Scientists agree: global temperatures are rising, causing a suite of impacts including more variable and extreme weather, increased flooding and drought, more common heat waves and fire and the spread of new and existing vector-borne disease. This “new normal” is already here, and the many impacts of environmental change on health are increasingly being recognized.

Although the entire globe faces a dramatic change in environmental conditions, the specific impacts of climate change will differ among regions. In Virginia, major health impacts are likely from sea level rise, an increase in severe storms due to a warming ocean and an increasingly humid atmosphere, and extreme summer temperatures. Environmental changes expected in Virginia include:

1. **Increases in severe and extreme weather.** Given Virginia’s long coastline and many tidal rivers, storms and flooding are likely to be very problematic. Hurricanes and other coastal storms gain energy from the warming ocean, and increasing temperatures cause air masses to hold more water, further increasing storm severity. For every 1 °C increase in air temperature, the frequency of storms as damaging as Hurricane Katrina is expected to increase by 200-700%. The health impacts of extreme storms include:

   - **Flood waters can distribute dangerous chemicals or pathogens** across wide areas, contaminating drinking and recreational waters, food crops, stored food and fish or shellfish stocks. Virginia is likely to experience the same flood-related increase in intestinal illnesses seen on Maryland’s Eastern Shore.
   - **Flooding can overwhelm sewage treatment plants and aged sewer systems,** releas-ing large quantities of sewage into waterways, spreading pathogens, contaminating drinking and recreational water and infiltrating residences.
   - **After floodwaters retreat, damp conditions in homes and buildings foster the growth of mold** and mildew in walls and furniture, aggravating asthma and other respiratory problems; furniture and possessions may be contaminated with bacteria and toxins from floodwaters.
   - **Destruction of residential property can result in large-scale displacement, social disruption, and illness.**
In New Orleans after Hurricane Katrina, looting and violence were widespread and inadequate food and sanitation in crowded shelters led to illness, anxiety and social unrest. Effects on young children were particularly pronounced and long-lived.9

- Hospitals may flood or lose power, requiring evacuation, preventing chronically ill or injured persons from obtaining required care or medicines, and delaying treatment of injuries. Damage to transportation systems may interfere with access to food and medicine, threatening the chronically ill, very young and elderly.

2. **Dramatic increases in routine tidal flooding**. Coastal regions and communities near Chesapeake Bay are increasingly subject to flooding as sea level rise causes high tides to wash over low-lying areas like Hampton Roads and Norfolk.9 10 All of the risks from flooding after coastal storms also pertain to tidal flooding.

3. **Longer and more severe heat waves**. High summer temperatures are on the increase, and heat is a serious problem in urban areas, where temperatures can be 5-8°F warmer than in suburban areas. Heat stress is particularly serious for children exercising outdoors, the elderly, people with inadequate air conditioning and outside workers.11 Early stages of heat stress can easily be confused with fatigue, but if ignored, heat stress can lead to coma and even death. High temperatures also increase the risk of toxic algal blooms that can contaminate drinking water and harm seafood.

4. **Drought**. The Mid-Atlantic will experience periodic drought as temperatures warm and weather becomes more variable. Drought will impact Virginia’s agriculture and add to the risks of food and water insecurity: as many as half of Virginia’s counties are at risk for water shortages by mid-century.12 Under dry conditions, toxins and pathogens can become concentrated in recreational waters, posing an increased health risk.

5. **Air quality is likely to decline as ozone production increases during hot weather, particulates from fires blow through and the concentrations of aerial pollen increase**.1 This will aggravate Virginia’s already serious asthma problem, and add to the risk of other respiratory disease, heart attack and stroke.

6. **Warming temperatures favor insect vectors of disease**. Lyme disease is spreading in Virginia as the ticks that spread it overwinter in greater numbers.13 In addition, the insect vectors of Dengue fever, malaria and chikangunya are increasingly found in the U.S., including the Mid-Atlantic.1

**Vulnerable populations are at greatest risk.** The largest health impacts of climate change are likely to fall on children, the elderly, the chronically ill, people who work outside and those with low incomes and/or limited education. For these populations, climate change can greatly multiply the health risks that are already present.

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