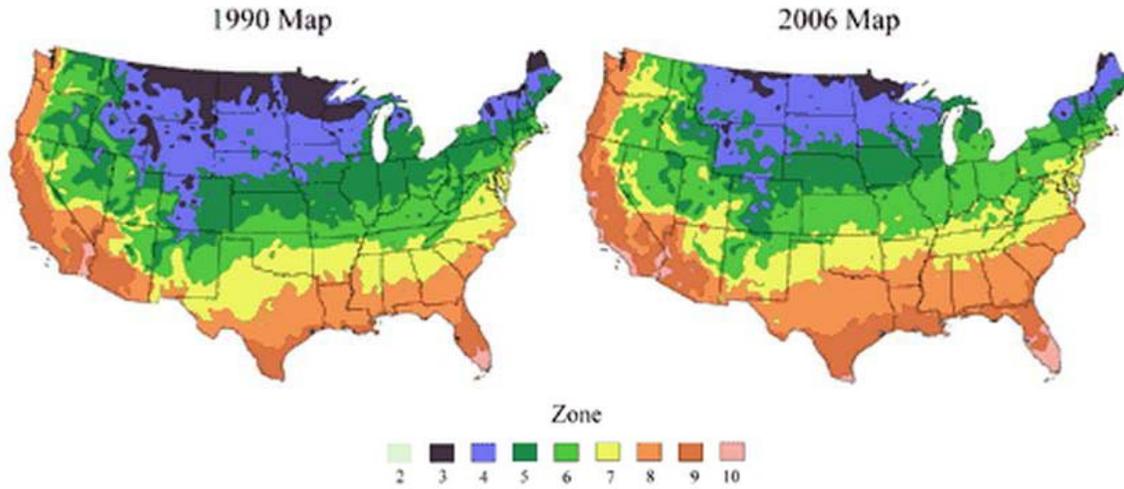


# Thinking About Climate Change

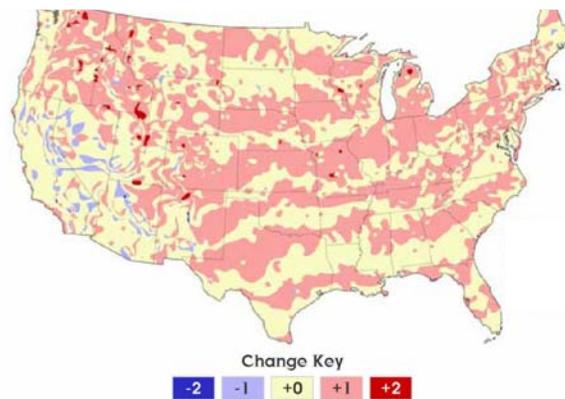


## Observed Changes in USDA Plant Hardiness Zones, 1990-2006

Plant hardiness is a plant's ability to survive difficult conditions such as cold, heat, drought, flooding, wind and salt. The U. S. Department of Agriculture's (USDA) Plant Hardiness Zone Map is used by gardeners to determine which plants will grow best in their location. The zones are determined by the average annual minimum winter temperature, which are divided into 10°F zones. The plant hardiness maps were first published in 1960, and then updated in 1990 and 2012 by the USDA. In 2006 the Arbor Association published these three interesting maps, which show the hardiness zones in 1990 and 2006, and the change in hardiness zones in the U.S.



Difference in plant hardiness zones, 1990-2006



1. What environmental factor (parameter) is hardiness based upon in these maps?  
\_\_\_\_\_
2. Compare the hardiness zones in 1990 and 2006. How would you describe the change in the U.S. over those 16 years?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Examine the lower map. This map shows where and by how much the hardiness zones have changed. Where did most of the increase by TWO hardiness zones take place?  
\_\_\_\_\_  
Where did most of the decrease in hardiness zones take place? \_\_\_\_\_
4. How do you think these changes can affect our gardens, agriculture and the way we live? What changes do you see in your area?  
\_\_\_\_\_

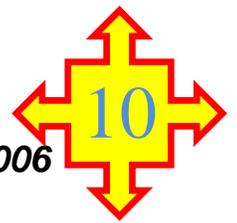
Source: National Arbor Day Foundation. 2006. Hardiness zones. Retrieved from <http://www.arborday.org/media/zones.cfm>  
USDA Agricultural Research Service. (no date). Retrieved from <http://planthardiness.ars.usda.gov/PHZMWeb/>  
View map changes from 1990 to 2006 at <http://www.arborday.org/media/mapchanges.cfm>

Developed by Dr. Pam Blanchard and Dianne Lindstedt for the Louisiana Sea Grant College Program <http://www.lamer.lsu.edu>

