

## IN THE US, CLIMATE CHANGE HAD A DIRECT HAND IN

IMPACT	STUDIES
<b>WARMING</b>	
US long-term temperature change	(Christidis and Stott, 2014; Christidis et al., 2011b; Jones et al., 2008; Karoly et al., 2003; Stott, 2003)
US winter warming	(Van Oldenborgh et al., 2018; Wolter et al., 2016)
Western US warming	(Lehner et al., 2018; Abatzoglou et al., 2014; Morak et al., 2011; Bonfils et al., 2007)
<b>EXTREME HEAT</b>	
US extreme temperatures in February 2017	(Van Oldenborgh et al., 2017a)
Southeastern US extreme heat and drought in the fall of 2016	(Williams et al., 2017)
Southwestern US heat in the summer of 2013	(Shiogama et al., 2014)
US extreme temperatures in July 2012	(Diffenbaugh and Scherer, 2013)
Western US extreme heat events	(Diffenbaugh et al., 2017)
Eastern US extreme spring heat in 2012	(Knutson et al., 2013)
Texas extreme heat and drought in the summer of 2011	(Jeon et al., 2018; Paciorek et al., 2016; Rupp et al., 2012a; Hoerling et al., 2012; Rupp et al., 2012b)
<b>AVERAGE PRECIPITATION</b>	
North-central and eastern US average precipitation increase	(Knutson and Zeng, 2018; Knutson et al., 2014)
<b>EXTREME PRECIPITATION</b>	
Hurricane Harvey and extreme precipitation in August 2017	(Wang et al., 2018; Lehner et al., 2018; Abatzoglou et al., 2014; Morak et al., 2011; Bonfils et al., 2007)
California extreme precipitation that led to the Oroville Dam breach in January 2017	(Huang et al., 2018)
Southern Louisiana extreme precipitation in August 2016	(Van Der Wiel et al., 2016; Wang et al., 2016)
Missouri extreme precipitation in December 2015	(Fosu et al., 2018)
Southern Great Plains El Niño precipitation anomaly in May 2015	(Wang et al., 2015)
Boulder floods and extreme precipitation in September 2013	(Pall et al., 2017; Eden et al., 2016)
Hurricane Katrina and extreme precipitation in August 2005	(Trenberth et al., 2007)

FLOOD RISK	
Northeastern US flood magnitude and frequency	(Armstrong et al., 2014)
SEA SURFACE TEMPERATURE	
Eastern Pacific extreme marine heat wave and mortality in 2016	(Jacox et al., 2018; Walsh et al., 2018; Oliver et al., 2018)
Northeast Pacific extreme marine heat wave and mortality	(Weller et al., 2016b)
SEA SURFACE TEMPERATURE & EXTREME PRECIPITATION RISK	
Hurricane Harvey and high sea surface temperatures in August 2017	(Trenberth et al., 2018; Wang et al., 2018)
Boulder floods and high sea surface temperatures in August 2013	(Trenberth et al., 2015)
Hurricane Sandy and high sea surface temperatures in October 2012	(Trenberth et al., 2015)
Snowmageddon and high sea surface temperatures in February 2010	(Trenberth et al., 2015)
Hurricane Katrina and high sea surface temperatures in August 2005	(Trenberth et al., 2007)
SEA LEVEL RISE & COASTAL FLOODING	
US sea level rise and flood days	(Strauss et al., 2016)
US cities and sea level rise	(Becker et al., 2014)
Miami tidal flood risk	(Sweet et al., 2017)
Hurricane Sandy storm surge in October 2012	(Garner et al., 2017; Lin et al., 2016; Reed et al., 2015; Toumi and Restell, 2014; Miller et al., 2013; Sweet et al., 2013; Kemp and Horton, 2013)
Hurricane Katrina storm surge in August 2005	(Irish et al., 2013)
Chesapeake Bay and Delaware Estuary salinity increase	(Hilton et al., 2008; Ross et al., 2005)
HURRICANE ACTIVITY	
Central and Eastern Pacific active hurricane seasons	(Murakami et al., 2016a; Murakami et al., 2016b)
Hurricane Sandy intensity in October 2012	(Reed et al., 2015; Trenberth et al., 2015)
Hurricane Katrina intensity in August 2005	(Grinsted et al., 2013)

DROUGHT RISK	
California warmth and drought from 2011 to 2016	(Seager et al., 2015; Park et al., 2015; Mann and Gleick, 2015; Shukla et al., 2015; Diffenbaugh et al., 2015; AghaKouchak et al., 2014)
Central US precipitation deficit in the summer of 2012	(Rupp et al., 2017)
Texas precipitation deficit during March-August 2011	(Paciorek et al., 2018)
HYDROLOGICAL CHANGE	
Western US temperature driven snow drought, river flow change, etc.	(Huang et al., 2018; Berg et al., 2017; Fosu et al., 2017; Mote et al., 2016; Hidalgo et al., 2009; Das et al., 2009; Pierce et al., 2008; Bonfils et al., 2008; Barnett et al., 2008)
Colorado River reduced streamflow	(McCabe, 2017; Udall and Overpeck, 2017)
Southwestern US decreased flood magnitude	(Hirsch and Ryberg, 2011)
WILDFIRE ACTIVITY	
Alaska increased wildfire severity	(Partain, Jr., 2017)
Western US moisture loss and wildfire risk	(Williams et al., 2018; Tett et al., 2018; Abatzoglou and Williams, 2016)
California increased wildfire severity	(Mann et al., 2016; Yoon et al., 2016)
CIRCULATION CHANGE	
Eastern US cold spells and temperature dipoles	(Bellprat et al., 2017; Singh et al., 2016; Lee et al., 2015)
California wet and dry weather whiplash	(Swain et al., 2018; Wang and Schubert, 2014)
California drought and the “Ridiculously Resilient Ridge”	(Seager et al., 2017; Wang et al., 2017; Swain et al., 2014; Wang et al., 2014)
CARBON SINKING	
US forests and carbon sinking	(Zhang et al., 2012)

*Climate change detection and attribution studies are broken down into two broad groups: US and global. Within the two groups, the studies are categorized by the subject of each study’s detection or attribution finding. Finally, studies within each category are grouped together by impact. Impacts are trends or events affected by climate change.*