

5 Ways Global Warming is Impacting Allergies



Health Professionals Maybe
Facing New Treatment Challenges



IT ALL BEGINS WITH CO₂

Have you found treating patient allergies more perplexing of late? If so, you are not alone. Allergic disease is a public health problem that has increased rapidly in the recent decades and is now recognized as a major global epidemic¹, in part due to the vast number of people who suffer from this disease. The World Health Organization (WHO) estimates that 400 million inhabitants in the world suffer from allergic rhinitis and 300 million from asthma.² The economic burden is nothing to sneeze at either. In 2007, the total cost of allergic disease to the United States was 19.7 billion USD.³

Although there are several triggers for allergens, an increasing number of scientist believe one of the greatest contributors to allergens is global warming.

To understand how global warming affects allergies, we must first understand the importance of CO₂ (carbon dioxide) on plant life. If you remember your elementary school chemistry, you will recall that CO₂ is one of the four fundamentals needed for plant growth, along with water, nutrients, and light. CO₂ is essential for producing extra nutrients for many plants, including such allergy offenders as grasses and weeds, which are fast growers and can adapt quickly. The increase of CO₂ into our atmosphere is allowing the plant to grow faster, while this may be great for boosting food producing crops; it is bad news for allergy sufferers.

PLANT LIFE

The levels of CO₂ in the atmosphere has increased by about 40 percent since the 1700s⁴, now the highest level in 800,000⁵ years.

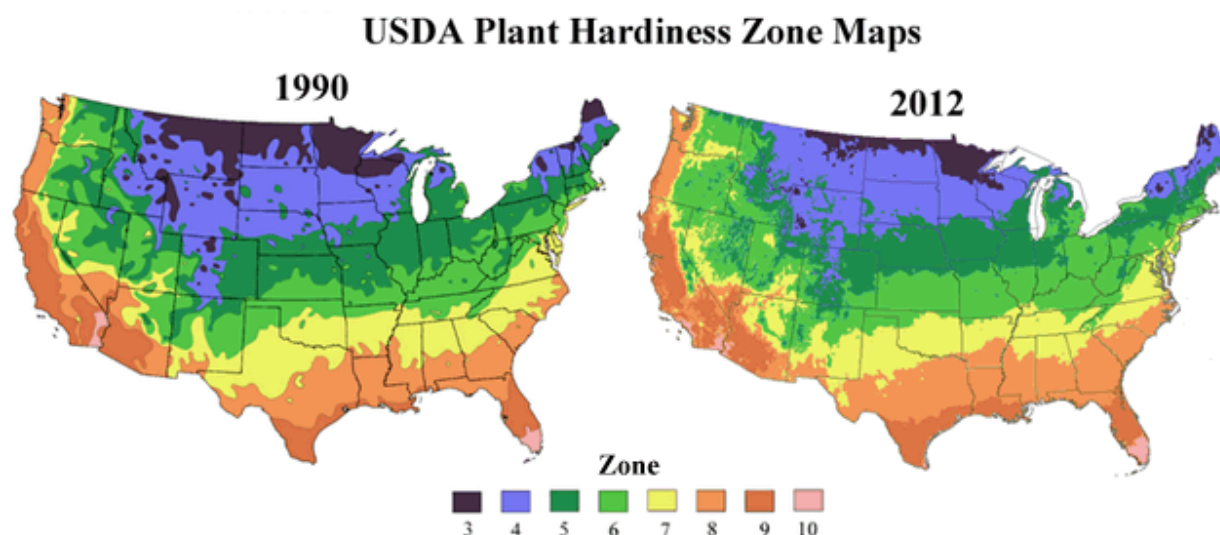
Lewis Ziska, PH.D., a weed ecologist at the Agriculture Research Service division of the U.S. Department of Agriculture, has conducted more than 20 years of study on the growth rates, bloom times, pollen production, and other factors under varying air temperatures and CO₂ levels in Baltimore, MD. It is worth noting that Baltimore has higher local emissions from transportation and manufacturing (450 parts per million), and higher temperatures due to the urban heat-island effect.

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Dr. Ziska found this condition could have unusual results. Ragweed that grew five and six feet tall in rural areas had counterparts between 10 and 20 feet tall in the crowded urban area of Baltimore.

LONGER BLOOM SEASONS

Global warming has also created longer growing seasons and warmer temperatures, in fact, spring now arrive 10 – 14 days earlier than it did just 20 years ago⁶ while extending fall pollen season sometimes through October.⁷



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Longer growing season can contribute to a plants concentration. Poison ivy, which ranks among the top ten “medically problematic” plants in the United States, with more than 350,000 cases of contact per year,⁹ when exposed to greater amounts of CO₂ produces more urushiol. As if this itchy substance was not enough, the increase in CO₂ causes the poison ivy vines and other aggressive vines such as Japanese honeysuckle, poison oak, English ivy, and kudzu to grow faster.^{10 11}

FUNGAL SPORES

One might think global warming would provide some relief to patients suffering from allergens triggered by fungal spores. However, one study found that doubling atmospheric CO₂ levels lead to a 4-fold increase in plant growth could also accelerate fungal activity, for example, when plants biomass increases due to the longer growing season so will its decomposition increase.

Heavy rainfall and flooding can also accelerate the growth of fungal spores. Following Hurricane Katrina, for example, hospitals in New Orleans report increase in patients with allergy symptoms, nagging cough, and childhood asthma.¹² Time will only tell how we fare with Harvey.

Additionally, as extreme heat and dry conditions accelerate, more and more people will rely on air conditioners. Units installed incorrectly are breeding grounds for molds.



ADDITIONAL CONSIDERATIONS

While they may not necessarily be directly linked to allergies, it is worth noting the migration of animals in search of food and water.

According to Dr. William Karesh, a veterinarian and vice president of global health programs at the Wildlife Conservation Society (WCS), “We will see a shift in the geographic distribution of diseases, with the certain areas having reduced prevalence and other areas increasing.” Climate change affects both hosts and vectors, disrupting the balance developed over thousands of years. Scientist predicts we may begin to see pathogens such as H5N1, Lyme disease, and TB rising in what was once considered low-risk areas because of global warming.

SO, WHAT DOES THIS MEAN FOR HEALTHCARE PROVIDERS?

As trees, plants, and animals are unable to tolerate the hotter conditions; many species are shifting northward to higher elevations. Healthcare providers may start to encounter new and different challenges not previously seen in their practices, and they may need to expand their areas of expertise. In some cases, protocols may need to be adjusted, or paired, to achieve their therapeutic goals.

Diligent healthcare professionals will inevitably be the first to raise any alerts regarding new allergens in their areas. Staying active in your local associations and professional groups may be the best way for busy practices to stay current with these migrating allergies.

¹ Pawankar 2014; Platts-Mills 2015

² Bousquet and Khaltaev; 2007

³ Zuberbier et al; 2014

⁴ Le Quere, et al; 2009

⁵ Luthi, D., et al; 2008

⁶ USGCRP, 2009

⁷ Essl et al; 2015

⁸ Comparison of the 1990 and 2012 USDA Plant Hardiness Zone Maps. Image credit: USDA and Arbor Day Foundation

⁹ AAFA, 2005; 2010

¹⁰ Ziska, L.H., et al; 2007

¹¹ Middleton, B.A.; 2006

¹² Reid, C.E. and J.L. Gamble, 2009