

IN NEW YORK...

**ADDRESSING HEALTH IMPACTS ASSOCIATED WITH
THE EXTRACTION, PRODUCTION,
TRANSPORT AND USE**

Larysa Dyrszka MD

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June, 2016

NEW YORK...ADDRESSING HEALTH IMPACTS ASSOCIATED WITH THE EXTRACTION, PRODUCTION, TRANSPORT AND USE OF FOSSIL FUELS

- Impacts on people and animals
- Theo Colborn
- Varied messages, but united
- GASLAND
- Home rule
- SEQRA process in NYS
- Letters to Governor Cuomo
- The medical community
- Demand HIA
- Research
- Citizen science
- CHPNY Compendium
- Ban on fracking
- but...O&G infrastructure proliferating

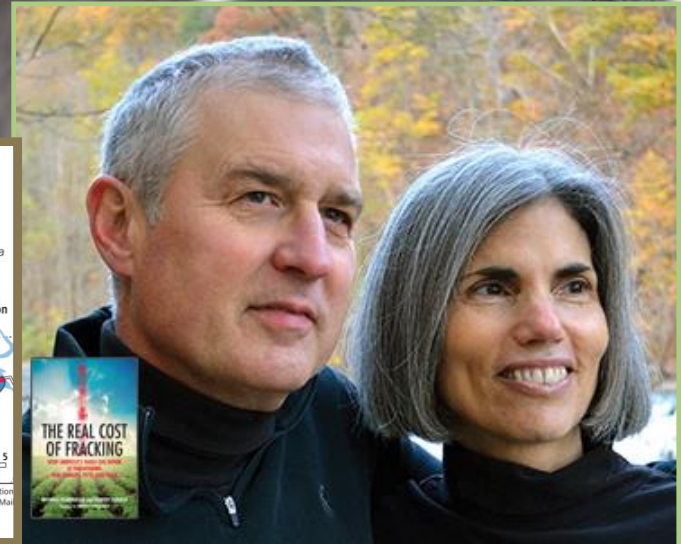
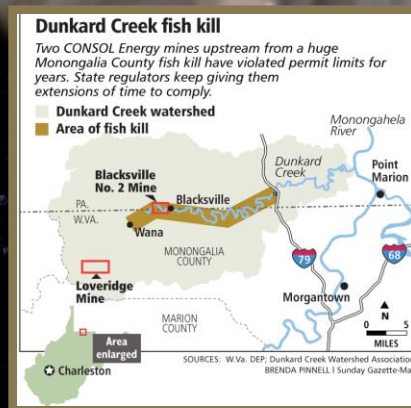
- People and animals around gas exploration and production sites were getting sick

List of the Harmed compiled by
Jenny Lisak, Co-director of PACWA
Pennsylvania Alliance for Clean Water and Air

