Mindful Climate Action
mind-body trainings for eco-wellness

Bruce Barrett MD PhD, Dept Family Medicine & Community Health
Cathy Middlecamp PhD, Nelson Institute, Office of Sustainability
University of Wisconsin - Madison

Wisconsin Lakes Partnership Convention
Water Action Volunteers Symposium
April 12th, 2019
www.fammed.wisc.edu/mca/

Image courtesy of Jason Vargo 2016

www.myhealthylivingcoach.com/find-happiness-can-improve-health/
Eco-Wellness

Today’s talk will be about

Mindfulness trainings for **Co-benefits** of Mind-Body Health & Sustainability Behaviors
BUY LESS, LIVE MORE

http://www.fairforallguide.com/
2014/12/23/buy-less-live-more/

www.zifflaw.com

New Food Pyramid

- Limit intake of red meat & butter
- Limit high glycemic foods
- Multiple vitamins for most
- Eggs, fish, poultry, and plant proteins
- Nuts and seeds
- Plant oils
- Fruits
- Whole grains
- Legumes
- Low fat dairy, and soy milk
- Water, 5-8 glasses

Daily exercise and weight control

www.zifflaw.com
Mindful Climate Action - Core team

- Bruce Barrett MD PhD - Team leader, Family physician, Researcher
- Cathy Middlecamp PhD – Professor, Nelson Institute, Office of Sustainability
- Margaret Mooney MPA – Earth science educator, Meteorologist, CIMSS/SSEC
- Maggie Grabow PhD – Post-doctoral fellow, Environmental health researcher
- Alex Converse PhD – Physicist, Data analyst, Mindfulness researcher
- Mary Checovich MS – Project manager, Researcher
- Tom Bryan - Graduate student, Nelson Institute Environmental Studies
- Elisa Torres PhD – Professor, Univ Mississippi Medical Cntr, Exercise & mental health
- Roger Brown PhD – Statistician, Methodologist
- Cristalyne Bell MS – Research assistant, Family Medicine & Community Health
- Kristi Rietz OTR-L – Mindfulness teacher, Wellness program manager
- Carmen Alonso PhD – Mindfulness teacher, Psychotherapist
- Beth Wortzel PhD – Mindfulness teacher, Psychotherapist
- Amie Heeter – Mindfulness teacher, Yoga instructor
- Susan Andrae PhD - Assistant Professor, Kinesiology
- Markus Brauer PhD - Professor, Department of Psychology
- Simon Goldberg PhD – Assistant Professor, Counseling Psychology
Mindful Climate Action - Advisors

- Richard Davidson PhD - Director, Center for Investigating Health Minds
- Jonathan Patz MD MPH - Professor, Director, Author IPCC
- Jon Temte MD PhD – Clinician, Researcher, Professor
- Katherine Bonus MA – Founder, UW Mindfulness Program
- Michele Brogunier MD – Physician, Member PSR
- Julia Yates MSSW – Clinical social worker, Psychotherapist
- Dick Smith JD LLB – Retired Judge, Member Citizens Climate Lobby
- Tia Nelson – Director of Climate Program, Outrider Foundation, Madison WI
- Nancy Wong MBA PhD – Chair & Professor, Consumer Science & Retailing, SoHE
- Mike Berners-Lee - Director, Small World Consulting, England
Business & Community Partners

www.goodmancenter.org

www.promega.com

https://northsideplanningcouncil.org/

www.fusmadison.org
Concept Paper

Mindful Climate Action: Health and Environmental Co-Benefits from Mindfulness-Based Behavioral Training

Bruce Barrett 1,*, Maggie Grabow 1,2, Cathy Middlecamp 3, Margaret Mooney 4, Mary M. Checovich 1, Alexander K. Converse 5, Bob Gillespie 6 and Julia Yates 1

Article

Mindfulness and Climate Change Action: A Feasibility Study

Maggie Grabow 1,2, Thomas Bryan 3, Mary M. Checovich 1, Alexander K. Converse 4, Cathy Middlecamp 3, Margaret Mooney 5, Elisa R. Torres 6, Samuel G. Younkin 2 and Bruce Barrett 1,*
Low carbon Happiness, Health & well-being are possible

