WINTER 2021

# **CLIMATE QUARTERLY**

The Newsletter of the AAD ERG on Climate and Environmental Affairs



# **CLIMATE CHANGE IN THE LITERATURE AND NEWS**



Women's Dermatology

Special Issue of IJWD Mary Williams, MD

The January 2021 issue of the online, open access International Journal of Women's Dermatology

is dedicated to the impacts of climate change on dermatology and presents a comprehensive review of the subject. With a simple click, you can download articles on "tropical diseases" that may soon be moving into your back yard; or how climate change may fan the flames of our skin cancer epidemic; or how the skin health of children will be particularly impacted by climate change. You can learn how skin as the organ of thermoregulation keeps us cool and what are its vulnerabilities in our warming world. Climate change disrupts food production and economies. fostering instability political and population displacements. These forced human migrations, too, have their dermatologic Continued consequences.

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As fossil fuels combust, they not only send the greenhouse gas, carbon dioxide, into the atmosphere to trap heat and warm our world, they also emit a number of <u>polluting gases and small particles that</u> harm our health – including that of the skin. Sunscreens in recent years have come under scrutiny as potential polluters themselves, harmful to the ocean's coral reefs and perhaps even to us. Two papers offer a comprehensive review of sunscreens, <u>defining their characteristics</u> and reviewing the <u>evidence for their toxicity</u> to the environment and to humans.

While it is important for dermatologists to be knowledgeable about how climate change is affecting their patients, it is equally important for us to take stock of how <u>the practice of medicine itself is</u> <u>contributing to climate change</u> and what we as practitioners can do to <u>lighten our carbon footprints</u>. Then, you can take a quiz and see if you can correctly identify the <u>cause of an ulcer</u> in a flood victim. Finally, something new to worry about: <u>venomous</u> <u>lionfish</u> in southern coastal waters.

We are grateful to the Editors of the IJWD, Drs. Jenny Murase and Dedee Morell, for the opportunity to present this information in a widely accessible format, and to the many ERG members who wrote papers and reviewed manuscripts and brought forth this special issue.

#### Literature Review

Sarah Coates, MD

 Senay E, Sarfaty M, Rice MB. Strategies for Clinical Discussions About Climate Change. Ann Intern Med. 2020 Dec 15;M20-6443. doi: 10.7326/M20-6443. PMID 33315471.

**Summary:** This opinion piece provides practice tips for how to integrate discussions about the health effects of climate change into clinical practice. Readers are given sample scripts of how to discuss heat-related illness, wildfires, aeroallergen-related conditions, and air pollution-related disease. This is an excellent resource for those seeking to incorporate climate advocacy into their clinical practice through relevant patient dialogues.

• <u>Chaplin CL</u>, <u>Wernham AGH</u>, <u>Veitch D</u>. <u>Environmental sustainability in dermatological</u> <u>surgery. Br J Dermatol. 2020 Nov 5. doi:</u> 10.1111/bjd.19668. PMID 33152116.

**Summary**: This perspective piece highlights practical considerations for procedural dermatologists seeking to improve the environmental sustainability of their dermatology practices. The authors employ the framework: Reduce, Reuse, Recycle, Rethink, and Research. Many of the interventions recommended can be adopted at little-to-no cost.

• O'Connor C, et al. A change of climate for climate change: the environmental benefit of specialty outreach clinics. BMJ. 2020. Apr 14;369:m1410. doi: 10.1136/bmj.m1410.

**Summary**: This retrospective study evaluated the carbon emissions saved by dermatology providers staffing outreach/satellite clinics. They found a significant savings in CO<sub>2</sub> emissions in this model, highlighting how staffing of satellite clinics, in addition to providing improved and more convenient access for patients, has significant environmental benefits, as well.

• Fathy R, Rosenbach M. Climate Change and Inpatient Dermatology. Curr Dermatol Rep. 2020 Aug 22;1-9. doi: 10.1007/\$13671-020-00310-5. PMID 32864193.

**Summary**: This scoping review highlights the ways in which climate change is poised to impact inpatient dermatology by affecting the burden of vector-borne and other infectious diseases, heatrelated illnesses, water-borne illness, and inflammatory skin diseases.

• <u>Allwright E, Abbott RA. Environmentally</u> <u>sustainable dermatology. Clin Exp Dermatol.</u> <u>2020 Nov 20. doi: 10.1111/ced.14516. Online ahead</u> <u>of print. PMID: 33215752</u>

**Summary**: This systematic review from the United Kingdom focuses on supply-side factors that can be implemented in dermatology departments to improve sustainability. They determined that there is a clear need for evidence-based guidance setting out implementable actions with identifiable benefits achievable within local clinical teams. Additional research in this area is needed.