Breathe Easy Susquehanna County

21,557 impacted as of March 25th, 2016

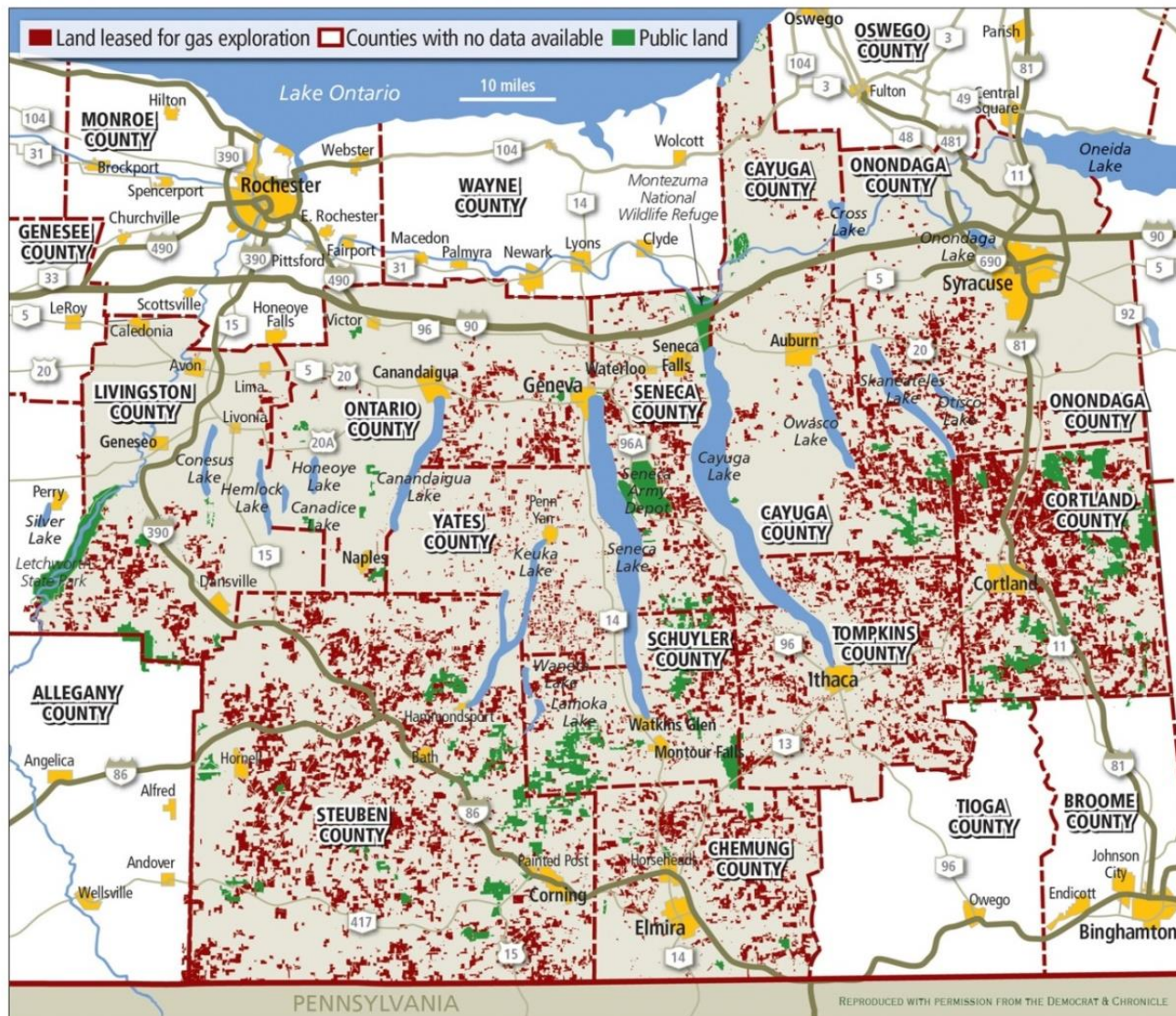
FLIR



■ Land in NY was being leased

The Finger Lakes region is dotted with properties whose owners signed leases with natural gas exploration companies. Nearly 30 percent of the acreage in eight Finger Lakes counties was leased between 2005 and 2010,

according to a study by Citizens Campaign for the Environment. Similar county-level studies were done by three other groups. Counties with no red parcels, including Monroe and Wayne, were not included in the studies.



SOURCES: Citizens Campaign for the Environment; Yates County Marcellus Shale Task Force; Neighbors of the Onondaga Nation (Onondaga County); Marcellus Accountability Project for Tompkins County. KEVIN M. SMITH/GRAPHICS EDITOR

- Theo Colborn documented chemicals used at gas exploration sites





American Academy of Pediatrics, District II, New York State
Dedicated to the Health of All Children

Contact:

June 7, 2010

Elie Ward,
Director of Policy & Advocacy
eward@aap.net
518-441-4544

Memo of Support

A. 10490/S. 7592

An act to establish a moratorium on conducting hydraulic fracturing for extraction of natural gas or oil in New York State until 120 days after the Environmental Protection Agency issues a report on the effects of hydraulic fracturing on water quality, air quality and other public health impacts.

The American Academy of Pediatrics, District II, NYS, representing more than 6,000 pediatricians and the millions of children we care for across the state, strongly supports A10940/S7592.

This legislation provides an opportunity for the EPA to study the potential public health impacts of hydraulic fracturing, and for New York State's leaders to have that information before it makes any decision about permitting hydraulic fracturing in our state.

AAP, District II, NYS membership is concerned about the potential negative impacts on water, air, soil contamination, increased traffic and possible spills of contaminated materials in areas where many children and families live. Allowing time for the EPA study will allow our state leaders to move forward on this issue fully informed about whether hydraulic fracturing is a good public policy for our state.

We urge the legislature to pass this legislation now, imposing the moratorium to provide the time to for our state leaders to have the latest EPA data to inform our decisions going forward.

■ Citizen groups with varied messages and methods...