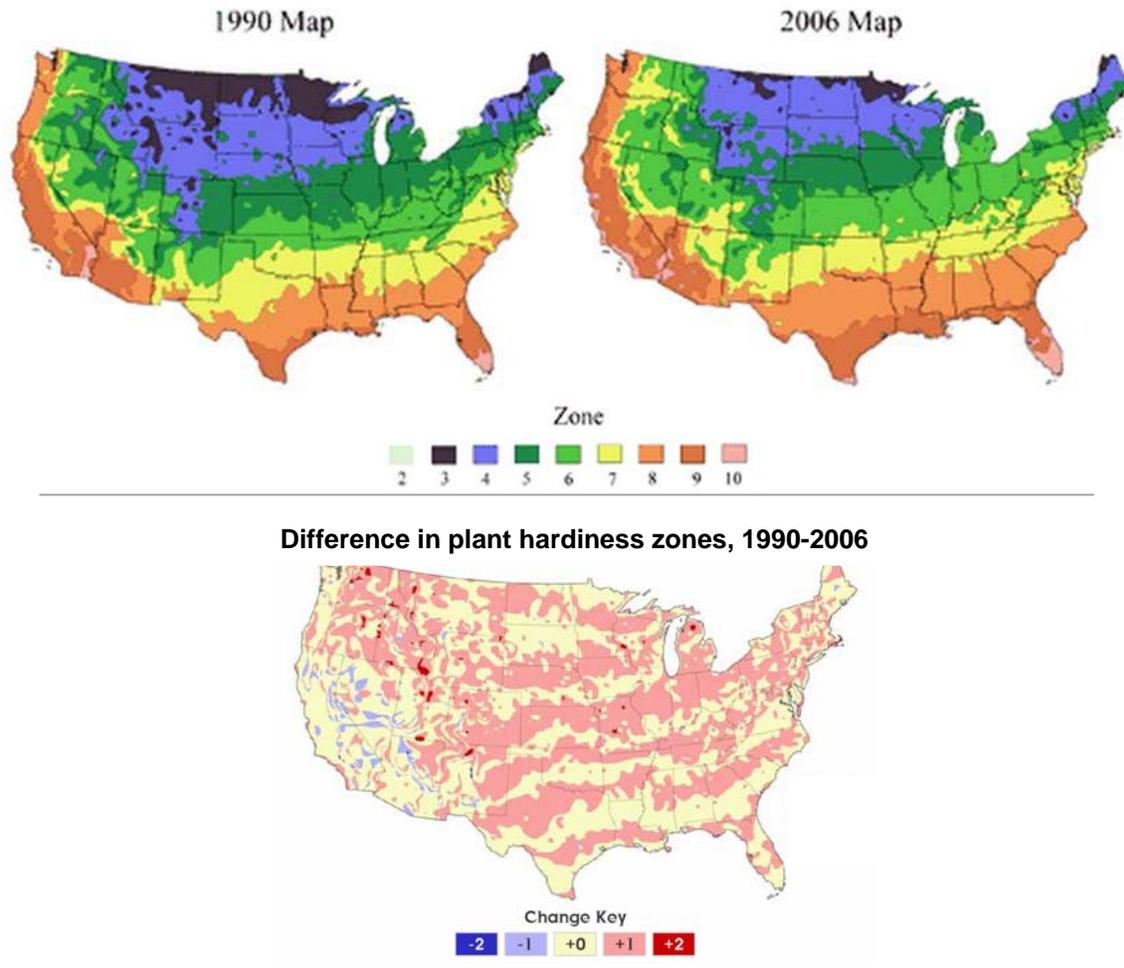


## Thinking About Climate Change

### Observed Changes in USDA Plant Hardiness Zones, 1990-2006



Plant hardiness is a plant's ability to survive difficult conditions such as cold, heat, drought, flooding, wind and salt. The U. S. Department of Agriculture's (USDA) Plant Hardiness Zone Map is used by gardeners to determine which plants will grow best in their location. The zones are determined by the average annual minimum winter temperature, which are divided into 10°F zones. The plant hardiness maps were first published in 1960, and then updated in 1990 and 2012 by the USDA. In 2006 the Arbor Association published these three interesting maps, which show the hardiness zones in 1990 and 2006, and the change in hardiness zones in the U.S.



1. What environmental factor (parameter?) is hardiness based upon in these maps? **Temperature only.**
2. Compare the Hardiness Zones in 1990 and 2006. How would you describe the change in the U.S. over those 16 years? **In the east and central part of the U.S., the northern and southern boundaries of the hardiness zones have moved northward, which results in the striped pattern we see in the lower map. The southern edges of the 1990 zones shifted northward (or didn't get as cold in the winter), while the rest of the zone did not change. In the west, there was mostly no change and pockets of lower average winter minimum temperatures.**
3. Examine the lower map. This map shows where and by how much the hardiness zones have changed. Where did most of the increase by TWO hardiness zones take place? **In the Rocky Mountains of the western U.S.** Where did most of the decrease in hardiness zones take place? **West of the Rocky Mountains.**
4. How do you think these changes can affect our gardens, agriculture and the way we live? What changes do you see in your area? **Answers will vary. Some plants will produce less, need more attention, more heat tolerant plants will be needed, some crops will not have as high a yield under longer heat stress, more places will need to use air conditioning, and animals will require more water and perhaps shelter from the sun**