# **Climate Sensitive Cutaneous Disease**

*Marine-Associated Dermatoses Eva R. Parker, MD* 

The oceans serve as a massive carbon reservoir. As atmospheric CO<sub>2</sub> levels increase and are absorbed by oceans, carbonic acid is formed, resulting in ocean acidification. Moreover, increasing atmospheric CO<sub>2</sub> levels have resulted in global warming with rising oceanic temperatures, mass coral bleaching, extreme weather events, and alterations in major climate oscillations (North Atlantic Oscillation and El Niño). (1) Furthermore, human impact from agricultural runoff, pollution, and over-harvesting seafood has resulted in eutrophication and reduction in competition for zooplankton. These anthropogenic changes have a significant impact on the marine environment and its ecology. (2)

One consequence of these impact is increasing global jellyfish abundance in coastal waters. As waters warm, jellyfish emerge earlier in the season, reproduction rates accelerate, and reproductive seasons are prolonged. With more rapid growth rates at higher temperatures and less overall competition for zooplankton, jellyfish have flourished. Lowered ocean salinity has further contributed to increasing populations in some geographic regions. (2,3) Additionally, jellyfish thrive at lower pH and show greater adaptation to ocean acidification owing, in part, to an absence of a calcium carbonate exoskeleton. (2)

Not surprising, the number of envenomations has increased in parallel, with an estimated 150 million people stung annually worldwide. (4) Jellyfish stings typically result in acute pain and the development of erythematous urticarial papules and plaques, often in a linear configuration. (5) While generally self-limited, delayed hypersensitivity reactions with keloid-like presentations are reported. (6) Importantly, envenomations may be fatal in some cases. (5)

This is particularly apparent in the southeastern U.S along the Gulf of Mexico where the Portuguese man-of-war (Physalia physalis) population has exploded and hundreds of stings are reported annually. While not a true jellyfish, these hydroid colonies with tentacles up to 30m long contain numerous venom-filled nematocysts and possess the ability to envenomate even after beaching and death of the organism. (2) In a 2-week period in June 2018, over 3000 people, including many tourists, incurred moon jellyfish stings in and around Daytona Beach, FL. (7) Similarly, proliferations in the Pacific jelly fish, Porpita pacifica, have been noted with a corresponding dramatic rise in the incidence of envenomations in Japan since 2005. (8) Even cooler geographic regions in northern Europe are experiencing increased envenomations. (9) For similar reasons, climate change is preferentially favoring expansion of toxic sponge populations in coral reef ecosystems worldwide, resulting in a similar increase in envenomations from these species alike. (5,10)

Seabather's eruption, also known as sea lice, is a unique marine dermatitis due to envenomation by planulae (free-swimming larvae) of the thimble jellyfish species, Linuche unguiculata and Linuche aquila. These species are found along coastal waters of the Gulf of Mexico, the Caribbean, Brazil, and the Philippines. Envenomations result in pruritic, erythematous papules in a bathing suit distribution. (5,11,12) The incidence of this eruption has increased due to warming ocean temperatures with up to 16% of swimmers affected during peak seasons in southeast Florida. Additionally, a cold-water variant known as Northern seabather's eruption has increased in frequency and been observed to present earlier in the season. This eruption has a similar presentation but is caused by the planulae of the sea anemone, Edwardsiella lineata, that is found along the mid-Atlantic and northeast coast of the U.S. (12,13) The rising incidence of seabather's eruption is linked with effects of climate change including warming water temperatures, milder winters, and downstream effects on the food chain which have allowed these ctenophore species to proliferate. (13)

Climate change is also fueling the spread of waterborne pathogens, in particular Vibrio vulnificus and Vibrio parahaemolyticus. These gram-negative bacteria result in serious human disease worldwide, most notably diarrheal disease and gastroenteritis from the consumption of contaminated seafood. For dermatologists, it is paramount to understand that infection also occurs via direct cutaneous inoculation through scrapes and wounds that are exposed to sea water or handling seafood, such as shucking oysters. In these instances, patients present with cellulitis or hemorrhagic bullae that may rapidly progress to "flesh-eating" necrotizing fasciitis. (14,15) Immunocompromised patients are at particular risk for severe disease including septicemia and death. (16) All forms of infection due to vibrio are reportable illnesses in the U.S.