NONVIOLENT CIVIL DISOBEDIENCE

-
- A large group of people, mostly older adults, are gathered for a protest against fracking. They are holding up numerous signs and banners. The signs include: "Drilling isn't safe" (red circle with a slash), "Renewable Energy Now!", "BAN FRACKING", "Don't Frack", "New York WZ MNT 2 B FRACK-FREE", "FRACKING IS A CRIME" (handwritten in red), "DON'T BE A MOTHER" (with a globe icon), "BAN FRACKING" (in green letters), "DON'T FRACK WITH OUR FUTURE" (with a photo of a man), "PEOPLE PLEDGE TO RESIST FRACKING" (large white banner), and "FRACK" with a red X over it. Some signs also mention "KEEP YOUR FUTURE OUT OF N.Y." and "TEXT 'FRACK' TO 65566". The protesters are dressed in winter clothing, and the scene is indoors with bright overhead lights.

The medical community was among them, raising concerns in this first letter to the NYS Health Commissioner

February 28, 2011

Nirav R. Shah, M.D., M.P.H.

Commissioner, New York State Department of Health
Corning Tower
Empire State Plaza,
Albany, NY 12237

Dear Dr. Shah:

Congratulations on your appointment as Commissioner of New York State's Department of Health. We wish you much success in this important position.

Physicians, researchers and other representatives of the undersigned organizations would appreciate the opportunity to meet with you on an issue we believe is the most pressing health issue confronting our State. This is the near-term prospect of massive unconventional gas drilling in upstate New York and its potential for significant adverse impacts on the health of citizens throughout the State. We would like to discuss this issue and the pivotal role that the DOH must play in the consideration and study of the health impacts of unconventional gas drilling.

The NYS Department of Environmental Conservation is in the process of revising its draft "Supplemental Generic Environmental Impact Statement" (the "dSGEIS") regarding the new technology of "high water volume horizontal fracturing" ("hydraulic fracturing"). The potential health impacts associated with the life-cycle of hydraulic fracturing were almost completely overlooked in the dSGEIS despite numerous reports of health-related concerns in other parts of the country where hydraulic fracturing is on-going (1). Over 13,000 comments were submitted to the DEC regarding the dSGEIS. Concerns about the health impacts of hydraulic fracturing were a recurrent theme as was the fact that no cumulative impact study has been undertaken. Our regional office of the EPA, for example, concluded that "potential impacts to human health and the environment...warrant further scientific and regulatory analysis," expressing particular concern about local and regional air quality, water quality and radioactive materials disturbed during drilling.