*Hypothesis:* People can be happy & healthy without over-consumption of high carbon goods & services

*Method:* Enhanced awareness & understanding of physical sensations, emotions, thoughts, and behaviors using mindfulness-based practices, will help to break unhealthy cycles, leading to greater health and happiness, and to lower carbon footprints
Greenhouse Gases

http://www.epa.gov/climatechange/images/ghgemissions/GlobalGHGEmissionsByGas.png

http://www.ecy.wa.gov/climatechange/images/greenhouse_effect2.jpg
Atmospheric CO$_2$ at Mauna Loa Observatory

Scripps Institution of Oceanography
NOAA Earth System Research Laboratory

PARTS PER MILLION

YEAR

http://www.esrl.noaa.gov/gmd/ccgg/trends/

Charles David Keeling (April 20, 1928 – June 20, 2005)
Average Temperatures of Earth’s Surface are Up ~1.0 °C (1.8 °F)

https://commons.wikimedia.org/wiki/File:Global_Temperature_Anomaly.svg
Climate Change: The IPCC Scientific Assessment 1990

Report prepared for Intergovernmental Panel on Climate Change by Working Group I
J.T. Houghton, G.J. Jenkins and J.J. Ephraums (eds.).
Cambridge University Press, Cambridge, Great Britain, New York, NY, USA and Melbourne, Australia
410 pp.
Observed & adjusted temperatures relative to 1990, with models from IPCC (Intergovernmental Panel on Climate Change)

Comparing climate projections to observations up to 2011.
Rahmstorf, Foster & Cazenave *Envir Research Let* 2012
According to a recent poll by the Yale Program on Climate Change Communication

- 73% of Americans think global warming is happening, an increase of 10% since March 2015
- 62% understand that global warming is mostly human-caused
- 69% say they are at least “somewhat worried” about global warming
- 46% say they have personally experienced the effects of global warming
- 14% think it’s too late to do anything about it

Billions of tons of carbon emitted 1950-2000

Mortality consequences of global warming & climate change

You can always count on Americans to do the right thing - after they've tried everything else.

Winston Churchill
“The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years.”


http://www.esrl.noaa.gov/gmd/aggi/aggi.html
Climate change 2014: Impacts, adaptation, and vulnerability
Intergovernmental Panel on Climate Change. IPCC Working Group 2.
“Climate change is the greatest threat to global health in the 21st century.”

“Health professionals have a duty of care to current and future generations. You are on the front line in protecting people from climate impacts - from more heat-waves and other extreme weather events; from outbreaks of infectious diseases such as malaria, dengue and cholera; from the effects of malnutrition; as well as treating people that are affected by cancer, respiratory, cardiovascular and other non-communicable diseases caused by environmental pollution.”

WHO calls for urgent action to protect health from climate change

Review

Climate change, human health, and epidemiological transition

Bruce Barrett¹, Joel W. Charles, Jonathan L. Temte

University of Wisconsin School of Medicine and Public Health, Department of Family Medicine, University of Wisconsin—Madison, 1100 Delafield Street, Madison, WI 53715, United States.

https://aslatthedirt.files.wordpress.com/2017/02/climate-health.jpg?w=636

www.unep.org/climatechange/adaptation/
Climate Change

www.stockinvestor.com/30126/
sitting-investings-doom-gloom/

Solutions

WELLNESS, HAPPINESS & LIGHT


https://happinessloveandlight.com/2016/07/05/
reconnecting-with-your-inner-light/
Mitigation Co-benefit Opportunities
Co-Benefits = “win-win” scenario

Health co-benefits and risks of public health adaptation strategies to climate change: a review of current literature

June J. Cheng, Peter Berry

How the low carbon economy can improve health

Health professionals are uniquely placed to guide the climate change conversation towards better policies that are good for the planet and for people, say Andy Haines and Carlos Dora

Andy Haines professor of public health and primary care, Carlos Dora co-ordinator

