Confronting climate change: 
Northwest Permanente in the 
environment of the future

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Abstract
The impacts of climate change are now being broadly realized world-wide. Global warming is affecting both the planet itself and the health of the people who live on the planet. The sobering reality is that as global warming continues to worsen, the resultant health, social, and financial effects will also continue to compound—creating a population health crisis at a global scale.

At Northwest Permanente, our mission is to deliver total health—to care for our members and the communities we serve. The only way for us to accomplish our mission in a climate-constrained future is to plan for potentially devastating environmental impacts now. Addressing climate change head-on will allow NWP to be a financially strong, proactive leader in social and environmental innovation, resilient to the growing disruptions of global warming, and well-positioned to fulfill our mission caring for our patients and the communities we serve.

To this end, NWP is developing a climate-action plan specific to our medical group’s operation within our region and will work with our strategic partners to optimize our impact in this region and beyond. Our plan is designed to:

- Ensure that the most vulnerable populations in our communities have a leading voice in planning for climate interventions
- Minimize our greenhouse gas (GHG) footprint and offset the carbon our core business creates
- Work with our business partners and vendors to insist on climate-smart facilities and operations
- Ensure the health of our supply chains by supporting local and regional purchasing and creating redundancies in our procurement practices
- Adapt our medical model to anticipate changing disease burdens our communities will face in the coming years secondary to climate impacts
- Work with our business partners to create back-up plans for insurance failures
• Make the case for climate-smart business as a strategy for financial solvency amidst growing uncertainty

• Take a leading stance as a medical group on the need for climate action.

Introduction
Global warming has very real consequences for NWP and our ability to fulfill our mission to improve the health of our members and the communities we serve. Increased seasonal weather volatility—including catastrophic wildfires and extreme weather events, increased risk to health-related infrastructure, new distributions of diseases, unexpected strains on insurance reserves, supply-chain interruptions, potential migration of populations, and uncertain economic health are all significant threats to the viability of NWP in the future.

In 2016, NWP became a certified B Corp to further commit to our values as a for-purpose and for-profit company. We fundamentally believe that to accomplish our mission of delivering total health to the communities we serve, we must create a system of care that bolsters the triple-bottom line of social, environmental, and economic value and recognizes health care as a fully integrated system.

We believe that the health of our community depends on the health of our environment and on eradicating institutional inequities that systemically impede populations from their health and well-being. We believe that education, affordable housing, stable access to healthy food, transportation, and livelihoods are essential to our health, as are joy, dignity, and the capacity for resilience.

Understanding and addressing the social determinants of health (SDOH) is core to the practice of Permanente Medicine—a foundation on which we are building to fully realize our B Corp charter. In fact, we have been honored to be recognized as “Best for the World” by B Lab, both for “Overall” performance as a company and for “People”—our workforce policies and practice—for two years running.

But in an age of increasing climate instability, we are falling far short on our commitment to the environment.¹ The climate crisis has reached an unprecedented tipping point that requires urgent action: According to an October 2018 special report by the International Panel on Climate Change (IPCC), the U.N. governing body for assessing climate change, we now have only 12 years to turn the tide on the most devastating impacts of global warming on human and

¹ In the process of B Corp accreditation, certification, and auditing, our lowest score has consistently been in the “Environmental” category. The reasons for this are clear: As NWP does not own or operate any of our buildings, we do not have control over many of the direct factors that contribute to our GHG emissions (i.e., Scope 1 and Scope 2 emissions). Where we do have opportunity is around more indirect, or Scope 3, emissions—those activities that are ancillary to running a business such as business travel, shipping, and meetings—as well as by exerting influence over our business practices and the medical field as a whole.
natural systems. This will require massive, multi-sectoral collaboration, and those of us in the health-care sector must play a leading role.

At NWP, we recognize that now is the time for us to take action on climate and be a leader among medical groups in social and environmental change. Although we face near-term institutional barriers to limiting our carbon footprint (via “Scope 1” and “Scope 2” emissions\(^2\) because we do not own or operate our own facilities), we can address our Scope 3 emissions by shifting our business practices towards a net-positive carbon outcome. Further, we have significant opportunities to influence our business partners and others in our field of practice.

**Climate change is a health-care crisis that demands medicine’s response**

The evidence is clear that greenhouse gas (GHG) emissions were on the rise from 1970 to 2010, with the largest increase in the last decade despite early mitigation policies (Allen, et al., 2018). However, the medical sector has been very slow to respond directly to this threat, despite the fact that the World Health Organization (WHO) estimates that seven million premature deaths annually are secondary to air pollution (World Health Organization, 2014).