Medical and Scientific Societies, Organizations and Professionals

Allied Pediatrics of New York, LLC, Gary Minkin, MD, CEO (75+ pediatricians),
Long Island/Groton, NY
American Academy of Pediatrics District II
Dorcas Pacific, MD, MPH, Chair, Department of Public Health and Preventive Medicine, Director,
CNYMHP Program, SUNY Upstate Medical University
Michelle Bamberger, MS, DVM, Veterinarian, Ithaca, NY
Claire L. Barnett, MBA, Founder and Executive Director, Healthy Schools Network, Inc.
Paul Bernaschko, MD, Ulster County, NY
Ronald Bieding, PhD, CHD, State University of New York at Oswego
Sarah Buehler, MD, critical care nurse, founder of Water POWER (Protecting Our Water Rights)
Broome County Medical Society
Thom Colburn, PhD, President, The Endocrine Disruption Exchange
Cortland County Board of Health
Daria Barrett Critesmith, MD, New York, NY
Nicholas Cunningham, MD, Dr.P.H., Pediatrician and Public Health Physician, Springfield, NY
Douglas DeLong, MD, Chief, Division of General Internal Medicine, Bassett Healthcare Network
Layna Deyoung, MD, Pediatrician, Bethel, NY
Joan C. Farber, PhD, clinical psychologist (retired), New York, NY
Clare Fennell, D.Phil., Associate Professor of Pharmacology, College of Veterinary Medicine,
Cornell University
Donna Hayhan, PhD, Director, The Lower Manhattan Public Health Project Professor, State
University of NY at New Paltz
Amy E. Fureth, MD, Attending, Department of Endocrinology Medical Director, Comprehensive
Diabetes Program Research Scientist, Bassett Healthcare Network, Cooperstown, NY
Suzanne Hammer-Goodman, MD, RN, CHW, Ithaca, NY
David Gould, MD, MBA, New York, NY
Irene Hoffman, MD, FACP, Clinical Associate Professor of Medicine, NYU School of Medicine
Robert W. Howarth, PhD, The David R. Atkinson Professor of Ecology and Environmental Biology
at Cornell University
Susan Hyman, MD, FACP, Developmental Pediatrician, Rochester, NY
Anthony R. Ingaffia, PhD, PE, Dwight C. Baum Professor of Engineering, Weits Presidential
Teaching Fellow, Cornell University
Kenneth Jaffe, MD, Slope Farms, Meredith, NY
William Krapack, MD, Dryden Family Medicine, Dryden, NY
Bruce G. Kerneroff, DVM, PhD, DACVIM (Cardiology), Senior Research Associate, Department of
Clinical Sciences, NYS College of Veterinary Medicine, Cornell University
Adam Lee, MD, Endocrinologist, Ithaca, NY
Robin R. Leges, RN, MS, PhD
Eric London, MD, Psychiatrist and Autism Researcher, Harris, NY
Judith Madenbaum, PhD, Psychologist, New York, NY
Mary Mangano, PhD, Women's Services, Upstate Medical University, Syracuse, NY
Mr. Sinai Global Health Training Center, Natcha Anandaram, MD, MPH, Director
Mr. Sinai School of Medicine Children's Environmental Health Center, Philip Landrigan, MD, MSc,
Director, Ethel H. Wisc Professor and Chairman, Department of Preventive Medicine;
Professor of Pediatrics, Dean for Global Health
Bela Oroszko, MD, Bronx, NY
Robert E. Oswald, PhD, Professor of Molecular Medicine, Cornell University
Vincent M. Padua II, MD, Integrative & Preventive Medicine, Medical Director, Pedre Integrative
Health, Clinical Instructor, Mount Sinai School of Medicine
Nina Pessenti, MD, Vestal, NY
Peter Rosenburg, MD, Public Health Director, retired, Steering Committee, Highland Coalition
Stanley R. Sabbe, PhD, Professor Emeritus Biology, City University of New York, Deposit, NY
William R. Sawyer, PhD, D-ABFM, D-ABE, TCAS Toxicology Consultants and Assessment
Specialists, LLC, Skaneateles, NY
Stephen S. Schneider, DDS, Oral & Maxillofacial Surgeon, Deposit, NY
Nadia Shengul, LCSW, New York, NY
Ted Schrier, MD, MPH, Science and Environmental Health Network
Kenneth R. Spahr, MD, MPH, Director, Occupational and Environmental Medicine Center; Director of Education,
Department of Population Health, North Shore University Hospital, Hofstra School of Medicine
Sandra Steingraber, PhD, Professor Emerita & Special Lecturer, Mailman School of Public
Health, Columbia University; Professor of Environmental & Occupational Health Sciences
and Professor of Neurology, SUNY Downstate Medical Center
Daniel Thau Tittelbaum, MD, Colorado
Tompkins County Medical Society
Gregory A. Weiland, PhD, Associate Professor of Pharmacology, Department of Molecular
Medicine, College of Veterinary Medicine, Cornell University
Wayne G. Whitmore, MD, FACS, New York, NY
Nora J. Wisard, DVM, PhD, Groton, NY
World Information Transfer, Inc, Dr. Christine K. Durbak, Chair and CEO

Community and Environmental Organizations

Advocates for Cherry Valley, Inc. (Lynne Marsh)
Advocates for Springfield (Harry Levine)
Binghamton Regional Sustainability Coalition (Chris W. Burger)
Catskill Citizens for Safe Energy (Bruce Ferguson)
Catskill Mountainkeeper (Kathleen Nolan, M.D., MSc)
Chemango Community Action for Renewable Energy (Eric Heaton)
Chemango Delaware Otsego Gas Drilling Opposition Group
Citizens Energy and Economics Council of Delaware County
Coalition to Protect New York (Jack O'neill and Kate Bartholomew)
Community Environmental Defense Council, Inc. (David Skottje, J.D.)
Concerned Citizens of Ulster (Michelle Bamberger)
Croton Watershed Clean Water Coalition, Inc. (Fay Mait)
Damascus Citizens for Sustainable (Barbara Arvidson)
Delaware Action Group (Caroline Martin)
Delaware Riverkeeper Network (Tracy Calceci)
Earthworks Oil & Gas Accountability Project (Nadia Steiner)
Food & Water Watch (Eric Wetman)
Frack Action (Claire Sandberg)
Frack Action Buffalo (Patricia Carson)
Friends of Vestal (Sue Rapp)
Gas Drilling Awareness Coalition (Tom Junta, D.P.M.)
Gas Drilling Awareness for Cortland County (Shirley Cohen, Ed.D.)
Highland Concerned Citizens (Debra Conway)
Homeschool School Green Power Alliance (Kate Bartholomew)
Landowners Against Natural Gas Drilling (Terese Winchester)
Lexington Cooperative Market - Buffalo (Tim Bartlett)
Lumberland Concerned Citizens (Peter Conner)
Marcellus Accountability Project for Tompkins County (Bill and Sandy Podulka)
Neighbors of the Onondaga Nation (Jack Ramsden)
New York Residents Against Drilling (Kevin Miller)
Northeast Organic Farming Association of New York (Lia Kene)
NYH2O (Joe Levine)
Otisco Lake Preservation Association (Arla Williams)
Otsego County Conservation Association (Martha Clavette)
Otsego 2000 (Nicole Dillingham, J.D.)
Park Slope Food Coop (Iess Robinson)
People for a Healthy Environment, Inc. (Frank Patterson)
Residents Opposing Unsafe Shale Gas Extraction (Bill Podulka)
Sierra Club Atlantic Chapter (Rachel Treibshier, J.D.)
Skaneateles Lake Association (Mary Menapace)
Sullivan Alliance for Sustainable Development (Dick Biesling)
Sullivan Area Citizens for Responsible Energy Development (Karen London, J.D.)
Sustainable Otsego (Ron Bishop, Ph.D., CHD)
The Boda Kill Area Association, Inc. (Paula Medley)
The Committee to Preserve the Finger Lakes (Melanie Steinberg)
The Finger Lakes Group of the Atlantic Chapter of the Sierra Club (Kate Bartholomew)
Tioga Peace and Justice (Cecile Lawrence, J.D., Ph.D.)
United for Action (Owen Crowley)