Vibrio spp. thrive in warm, low-salinity waters with their proliferation mirroring ambient temperature. As ocean temperatures increase due to global warming, these pathogens reproduce more rapidly with a dramatic rise in numbers associated with spikes in sea surface temperature. Additionally, an increasing incidence of infection is observed after extreme weather events such as heat waves, hurricanes, and flooding. (14,15) The global rise in cases is unprecedented, with the CDC reporting increases in U.S. cases and noteworthy surges occurring after storms such as Hurricane Katrina. (17,18) Perhaps more alarming is the growing multidrug resistance reported by the WHO, coupled with an increasing incidence of infection in geographic areas never previously reported: Northern Europe, Northeast U.S., Alaska. (14,15)

As spring break approaches, many are planning their long-awaited getaways. Despite an ongoing global pandemic, the desire to travel this year for spring break and summer vacation remains high, with beach destinations an ever-popular choice. However, climate change is driving a surge in marine-associated cutaneous injuries and dermatoses. Thus, it is paramount that not only dermatologists who practice in coastal locations be aware of these presentations, but even land-locked practices may increasingly treat marine dermatoses in returning travelers.

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### **UPCOMING EVENTS**



#### Lectures Series: Climate Change and Dermatology

Our first webinar on December 3rd was a huge success! Thank you to our fantastic speakers for a great evening of learning and to all who attended. We had 278 individual registrations for the event and are especially proud to report that we had a global audience with people tuning in from 5 continents (see map above).

We are most excited to announce that it is time for the 2nd Webinar in this Series on Climate Change and Dermatology: February 18th, 5:30 PST/8:30 EST

We're hoping for another large turnout! <u>Register for the</u> <u>Free Webinar here</u>.

#### Speaker Lineup:

- Introduction and Moderator: Eva R. Parker, MD
- Dermatologic Manifestations of Extreme Weather: *Justin Bandino, MD*
- Ticks and Climate Change: Dirk Elston, MD
- Heat-Related Illness: Where does the skin come in?: *Mary Williams, MD*
- Plastic Use in the Office and Plastic Waste: *Mary Maloney*, *MD*
- Reducing Your Personal Carbon Footprint: John Barbieri, MD

#### ERG Annual Meeting March 11th, 5:30 PST/8:30 EST

We would love to meet in person, but this being the COVID-19 interlude, we will have to do so via Zoom. We hope you will all attend this important meeting. We'll share with you what has been accomplished by the ERG since we last met at the AAD in 2019, but more import-

antly, we need to set priorities for our work in the coming year-- and we need your help! We know there is a great deal of untapped expertise and energy in our ERG membership – let's find a way for everyone who would like to become engaged. We'll send out a more complete agenda before the meeting. In the meantime, give some thought to which of these areas interest you.

#### 1. Taskforce on organization structure:

a. The 'org of the erg': how should we be organized (committees, terms, etc.)

#### 2. Communications Committee:

- a. Newsletters & email blasts
- b. Coordinating with other derm media for CC coverage.

#### 3. Education Committee:

- a. Developing webinars, symposia, and forums
- b. AAD annual & summer meeting, ERG virtual symposia, lectureships
- c. Climate/derm core curriculum

#### 4. Intersociety Liaison Committee:

- a. Promote CC awareness and coordinate action with other derm societies including state and regional derm societies.
- b. Expand CC voice within the AAD, outreach to other committees

#### 5. Finance committee:

- a. Raise funds to support educational, research, and training initiatives in climate, environment and skin health.
- b. Pharma, corporate, philanthropic outreach
- c. ERG budget for meetings, membership & mentorship grants

#### 6. Ad Hoc Task Forces:

- a. Green Initiatives: Develop and promote strategies to green the AAD, reduce waste, reduce travel and develop offsets
- b. Divestment: Develop strategies and toolkits to support divestment from the fossil fuel sector (AAD, other derm societies/foundations, individuals)
- c. Climate change and racial equity taskforce: Develop a working relationship between these two interest groups to support common initiatives.
- d. Research taskforce: What are the big unknowns for CC and dermatology? How can we foster impactful research in the area? What are the information gaps & research priorities?



# **KEEPING UP WITH 'THE JOE'**

**Tracking President Biden's Environmental Policy** Caroline Nelson. MD

During his campaign, President Biden outlined a plan to "secure environmental justice and equitable economic opportunity".

Dermatologists, even those with an interest in climate change and public policy, are busy. In this column, my goal is to summarize the three most impactful environmental policy actions taken by the United States (US) federal government during the last quarter. While content curation is unavoidable, I will refrain from editorializing. May we successfully thread the needle.

Let us begin with President's Biden's first week in the Oval Office. If 7 days was enough time to create the earth, was it enough time to save it?

