaptation. Successful, well-governed cities greatly reduce climate-related risks for low-income populations.

All adaptation measures can be categorized into five categories and their combinations: (a) mobility, (b) storage, (c) diversification, (d) communal pooling, and (e) exchange. The effectiveness of these strategies is a function of the social and institutional condition of the city and needs to be designed to be region specific.

- ***Mobility*** is the most common adaptation response, such as relocation of a vulnerable population away from flood plains and landslide-prone slopes. Mobility may have extremely adverse social consequences if it is not planned as a part of an adaptation strategy due to the attendant social and political instability (such as when people are forced to relocate away from their livelihoods and social support system, or when they are unwanted in their new neighborhood).
- ***Storage*** refers to pooling of risks across time. Storage strategies are relevant to individual households and communities. If adequate high-quality urban infrastructure is provided to a community, the need for storage can be substantially reduced. Storage is most useful to address food and water scarcity in the immediate aftermath of a disaster. Several sound practices for storage exist, such as the 72-hour self-sustaining food supply that is recommended for each family by the disaster management plans in several cities.
- ***Diversification*** refers to pooling of risks across assets and resources of households and communities. Some good adaptation strategies include mixed land-use urban development plans so that the community has a mix of economic background, commercial activities, and employment opportunities.

- ***Communal pooling*** refers to pooling of assets and resources, sharing of incomes from particular activities across households, or mobilizing the use of resources that are collectively held during times of scarcity. Communal pooling spreads risks across households. It can take place through better interaction between the various stakeholders or communities that are likely to be affected by a disaster. The most common communal pooling programs are those that aim to develop community-level support groups or self-help groups. Micro-finance programs that pool community resources and provide support on the basis of need are another example of adaptation through communal pooling.
- ***Exchange*** is the most versatile adaptation response, and it is extremely important for urban areas. Exchange and market mechanisms, both formal and informal, are critical for economic development of the cities. Market-based or exchange adaptation includes provision of access to better and newer markets by the community. Programs that provide insurance to cover buildings that may be damaged due to earthquake or floods are examples of market-based adaptation practice. Market-based approaches also allow a city to monetize their assets, which can then be used to raise resources for undertaking various developmental and disaster risk management programs. This adaptation response therefore enables the community and the city to share risks with the much wider global community.

An illustrative list of national, regional, and local mitigation policies and instruments that have been suggested is shown in Table 2.4, which also presents some examples of applications in the water, energy, transport, building, and industry sectors. It also presents key constraints and key opportunities that these measures, policies and instruments may cause when applied at city level.

TABLE 2.4/ Selected examples of key sectoral adaptation opportunities pertaining to urban areas

Source: IPCC, *Climate Change 2007: Synthesis Report – Summary for Policymakers.* Assessment of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC: Cambridge University Press, 2007).

Sector	Adaptation option/ strategy	Underlying policy framework	Key (–) constraints and (+) opportunities to implementation
Water (e.g., King County/ Seattle, Singapore)	Expanded rainwater harvesting; water storage and conservation techniques; water reuse; desalination; water-use and irrigation efficiency	National water policies and integrated water resources management; water-related hazards management	(–) Financial, human resources, and physical barriers (+) Integrated water resources management; synergies with other sectors
Infrastructure and settlements (including coastal zones) (e.g., Venice, London, New York)	Relocation; seawalls and stormsurge barriers; dune reinforcement; land acquisition and creation of marshlands/wetlands as buffer against sea-level rise and flooding; protection of existing natural barriers	Standards and regulations that integrate climate change considerations into design; land-use policies; building codes; insurance	(–) Financial and technological barriers (+) Availability of relocation space; integrated policies and management; synergies with sustainable development goals

Adaptation strategy to protect infrastructure from flood risk

TABLE 2.4/ (cont.)

Sector	Adaptation option/ strategy	Underlying policy framework	Key (–) constraints and (+) opportunities to implementation
Human health (e.g., Singapore, New York)	Heat-health action plans, emergency medical services, improved climate-sensitive disease surveillance and control, safe water and improved sanitation	Public health policies that recognize climate risk; strengthened health services; regional and international cooperation	(–) Limits to human tolerance (vulnerable groups), (–) Knowledge limitations (–) Financial capacity (+) Upgraded health services, (+) Improved quality of life
Tourism (e.g.,Switzerland)	Diversification of tourism attractions & revenues, shifting ski slopes to higher altitudes and glaciers	Integrated planning (e.g., carrying capacity; linkages with other sectors); financial incentives, e.g., subsidies and tax credits	(+) Appeal/marketing of new attractions; (–) Financial and logistical challenges (–) Potential adverse impact on other sectors (e.g., artificial snow-making may increase energy use) (+) Revenues from 'new' attractions (+) Involvement of wider group of stakeholders
Transport (e.g., King County/Seattle, Albuquerque, Rockville, Singapore, Tokyo)	Realignment/relocation; design standards and planning for roads, rail, and other infrastructure to cope with warming and drainage	Integrating climate change considerations into national transport policy; investment in R&D for special situations, (e.g.,permafrost areas)	(–) Financial and technological barriers (+) Availability of less vulnerable routes (+) Improved technologies (+) integration with key sectors (e.g., energy)
Energy (e.g., King County/Seattle, Albuquerque, Rockville, Singapore, Tokyo)	Strengthening of overhead transmission and distribution infrastructure, underground cabling for utilities, energy efficiency, use of renewable sources, reduced dependence on single sources of energy	National energy policies, regulations, and fiscal and financial incentives to encourage use of alternative sources; incorporating climate change in design standards	(+) Access to viable alternatives (–) Financial and technological barriers (–) Acceptance of new technologies; (+) Stimulation of new technologies (+) Use of local resources

The Primer now looks at the main consequences of climate change, with a focus on sea-level rise, temperature change, precipitation change, resilience, and extreme events. The relationship between consequences and the extent of mean global temperature rise is shown in figure 2.4. When global annual temperature increases, several effects are likely to occur. The figure shows the potential impacts of a 5°C change in temperature to the water, ecosystems, food, coasts, and health sectors.