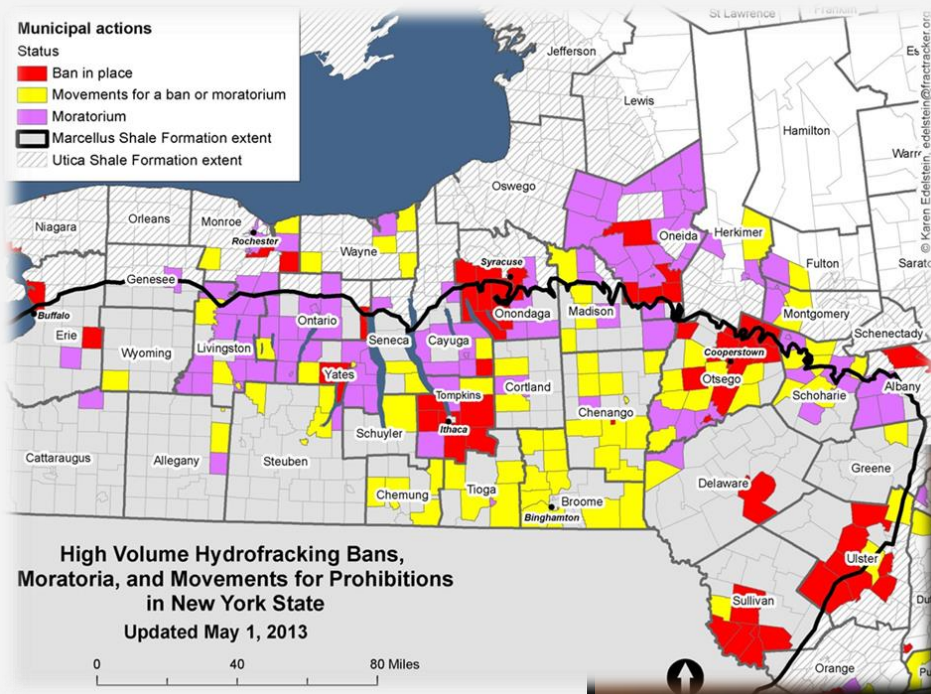
- **GASLAND** mobilized citizens and communities



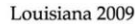
■ HOME RULE

...dozens of communities across New York passed moratoriums and bans on fracking, and in June, (2014) the state's highest court, the Court of Appeals, ruled that towns could use zoning ordinances to ban fracking.

<http://www.nytimes.com/2014/07/01/nyregion/towns-may-ban-fracking-new-york-state-high-court-rules>