**The health-care sector is one of the larger emitters of greenhouse gases**

Not only have medical professionals been slow to respond to the health effects of global warming, but in fact, the health-care industry is responsible for an immense amount of GHG creation—in effect, worsening the health of those we are supposed to serve. Hospitals, for a number of reasons, are some of the highest energy-using commercial buildings in the country (U.S. Energy Information Administration, 2012).

However, hospitals are only one active component of GHG formation related to the health-care sector. The manufacture of pharmaceuticals and medical devices, the removal of medical garbage, and the incineration of medical waste all use large quantities of energy and release significant amounts of GHG into the environment. In fact, the total increase in GHG formation over the past decade from the health-care sector in the United States is more than 30 percent, resulting in a cumulative 655 million metric tons carbon dioxide equivalents (MMT CO2) in 2013. **This amount represents nearly 10 percent of all GHG formation in the United States** (Eckelman MJ, 2016). If the health-care sector in the United States were a country, its

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\(^2\) Per the Greenhouse Gas Protocol, Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.
emissions would rank as the 13\textsuperscript{th} highest in the world, just in front of the United Kingdom (World Resources Institute, n.d.).

This enormous carbon burden has not gone unnoticed. The Institute of Medicine 2013 Workshop \textit{Summary Public Health Linkages with Sustainability} commented that “the health sector should lead by example by greening itself and reducing its ecological footprint … to improve global health and the health of the planet” (Institute of Medicine, 2013).

\textbf{The health impacts of climate change are on the rise}

Unfortunately, even if the health-care sector were able to clean up its act, the reality of global warming is already upon us. The average temperature in the United States has increased 1.3-1.9 degrees F since 1895, with most of this occurring since 1970. Asymmetric distribution of precipitation with heavy downpours and flooding have become more common in the Midwest and Northeast, with increasing drought, heat waves, and lengthier, more catastrophic fire seasons in the West (Crimmins, 2016).

These changing climate conditions of increased precipitation in some areas of the United States with warmer weather and longer summers, drought, and heat waves in other areas set the stage for serious health and environmental impacts. The first scenario is the perfect environment for certain disease vectors such as mosquitoes, and the second scenario is the perfect scenario for crop failures and wild fires (Crimmins, 2016).

In addition to direct health burdens such as insect-borne diseases and increased respiratory and cardiovascular disease, climate change presents significant population health risks as communities are displaced by extreme weather events and rising sea levels. The mental health implications of such displacement and “eco-anxiety” such as depression and suicidality are expected to continue to rise.

Further, vulnerable populations—people of color, those of lower socio-economic status, the elderly, chronically ill, and the very young—will be affected first and worst by climate change—calling for an even greater emphasis on addressing the social determinants of health as we plan for the growing impacts of climate change.

\textbf{Climate change presents new and accelerating disease vectors}

Changing weather patterns are increasing the spread of disease globally, with specific risks in some areas of the United States. Mosquito habitats are expanding, and with them diseases with
mosquito vectors are becoming more commonplace. As average temperatures warm, Zika virus outbreaks associated with unusually warm weather conditions will put the southeastern United States at risk (Caminade, et al., 2017) and globally, northern regions will become more susceptible to malaria during warmer years (Lyon, Dinku, Raman, & Thomson, 2017). Warmer temperatures are also associated with increased antimicrobial resistance by the malaria parasite, increasing the transmission of drug-resistant strains (World Health Organization, 2018; MacFadden, McGough, Fisman, Santillana, & Brownstein, 2018); while not yet directly affecting the United States to a significant degree, the trend is concerning.

Lyme disease from increased tick activity in the Northeast and Upper Midwest is on the rise, as is concern about West Nile Virus and Dengue Virus in locations such as California (Crimmins, 2016). Anticipating changes in the type and extent of climate-related health impacts, including pulmonary, cardiac, and infectious disease etiologies will be critical considerations for NWP.