• **President Biden returned the US to the Paris Agreement (1/20/2021).** Our "nationally determined contribution" will communicate actions that the US will take to reduce Greenhouse Gas emissions. The minimum goal of this international treaty is to limit global warming to under 2 degrees Celsius compared to pre-industrial levels.

- President Biden signed the Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (1/20/2021). Key components of this executive order include:
  - Reviewing environmental policy actions during the Trump administration.
  - Taking actions to limit oil and gas exploration, such as pausing drilling in the Arctic Refuge and revoking the permit for the Keystone XL pipeline designed to transport crude oil from Canada across the US border.
  - Accounting for the benefits of reducing climate pollution by establishing an Interagency Working Group on the Social Cost of Greenhouse Gases.
- President Biden signed the Executive Order on Tackling the Climate Crisis at Home and Abroad (1/27/2021). Key components of this executive order include:
  - Centering the climate crisis in US foreign policy and national security.
  - Establishing multiple new entities: The White House Office of Domestic Climate Policy, the National Climate Task Force, the Civilian Climate Corps Initiative, the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization, the White House Environmental Justice Interagency Council, and the White House Environmental Justice Advisory Council.
  - Taking actions to "lead by example" such as converting to an all-electric federal fleet made by union workers from at least 50% American-made materials; pausing new oil and natural gas leases on public lands or offshore waters; and shifting fossil fuel subsidies to clean energy.
  - Setting goals such as conserving 30% of America's lands and oceans by 2030 and delivering 40% of the overall benefits of relevant federal investments to disadvantaged communities.

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<sup>3.</sup>https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-orderon-tackling-the-climate-crisis-at-home-and-abroad/

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# TIPS FOR GREENING YOUR OFFICE

David Fivenson, MD

What is a carbon footprint?

The Environmental Protection Agency (EPA) website (epa.gov) has many useful articles and tools to manage our carbon footprint (the amount of greenhouse gases [GHGs] emitted as a result of any set of activities) related to an individual person, household, business, medical practice, etc. <u>Here is their easy tool to estimate your practice's carbon footprint</u>.

What contributes to a medical practice's carbon footprint? Heating and cooling systems, computers, medical devices and all that packaging and shipping that has become part of today's medical office. All of these were produced using energy intensive equipment which is usually electrical and can be related back to the majority of our energy production being still from fossil fuels. CO<sub>2</sub> and GHG emissions thus a direct result of 'doing business'.

Below is a partial list of climate change mitigation strategies that can help lower medical practices GHG production. Many of these are included in articles from the International Journal of Women's Dermatology Special Edition on Climate Change, Volume 7, Issue 1, January 2021.

- Place recycling bins in convenient locations throughout the office.
- Turn off lights and machines at night.
- Install light-emitting diode (LED) light bulbs/fixtures.
- Install motion-activated switches for lights, sinks or toilets.
- Low or no flush toilets and urinals.
- Black out blinds to decrease need for excessive cooling or heating.
- Utilize smart plug strips for office equipment that must stay plugged in.
- Set electronics to sleep mode while not in use.
- Set air conditioners to 74 °F/24 °C and the heater to 68 °F/20 °C. Keeping heating and



cooling systems regularly maintained and changing/cleaning filters.

- Convert to a solar hot water heater. Many utility companies offer discounts and tax incentives when you install these. Consider buying solar panels to generate electricity if you have a suitable roof and will be in the building for at least ten years more.
- Use cold water for handwashing; hot water is not required for proper hygiene.
- Switch from disposable to reusable instruments.
- Use multi-dose vials when available.
- Offer charging ports to encourage patients and staff use of electric vehicles.
- Install bike racks outside the office to encourage carbonless transportation.
- Reduce travel for local, regional or national meetings by video conferencing.
- Purchase of carbon offsets to help decrease the carbon footprint of necessary travel.
- If you cannot convert directly to renewable energy sources for your office, see if your local power company offers 'community solar' which allows you to purchase your energy from their renewables arrays.
- Support organizations that focus on energy and habitat conservation.



# **GET INVOLVED AND TAKE ACTION!**

✓ Join the Health Voices for Climate Action Initiative and contribute your story on climate and health (<u>https://climatehealthaction.org/go/storytelling-resources/</u>).

✓ Consider sharing this video from our very own Misha Rosenbach (<u>https://bit.ly/2H2xCNu</u>).

✓ Get more involved with the ERG! Attend our upcoming Annual Meeting (see page 5 for details). We are developing task forces around medical education, divestment, greening your office, among other issues. Please let us know if you are interested in any of these initiatives by replying to: john.barbieri@pennmedicine.upenn.edu

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