- 



New York Regulations



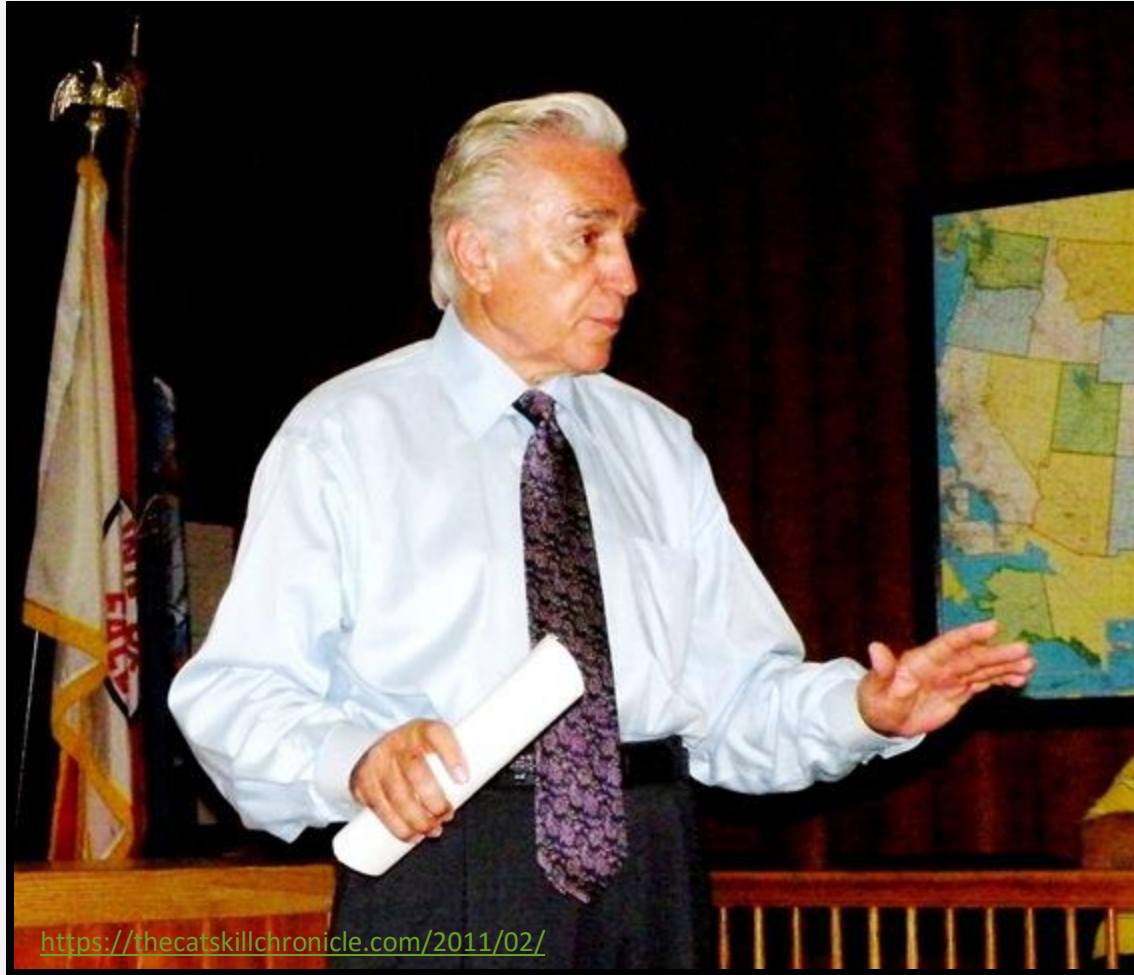
...and with a little help from our friends...



<http://www.commondreams.org/news/2013/01/09/pete-seeger-joins-protesters-say-dont-frack-new-york>

- **Congressman Hinchey sponsored the FRAC Act and secured funds for the EPA to study the impacts of HF on water**

<https://www.propublica.org/article/congress-tells-epa-to-study-hydraulic-fracturing-hinchey-1110>



- Health professionals wrote letters to NY's Health Commissioner and Governor, joined by health and environmental orgs, and maintained a presence in Albany to educate policymakers



Since Governor Cuomo's inauguration in January 2010, hundreds of health professionals and organizations from across the state of New York have called on his administration to conduct an independent, comprehensive Health Impact Assessment. The letters can be found at <http://concernedhealthny.org/letters-to-governor-cuomo/>

October 14, 2015

May 29, 2014

February 27, 2013

October 4, 2012

March 16, 2012

December 12, 2011

October 5, 2011

March 26, 2011

February 28, 2011

*The Honorable Andrew M. Cuomo
Governor of New York State
NYS State Capitol Building
Albany, NY 12224*