The escalating threat of wildfires across the West

Here in the region NWP serves, wildfires are a serious concern. Large forest fires have increased in frequency and intensity across the West since the 1980s (Westerling, Hidalgo, Cayan, & Swetnam, 2006; Dennison, Brewer, Arnold, & Moritz, 2014; Abatzoglou & Williams, 2016). These fires generate harmful emissions (carbon dioxide, carbon monoxide, and methane), as well as particulate matter (PM) associated with pulmonary and cardiovascular disease, which can affect both short-term and long-term health (French N.H., 2016; Crimmins, 2016; Pierce, Val Martin, & Heald, 2017; Dennekamp, et al., 2015; Haikerwal, et al., 2015; Tinling, West, Cascio, Kilaru, & Rappold, 2016; Wettstein, et al., 2018). Climate models for California predict a possible doubling of wildfire emissions by the turn of the century (Hurteau M.D., 2014).

Particulate matter production from forest fires are a particular concern when it comes to public health: PM can travel far downwind to population centers (Sapkota, 2005). With wildfires on the rise, continued increases in the number of people who will suffer adverse health effects from wildfires is projected (Smith, et al., 2014; Parry, Canziani, Palutikof, van der Linden, & Hanson, 2007; Field, et al., 2014). Wildfire smoke exposures have been associated with premature death, a higher frequency of inpatient hospitalizations, and a higher rate of emergency department visits (Johnston, et al., 2012; Liu, Pereira, Uhl, Bravo, & Bell, 2015; Reid, et al., 2016).

In addition to acute respiratory events such as asthma exacerbations, there is growing evidence that exposure to forest fire PM may increase the risk of contracting an infectious condition (including but not limited to upper respiratory infections, bronchitis, and pneumonia), which often manifests at a later date. The high health risk among very young children is particularly worrisome because of the potential for long-term harm to children’s lung development.
Extreme weather conditions will also result in increased allergen formation and even more subsequent asthma flares (Crimmins, 2016).

**The growing financial costs of climate change**

Climate impacts are not only associated with increased risk of illness and associated health-care cost burdens but also increased costs on the economy overall. From 2007 to 2016, weather-related disasters in the United States increased by 46 percent (Hawkes, 2017). In 2017 alone, Hurricanes Harvey, Irma, and Maria combined for a total cost to the United States of up to $380 billion in damages and more than 200 deaths with direct causality (Willingham, 2017).

While these hurricanes and other extreme precipitation weather effects do not directly affect the Northwest, they can indirectly affect our service area in two ways: when impacted communities visit or migrate to the Northwest and create new demand, or when our supply chain is disrupted by damage caused to manufacturers or distributors of our medical supplies and pharmaceuticals.

**Supply chain disruptions and unrealized burden on health insurance and care delivery**

Extreme weather conditions could also lead to the destruction of manufacturing plants and businesses that are part of our supply chain. While we know that global warming will result in more and different illnesses for our population, and that here in the Northwest wildfires alone will result in immense economic loss along with both short- and long-term adverse health conditions, the health-care sector lacks a true understanding of climate risks and costs (Ceres, 2016).³

The threat of climate change to our business is real. Understanding that climate change threatens not just the health of our communities but the health of our very business itself is critical. The communities we serve will be at risk, as will our own financial viability. Addressing climate change is a win-win: Not only do we advance our mission to deliver health to our community, but we support the very people who provide a viable market for our business moving forward.

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³ A 2016 Ceres survey found that many U.S. health insurance companies have not realized the extent to which climate change will affect the insurance business.
Our future depends on our climate-resilience

Helping our communities become more resilient is, in and of itself, one tactic to help ensure our future. We help build societal resilience through our own actions, such as making appropriate changes in approaches to health-care delivery, working with our partners to ensure the construction of climate-resilient infrastructure, and with strategic plans that take into account climate-sensitive solutions (Farnier, Lovatt, & Oger, 2018).

By understanding the impact and inevitability of climate change, we will then have the opportunity to reduce risks, anticipate and predict future needs, and build resilience. For NWP, the notion of resilience becomes crucial: As a leader in health care of the future, NWP cannot afford to be vulnerable to climate change.

“All companies can take action in areas under their direct control to build climate resilience and benefit health at the same time. They can also enable and influence other companies, partners, individuals, and policymakers by incentivizing, partnering, and communicating with others in their industry and supply chains—thereby influencing the broader market.” (Farnier, Lovatt, & Oger, 2018)

Now is the time for broad and multi-sector climate action from the business community, including medical groups. What does climate-action look like for NWP? To start, it is clear that responsible companies must understand and attempt to mitigate their own carbon footprint to decrease GHG formation: Mitigating the carbon footprint of our business activities is an immediate opportunity—but we must also expect our business partners and suppliers to be accountable for their own resilience. This expectation is not something that most businesses currently have of their partners and suppliers, and it is a large gap in long-term resilience planning.