Plenaries

Health benefits of a low carbon economy

A. Haines

Implications of incorporating air-quality co-benefits into climate change policymaking

G F Nemet, T Holloway, and P Meier

Co-benefits of mitigating global greenhouse gas emissions for future air quality and human health

J. Jason West, Steven J. Smith, Raquel A. Silva, Vaishali Naik, Yuguang Zhang, Zacharieh Adelman, Meridith M. Fry, Susan Anenberg, Larry W. Horowitz, and Jean-Francois Lamarque

The health co-benefits of climate change policies: doctors have a responsibility to future generations

Ian Roberts

MITIGATION POLICY

Health co-benefits

Efforts to tackle climate change have met significant financial and political barriers that have been difficult to overcome. Research now shows that such measures are justified on grounds other than mitigation of climate change.

George D. Thurston

CLIMATE CHANGE

Clinical Medicine 2009, Vol 9, No 3: 212–13

news & views

Climate change

The health co-benefits of climate change policies: doctors have a responsibility to future generations

Ian Roberts

Implications of incorporating air-quality co-benefits into climate change policymaking

G F Nemet, T Holloway, and P Meier

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1 Nelson Institute Center for Sustainability and the Global Environment (SAGE), University of Wisconsin–Madison, Madison, WI, USA
2 La Follette School of Public Affairs, University of Wisconsin–Madison, Madison, WI, USA
3 Energy Institute, University of Wisconsin–Madison, Madison, WI, USA
What would happen if people walked & biked instead of drove, half of the time, for trips of 5 miles or less, in 11 metropolitan areas in the US midwest?

Maggie Grabow MPH PhD
Air Quality and Exercise-Related Health Benefits of Reduced Car Travel in the Midwestern United States
Grabow et. al

- Mortality declines regionally by 1,295 deaths/year
- Economic benefits exceeds $8.7 billion annually
- Health benefits in downwind rural areas
- Reduction greenhouse gases
- Small changes in air quality = Large health benefits
Current health impacts of fossil fuel combustion (main cause of climate change)

- **Outdoor air pollution** → 3.7 million deaths/yr – mostly from urban exposures
- **Indoor air pollution** → 4.3 million deaths/yr – mostly from inefficient biomass and coal cookstoves

*Courtesy: J.Patz & D.Campbell-Lendrum, WHO*
A systems approach to evaluating the air quality co-benefits of US carbon policies

Tammy M. Thompson¹*, Sebastian Rausch¹†, Rebecca K. Saari² and Noelle E. Selin²,³

Because human activities emit greenhouse gases (GHGs) and conventional air pollutants from common sources, policy designed to reduce GHGs can have co-benefits for air quality that may offset some or all of the near-term costs of GHG mitigation. We present a systems approach to quantify air quality co-benefits of US policies to reduce GHG (carbon) emissions. We assess health-related benefits from reduced ozone and particulate matter (PM$_{2.5}$) by linking three advanced models, representing the full pathway from policy to pollutant damages. We also examine the sensitivity of co-benefits to key policy-relevant sources of uncertainty and variability. We find that monetized human health benefits associated with air quality improvements can offset 26-1050% of the cost of US carbon policies. More flexible policies that minimize costs, such as

“...health benefits...can offset 26-1050% of the cost of US carbon policies”
Mindful Climate Action

Our Goal:

To demonstrably influence behaviors to substantively reduce individual carbon footprints, and to do so in a way that fosters human health and happiness.
Mindfulness based stress reduction