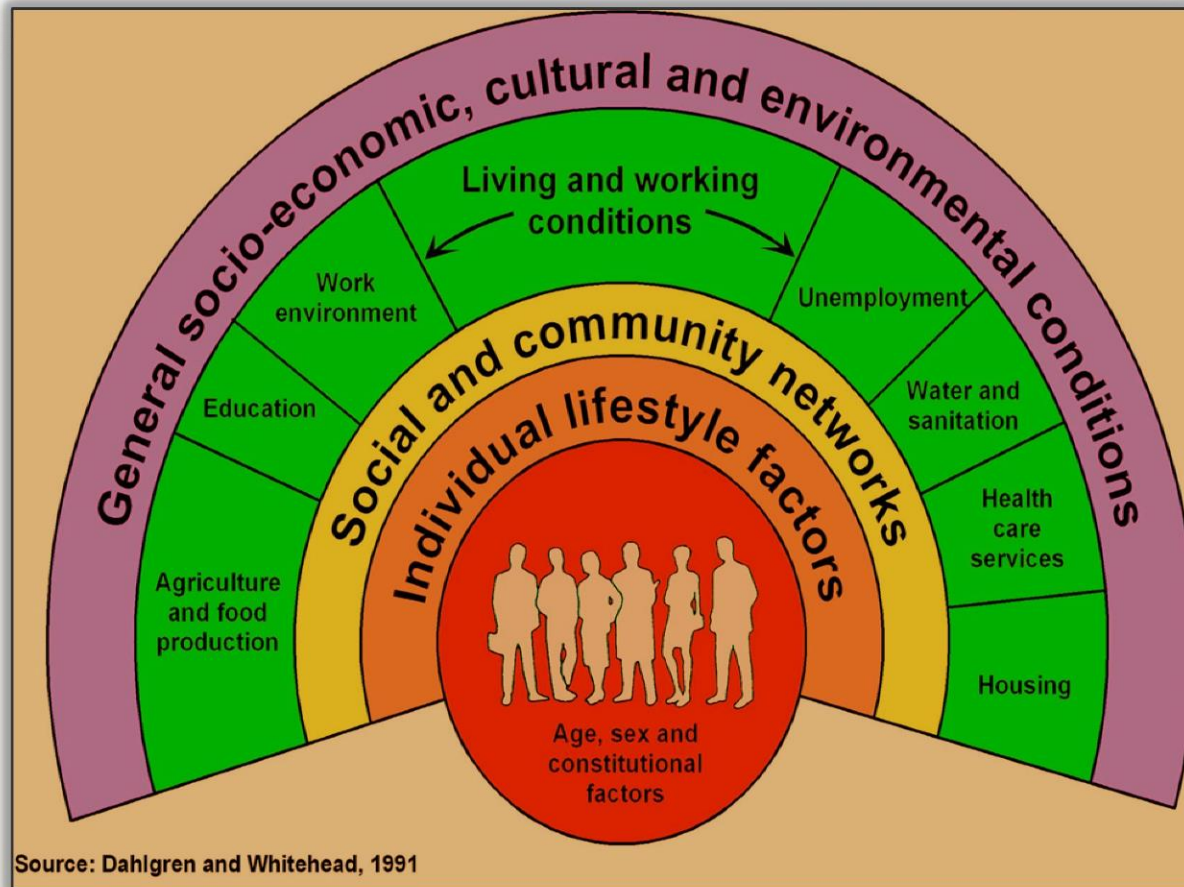
*Health Commissioner Howard A. Zucker
New York State Department of Health
Corning Tower
Empire State Plaza,
Albany, NY 12237*

Dear Governor Cuomo and Health Commissioner Zucker,

ROLE OF PUBLIC HEALTH ADVOCATES — WHEN AN ACTIVITY THAT MAY IMPACT HUMAN HEALTH, SUCH AS GAS DRILLING, IS CONTEMPLATED, OR ALREADY IN A COMMUNITY...ASSESS AND ADVOCATE

- **The U.S. Institute of Medicine has defined the field of public health as "what we do as a society to assure the conditions in which people can be healthy."** See Addressing the Social Determinants of Health Inequities: Learning from Doing. American Journal of Public Health, Vol 95(4) 553-555

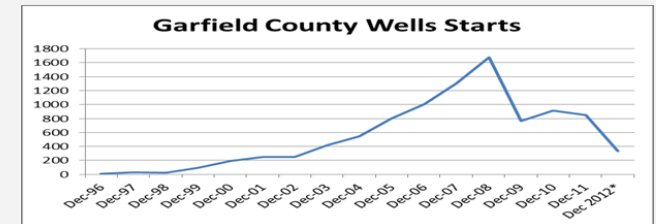
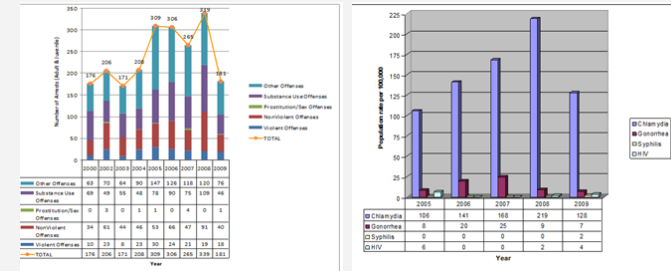
■ DETERMINANTS OF HEALTH