Beyond mitigation, businesses must identify the services that are most at risk to climate change, adapting “their quality-assurance systems, risk-management structures, and supply chain management practices to address these climate-related risks” (Farnier, Lovatt, & Oger, 2018). For NWP, risks to our ability to meet our mission-related goals in the future include disruptions to our supply chain (medical devices, pharmaceuticals, immunizations, etc.), increased illness load in the populations we serve, lack of planning for insurance-related financial failures, and financial ruin of the communities in which we practice.

Wider ranging risks to the health-care sector are more complex to address at an organizational level: Climate-change reductions in biodiversity (which may be a source of new medicines) and supplies of fresh water (needed in many manufacturing companies) will, at some point, have an indirect impact on NWP’s business and mission. However, to counter such risks, companies that understand the need to combine efforts and resources, increase public awareness of global warming impacts, ensure that frontline communities (those most likely to be asymmetrically affected by climate change) have leadership in resilience planning, build community engagement in climate action, and influence policy and legislation to address such risks will be best positioned to lead in a climate-constrained future (Farnier, Lovatt, & Oger, 2018).
Our business as a force for change: Committing to climate action

As a certified B Corp, NWP recognizes the importance of people and planet in addition to profit—a concept at the heart of solutions to surviving and even thriving in an age of global warming. Our B Corp values and corporate DNA are the foundation on which we can implement an effective climate action plan to ensure our viability in the age of climate change. Over the next five years, we are committed to developing and implementing a robust climate-action plan that not only will ensure our mission to deliver care to the communities we serve but also serve as a leading-edge example for others in our field of practice.

Our plan will be designed so that NWP can:

- Ensure that the most vulnerable populations in our communities have a leading voice in planning for climate interventions

We believe that the health of our community depends on the health of our environment, and on eradicating institutional inequities that systemically impede populations from their health and well-being. We believe that education, affordable housing, stable access to healthy food, transportation, and livelihoods are essential to our health, as are joy, dignity, and the capacity for resilience.

Those who will be most affected by climate change need representation at the table to help with mitigation plans; equity in such plans creates stronger resilience in the community as a whole.

Helping our communities become more resilient is, in and of itself, one tactic to help ensure our future. When we help build a healthier, socially resilient community through our own actions (such as making appropriate changes in approaches to health-care delivery or working with our partners to ensure the construction of climate-resilient infrastructure) we’re investing in the strongest asset we have to ensure both our mission and our financial viability over the long-term.

- Minimize our GHG footprint and offset the carbon our core business creates

As a health-care organization committed to improving the health of our patients and our communities, we need to recognize our GHG footprint and then reduce that footprint. As a Scope 3 company, we can reduce our footprint directly through actions such as reduced travel and shipping, prudent use of medical resources and testing, and by increasing the adoption of telehealth/virtual medicine.

Where we cannot directly reduce our output, we can purchase offsets to make our business carbon-neutral, and we need to encourage our business partners and other businesses to do the same.
• Work with our business partners and vendors to insist on climate-smart facilities and operations

Moving forward, we need our NWP leaders present at all levels of our service-area planning and preparation to ensure climate-smart decision-making. This need is as true for building our next hospital as it is for determining the robustness of pharmaceutical vendors to withstand climate-related assaults on our supply chains. We cannot simply assume that our vendors are active in resilience planning, nor that our business partners are prioritizing such decisions. We need to be proactive and bring these concerns into the meetings we attend, and in turn hold ourselves and others accountable to address climate impacts comprehensively.

Mitigating the carbon footprint of our business activities is an immediate opportunity—but we must also expect our business partners and suppliers to be accountable for their own resilience. This expectation is not something that most businesses currently have of their partners and suppliers, and it is a large gap in long-term resilience planning.

• Ensure the health of our supply chains by supporting local and regional purchasing and creating redundancies in our procurement practices

While hurricanes and other extreme precipitation weather effects do not always directly affect the Northwest, they can indirectly affect our service area in two ways: when impacted communities visit or migrate to the Northwest and create new demand, or when our supply chain is disrupted by damage caused to manufacturers or distributors of our medical supplies and pharmaceuticals.

Using our purchasing budgets to invest in local supply chains is an investment in the resilience of our region and our communities while helping to reduce our overall emissions and provide redundancy in case of natural disasters directly affecting distant suppliers or distribution channels.