MBSR

Pioneered by Jon Kabat-Zinn PhD
Center for Mindfulness in Medicine, Health Care
University of Massachusetts Medical School
from Denial to Mindful Climate Activism
<table>
<thead>
<tr>
<th>Week</th>
<th>MBSR Topic</th>
<th>Practices Learned</th>
<th>MCA Weekly Topic</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cultivating Beginner’s Mind and Non-judging (<em>Simple Awareness</em>)</td>
<td>Mindful eating, Breath Awareness, Body Scan</td>
<td>Mindful Eating; Healthy and Sustainable Diets</td>
<td>Develop awareness of the varying environmental and health impacts of food</td>
</tr>
<tr>
<td>2</td>
<td>Cultivating Non-striving (<em>Attention and The Brain</em>)</td>
<td>Loving Kindness Meditation</td>
<td>Water Considerations for Sustainable Lifestyles</td>
<td>Learn and understand the many implications of a changing climate on water scarcity</td>
</tr>
<tr>
<td>3</td>
<td>Cultivating Acceptance (<em>Dealing with Thoughts</em>)</td>
<td>Mindfulness within movement, Hatha Yoga, Walking Meditation</td>
<td>Walking Meditation, Exercise, and Active Transport</td>
<td>Gain understanding of multiple benefits of active transportation and motivate participants to choose active modes of transport whenever possible</td>
</tr>
<tr>
<td>4</td>
<td>Cultivating Patience (<em>Stress: Responding vs. Reacting</em>)</td>
<td>Sitting meditation</td>
<td>Energy Conservation</td>
<td>Make connections between daily activities and energy use and understand the benefits of reducing energy consumption; Learn how to relate to both pleasant and unpleasant experiences</td>
</tr>
<tr>
<td>5</td>
<td>Cultivating Letting Go (<em>Dealing with Difficult Emotions/Sensations</em>)</td>
<td>Sitting meditation</td>
<td>Climate Connections Across Time and Space</td>
<td>Develop awareness of the connectedness of all living beings and ecosystems</td>
</tr>
<tr>
<td>6</td>
<td>Cultivating Trust (<em>Mindfulness and Communication</em>)</td>
<td>Compassion for the conditioned mind, Mindful movement Part 2</td>
<td>Ethical considerations and observed inequities in the causes and consequences of climate change</td>
<td>Develop awareness of broader impacts of climate change on those least responsible</td>
</tr>
<tr>
<td></td>
<td>(retreat)</td>
<td>Mindful movement, Sitting meditation, Breathing Exercises, Fast Walking, Laughing Meditation, Compassion</td>
<td></td>
<td>Foster contemplative insight and strengthen a sense of connectedness to other people and the world around us</td>
</tr>
<tr>
<td>7</td>
<td>Cultivating Forgiveness (<em>Mindfulness and Compassion</em>)</td>
<td>Sitting meditation with choiceless awareness (<em>Metta</em>) Loving Kindness meditation</td>
<td>Personal and Planetary Well-Being; Purchasing and Consumption</td>
<td>Understand concepts of desire and fulfillment, motivation, striving, purchasing, and the cycle of wanting and reward in context of actual need, temporary pleasure, and lasting happiness</td>
</tr>
<tr>
<td>8</td>
<td>Sustaining Practice in Times of Transition (<em>Conclusion</em>)</td>
<td>Self-directed yoga and mindful movement</td>
<td>Mindful Climate Learnings</td>
<td>Discuss how to keep the momentum of mindful climate action going in every-day lives; Reflect on the significance of always making sustainable choices</td>
</tr>
</tbody>
</table>
Drive less
Walk & bike more

