DROUGHTS AND FIRES

THE DIRECT AND INDIRECT IMPACTS OF INCREASED FREQUENCY AND SEVERITY IN THE U.S.

BY LEIGH CONNIFF, JOCELYNE HELBLING AND KYRON HOARE FOR GEOGRAPHY 313/513: GLOBAL CLIMATE CHANGE | There is high confidence that increased temperatures will lead to more precipitation falling as rain rather than snow, earlier snow melt, and increased evaporation and transpiration. Thus the risk of hydrological, where decreased precipitation affects stream flow, soil moisture, reservoir and lake levels, and groundwater recharge, and agricultural drought, in which conditions cause the water availability does not meet water demand either in time or volume, increases as temperatures rise. Additionally, the drier conditions associated with drought increase forest areas’ vulnerability to pest infestation, and weakens plants increasing fuel for wildfires.

DIFFERENT TYPES OF DROUGHT

Meteorological: Related to precipitation amount and length of dryness

Hydrological: How decreased precipitation affects stream flow, soil moisture, reservoir and lake levels, and groundwater recharge.

Agricultural: Caused by a variety of reasons, including low precipitation or the timing of water availability. In 2012, 80% of agricultural land experienced drought, the most extensive since the 1950s. 70% of crop production and livestock production was based in areas experiencing drought.

LACK OF PRECIPITATION WEAKENS FORESTS PROVIDING MORE FUEL FOR INTENSE WILDFIRES

760,000 HEALTH ISSUES WERE LINKED TO WILDFIRE SMOKE BETWEEN 2000 AND 2009, COSTING A TOTAL OF $34 BILLION

HEALTH CONCERNS

Due to the wind, smoke can have far-reaching impacts. It is estimated that 2/3 of US citizens live in counties affected by smoke conditions. Air pollution from wildfires can also offset progress made by the Clean Air Act.

ECONOMIC COST

Wildfire suppression currently cost an estimated $125 Billion annual, and could increase by an additional $60 Billion by 2050. Overall, retail food prices went up between an estimated 3% and 4% following the 2012 droughts. In total the 2012 drought cost the U.S. economy $30 Billion.

FOLLOWING THE 2012 DROUGHT POULTRY PRICES WENT UP 5.5% AND EGG PRICES WENT UP 6.9%

A 2002 FIRE IN CANADA LEAD TO 30-FOLD INCREASE IN FINE PARTICULATE MATTER, 1,000 MILES AWAY IN BALTIMORE

HUMAN IMPACT

In 2012, an estimated 80% of agricultural land in the United States experienced drought, and this is expected to have long term impacts on the fertility of the land as well as on food prices in the coming years. Overall the 2012-2014 drought in the US is estimated to have reduced the gross domestic product by 0.5-1%. Furthermore, around 1,700 counties spread across 36 states were legally declared as primary natural disaster areas by August 2012. Along the Mississippi, the water level dropped to 50 feet below what it was during the floods of the previous year in places, and this had detrimental impacts on trade and commerce along the river. This is because a lower water level means barges have to lose weight so they cannot carry as many goods, and there is increased barge traffic as river velocity slows. This all meant that in December 2011 and January 2012, it was estimated that $7 billion worth of goods were at risk of not reaching its destination.

A 2002 FIRE IN CANADA

LEAD TO 30-FOLD INCREASE IN FINE PARTICULATE MATTER, 1,000 MILES AWAY IN BALTIMORE

PERCENT AREA IN U.S. DROUGHT MONITOR CATEGORIES


Estimates of the percentage increase in the area burned in regions across the West for 1°C warming

U.S. WILDFIRES BY NUMBER OF FIRES AND ACRES BURNED 1960-2013

U.S. WILDFIRES AND SMOKE, 2011

WILDFIRES IN THOUSANDS

ACRES IN MILLIONS

PERCENT AREA IN U.S. DROUGHT MONITOR CATEGORIES


Estimates of the percentage increase in the area burned in regions across the West for 1°C warming

U.S. WILDFIRES BY NUMBER OF FIRES AND ACRES BURNED 1960-2013

U.S. WILDFIRES AND SMOKE, 2011