• Adapt our medical model to anticipate changing disease burdens our communities will face in the coming years secondary to climate impacts

Global warming will result in more and different illnesses for our population; here in the Northwest wildfires alone will result in immense economic loss along with both short- and long-term adverse health conditions. Disaster response planning must be flexible and thorough, taking into account the needs of potential victims, as well as the caregivers and the infrastructure that will be required to respond. We need to be able to care for those who need our help as well as the caretakers. We will need to educate our clinicians on both short- and long-term expected changes in health related to climate-change-related disease. By understanding these trends and making proactive interventions, we will save lives, improve our clients’ quality of life, and improve our financial health as a business.
• Work with our business partners to create back-up plans for insurance failures and changing needs.

There will likely be insurance failures in the future due to reserves being too low to pay for claimed damages. We will need to plan for such a reality, either through diversification of insurance vendors or through self-insurance at adequate levels.

Likewise, the coverage provided by our regional health insurance products will need to be continually assessed for climate change-related options that will be requested in the future. Insurance products will likely be affected by global warming and we will need to maintain flexibility in benefit coverage design and make sure our business partners remain proactive, to ensure financial viability. Further, we will need to understand the potential health-related costs associated with climate change to our members, anticipate these costs and proactively intervene to mitigate such losses as we do now with other health conditions.

• Make the case for climate-smart business as a strategy for financial solvency amidst growing uncertainty.

The threat of climate change to our business is real. Understanding the threats of climate change are not just on the health of our communities, but on the health of our very business itself is critical. The communities we serve will be at risk, as will our own financial viability. Addressing climate change is a win-win: not only do we advance our mission to deliver health to our community, but we support the very people who provide a viable market for our business moving forward.

By understanding the impact and inevitability of climate change, we will then have the opportunity to reduce risks, anticipate and predict future needs, and build resilience. For NWP, the notion of resilience becomes crucial: As a leader in healthcare of the future, NWP cannot afford to be vulnerable to climate change.

• Take a leading stance as a medical group on the need for climate action.

Medical professionals have been slow to respond to the climate crisis. Yet, as Dr. Regina LaRocque pointed out in a recent interview on National Public Radio, "We are the most trusted sources of health information for people around the world and in this country. [It] is our responsibility to be 100% clear that this is a real threat to the health of our communities and our patients. We need to use our individual and collective voices to spread that message far and wide." Our voices as physicians and clinicians will be critical to advancing the kind of change needed both within our field of practice, but also in mobilizing the kind of cross-sectoral collaboration necessary to address the urgency that global warming presents. To this end, key leaders at Northwest Permanente will take a stance in our external affairs and public communications on the critical implications of climate on health and wellbeing, and work to influence policies and climate action by the medical community.
While this work will be long-term and comprehensive, our climate solutions must start now. And we can start with the Stockdale Paradox: “Hoping for the best, but preparing for the worst.” Although we remain hopeful that the world will come together to make the changes needed to limit global warming, we need to have a realistic understanding that this is unlikely to happen in the time frame that is needed to make a real difference. Thus, we must plan for climate change and prepare.

Conclusion
Climate change is real. The science behind climate change is robust and irrefutable. Climate change is already resulting in more powerful storms, rising sea levels, increased fires and seasonal changes fostering broader habitats for mosquitos and other disease-carrying vectors.

As a B Corp, we believe we are obligated to address the issue of climate change. Necessary actions include increasing energy efficiency and reducing greenhouse gas emissions (GHG’s), in order to keep global average temperature rises below 2°C by the end of the century in line with the 2015 Paris Agreement. Unfortunately, with every passing day it is more unlikely that the world will be successful in implementing the needed measures to prevent climate disaster. Lack of action has contributed, and will continue to contribute, to global health effects that are broad in consequence. Our very Mission states that we exist to improve the health of our members and the communities we serve.

We believe that NWP is obligated to help improve the health of our community and our world by doing our part to limit the production of GHG. We also believe that we need to implement a proactive, aggressive and broad-based plan of action to ensure our continued financial viability while improving our own resilience, as well as that of our communities, business partners and suppliers.

Finally, we are professionals dedicated to maintaining the health of our members and the communities we serve. We need to educate our providers on the changes that we will face regarding climate-related disease loads, make sure we will have the infrastructure and means to care for our patients needing care, and that we have emergency response plans in place that take into account the needs of our patients, our providers and our communities as a whole. To achieve these goals, we will need to hold ourselves, our business partners, and our supply chain providers accountable.
References


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'So, named after former prisoner of war Admiral James Stockdale, who was held captive for eight years during the Vietnam War.