www.theoildrum.com

www.zifflaw.com

www.flickr.com
MOVES App
Activity Storyline ➔

Tue, Oct 28

Run
2.6 mi

Walk
4.0 mi

Cycle
4.3 mi

Travel Mode Distance Summary ➔
MOVES App Activity Map by Transportation Mode
Table 2. MCA participant Moves app data (n = 5) descriptive statistics for the entire study period.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Unit</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
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</thead>
<tbody>
<tr>
<td>Walk</td>
<td>Hours/week</td>
<td>1.81</td>
<td>2.18</td>
<td>0.95</td>
<td>0.61</td>
<td>2.87</td>
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<tr>
<td></td>
<td>Miles/week</td>
<td>1.55</td>
<td>1.75</td>
<td>0.86</td>
<td>0.48</td>
<td>2.42</td>
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<tr>
<td></td>
<td>Average mph</td>
<td>0.84</td>
<td>0.80</td>
<td>0.07</td>
<td>0.79</td>
<td>0.95</td>
</tr>
<tr>
<td>Run</td>
<td>Hours/week</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Miles/week</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Average mph</td>
<td>2.01</td>
<td>2.01</td>
<td>0.42</td>
<td>1.71</td>
<td>2.32</td>
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<tr>
<td>Cycle</td>
<td>Hours/week</td>
<td>0.42</td>
<td>0.29</td>
<td>0.51</td>
<td>0.00</td>
<td>1.09</td>
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<tr>
<td></td>
<td>Miles/week</td>
<td>1.28</td>
<td>1.14</td>
<td>1.45</td>
<td>0.01</td>
<td>2.82</td>
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<tr>
<td></td>
<td>Average mph</td>
<td>3.11</td>
<td>2.93</td>
<td>0.61</td>
<td>2.60</td>
<td>3.97</td>
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<tr>
<td>Motor Vehicle</td>
<td>Hours/week</td>
<td>5.85</td>
<td>3.85</td>
<td>3.78</td>
<td>2.85</td>
<td>11.50</td>
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<tr>
<td></td>
<td>Miles/week</td>
<td>93.96</td>
<td>82.89</td>
<td>62.74</td>
<td>34.72</td>
<td>185.17</td>
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<tr>
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<td>Average mph</td>
<td>19.33</td>
<td>13.45</td>
<td>16.35</td>
<td>7.21</td>
<td>48.05</td>
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Article
Mindfulness and Climate Change Action: A Feasibility Study

Maggie Grabow 1,2, Thomas Bryan 3, Mary M. Checovich 1, Alexander K. Converse 4, Cathy Middlecamp 3, Margaret Mooney 5, Elisa R. Torres 6, Samuel G. Younkin 2 and Bruce Barrett 1, e
Mileage converted to CO2 carbon footprint (CF) using make/model/year of personal auto and U.S. EPA published data.
### Psychosocial Health from Self-Report Validated Instruments

<table>
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<th>Month 0</th>
<th>Month 2</th>
<th>Month 4</th>
<th>Month 6</th>
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<td>( n )</td>
<td>16</td>
<td>13</td>
<td>12</td>
<td>13</td>
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<tr>
<td>Mean</td>
<td>11.1</td>
<td>10.8</td>
<td>13.3</td>
<td>9.7</td>
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<td>SD</td>
<td>5.7</td>
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<td>Minimum</td>
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<td>2.0</td>
<td>0.0</td>
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<tr>
<td>Median</td>
<td>8.0</td>
<td>9.0</td>
<td>10.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>21.0</td>
<td>26.0</td>
<td>35.0</td>
<td>23.0</td>
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<td><strong>SPS-6</strong></td>
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<td>( n )</td>
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<td>13</td>
<td>13</td>
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<td>Mean</td>
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<td>23.5</td>
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<td>24.1</td>
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<td>SD</td>
<td>3.7</td>
<td>3.8</td>
<td>4.2</td>
<td>4.2</td>
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<tr>
<td>Minimum</td>
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<td>14.0</td>
<td>15.0</td>
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<tr>
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<td>24.0</td>
<td>24.0</td>
<td>25.0</td>
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<tr>
<td>Maximum</td>
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<td>29.0</td>
<td>28.0</td>
<td>30.0</td>
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<tr>
<td><strong>PHI</strong></td>
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<td></td>
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<td>( n )</td>
<td>16</td>
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<td>13</td>
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<td>Mean</td>
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<td>86.8</td>
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<td>13.6</td>
<td>19.2</td>
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<tr>
<td>Minimum</td>
<td>58.0</td>
<td>50.0</td>
<td>53.0</td>
<td>49.0</td>
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<tr>
<td>Median</td>
<td>91.5</td>
<td>92.5</td>
<td>94.0</td>
<td>98.0</td>
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<tr>
<td>Maximum</td>
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<td>( n )</td>
<td>15</td>
<td>14</td>
<td>*</td>
<td>14</td>
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<tr>
<td>Mean</td>
<td>16.2</td>
<td>13.8</td>
<td>*</td>
<td>12.0</td>
</tr>
<tr>
<td>SD</td>
<td>5.3</td>
<td>6.1</td>
<td>*</td>
<td>5.2</td>
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<tr>
<td>Minimum</td>
<td>8.0</td>
<td>5.0</td>
<td>*</td>
<td>3.0</td>
</tr>
<tr>
<td>Median</td>
<td>16.0</td>
<td>13.0</td>
<td>*</td>
<td>13.5</td>
</tr>
<tr>
<td>Maximum</td>
<td>27.0</td>
<td>25.0</td>
<td>*</td>
<td>20.0</td>
</tr>
</tbody>
</table>
As part of the Medical Outcomes Study (MOS), a multi-year, multi-site study to explain variations in patient outcomes, RAND developed the 36-Item Short Form Health Survey (SF-36)
Personal & Household Energy Use

Use your Thermostat
To save energy

Sweaters and Long underwear in Winter
Shortsleeves and Shorts in Summer

Do you really need that air conditioner?
www.pca.state.mn.us/news/
five-high-impact-actions-you-can-take

http://www.fairforallguide.com/2014/12/23/buy-less-live-more/
Eat lower on the food chain

www.bbc.co.uk

digestiondarryltan2h.blogspot.com

www.businessinsider.com
Foodprints by Diet Type: t CO$_{2}$e/person

Note: All estimates based on average food production emissions for the US. Footprints include emissions from supply chain losses, consumer waste and consumption. Each of the four example diets is based on 2,600 kcal of food consumed per day, which in the US equates to around 3,900 kcal of supplied food.

Sources: ERS/USDA, various LCA and EIO-LCA data

http://www.greeneatz.com/foods-carbon-footprint.html
If meat consumption was halved in the UK, GHGs could be reduced by 25–40% and intake of saturated fat could fall by 40%.

Westhoek, 2014

Heart disease burden could fall by 15%.

Friel, 2009

Diet and GHG Emissions

Slide courtesy J. Patz

Data from Scarborough et al. 2014
Did you know that cow protein’s C.F. is 36x greater than peas?

The two ingredients necessary to calculate an individual’s dietary environmental footprint are:

1) Food intake records (ASA24) with unique 8-digit food ID
2) Environmental impact data (Poore & Nemeck, 2018)

Tom Bryan created an all-new diet calculator that tracks with 7 eco-impact categories to environmental impacts.

Making Data Matter!
8-digit codes used by FNDDS, NAHNES, and ASA24

Poore and Nemecek 2018 impact data

Relational database between codes and impact ("environmental impact calculator")

Graduate student Tom Bryan’s calculator of
Carbon footprint using ASA24 data

Table 1. Summary of the carbon footprints (kg CO₂e) of the nine participants with pre, during, and post ASA24 logs. The calculator used eco-invent and FoodCarbonScope as the data sources.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline CF (kg CO₂e)</th>
<th>During MCA CF (kg CO₂e)</th>
<th>Follow-Up CF (kg CO₂e)</th>
<th># of Items Logged</th>
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<tbody>
<tr>
<td>B</td>
<td>3.0</td>
<td>1.3</td>
<td>3.7</td>
<td>204</td>
</tr>
<tr>
<td>C</td>
<td>0.9</td>
<td>0.9</td>
<td>1.6</td>
<td>121</td>
</tr>
<tr>
<td>D</td>
<td>1.5</td>
<td>1.2</td>
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<tr>
<td>E</td>
<td>2.2</td>
<td>0.7</td>
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sustainability

Concept Paper

Mindful Climate Action: Health and Environmental Co-Benefits from Mindfulness-Based Behavioral Training

Bruce Barrett 1,*, Maggie Grabow 1,2, Cathy Middlecamp 3, Margaret Mooney 4, Mary M. Checovich 1, Alexander K. Converse 5, Bob Gillespie 6 and Julia Yates 1
Scaling Up MINDFUL CLIMATE ACTION business plan

market MCA trainings to:

1) Businesses ↓ energy costs ↓ absenteeism ↑ worker productivity

2) Community and faith-based organizations mission & moral mandate

3) Educational institutions educational mission & innovation

4) General Public in-person courses & web-based learning
Potential future funders...
Expanding MCA Program