We knew that COMMUNITY IMPACTS may be associated with health effects

- traffic and road safety
- worker safety
- housing, community character, schools
- crime, sexually transmitted infections and substance abuse
- economic issues such as employment, value of home
- health infrastructure including availability, insurance, cost
- justice concerns such as vulnerable populations, equality
- cumulative effects of multiple stressors
- loss of viewshed, foodshed and watershed

<http://www.maneyonline.com/doi/abs/10.1179/2049396713Y.0000000024?token=00501af2d2efc5546541333c4a2f7a3f6a5e2c494147767667774f6d62222c227e37253033297619&> and <http://www.catskillmountainkeeper.org/our-programs/fracking/whats-wrong-with-fracking-2/4513-2/> and <http://www.marcellus.psu.edu/resources/PDFs/ImpactsKelsey.pdf> and <http://www.swarthmore.edu/academics/environmental-studies-capstone/environmental-and-health-concerns/habitat-destruction-and-fragmentation.xml>



Public Health Risks of Shale Gas Development
by John L. Adgate, Bernard Goldstein, and Lisa M. McKenzie

http://sites.nationalacademies.org/xpedit/groups/dbasse/site/documents/webpage/dbasse_083235.pdf



<http://pubs.cas.psu.edu/freepubs/pdfs/ee0020.pdf>

...and ENVIRONMENTAL STRESSORS existed as well

- air pollution
- water contamination
- chemical mix
- radiation
- waste

WHO
MIGHT BE
IMPACTED?

People and communities...

- ~ in areas mining silica
- ~ where gas is extracted, processed and transported
- ~ near pipelines, power plants and storage facilities
- ~ who receive their water from gas drilling areas
- ~ who are downwind of gas producing or processing areas
- ~ whose regions receive gas drilling waste
- ~ Marcellus shale gas consumers
- ~ who are workers in the gas industry
- ~ whose health is already compromised, or who are vulnerable, as well as animals, water , air and crops

There is a process which brings public health to the table and which can inform land use decisions and should be used prior to the development of regulations and before permitting. It is particularly important in the case of gas exploration and production.

HEALTH IMPACT ASSESSMENT

“HIA IS A SYSTEMATIC PROCESS THAT USES AN ARRAY OF DATA SOURCES AND ANALYTIC METHODS AND CONSIDERS INPUT FROM STAKEHOLDERS TO DETERMINE THE POTENTIAL EFFECTS OF A PROPOSED POLICY, PLAN, PROGRAM, OR PROJECT ON THE HEALTH OF A POPULATION AND THE DISTRIBUTION OF THOSE EFFECTS WITHIN THE POPULATION. HIA PROVIDES RECOMMENDATIONS ON MONITORING AND MANAGING THOSE EFFECTS.”

“IMPROVING HEALTH IN THE UNITED STATES: THE ROLE OF HEALTH IMPACT ASSESSMENT”

[HTTP://WWW.NAP.EDU/CATALOG.PHP?RECORD_ID=13229](http://www.nap.edu/catalog.php?record_id=13229)

CHARACTERISTICS OF THE HIA

- It is meant to be prospective, preventive and proactive
- The timing of an HIA is best when it is done before a policy, process or regulation is implemented
- It focuses the attention of decision-makers on the health consequences of projects and policies that they are considering
- It identifies vulnerable groups and stakeholders
- An HIA uses existing data sources such as population data, surveys, risk assessment, literature review, expert opinions and stakeholder input to predict the impact on a population from a particular land use decision by considering direct and indirect health risks and solutions from a cradle-to-grave approach
- It is a decision support tool and not intended to simply evaluate a decision after it is made
- It offers recommendations for further study, and does not necessarily include the studies; it draws from available information in similar conditions when data is incomplete
- It has the potential to save healthcare costs in the long run

THE MAJOR STEPS IN CONDUCTING AN HIA ARE SIMILAR TO THOSE OF AN EIS

- Screening (identify projects or policies for which an HIA would be useful)
- Scoping (identify which health effects to consider)
- Assessing risks and benefits (identify which people may be affected and how they may be affected—baseline and potential impact; identify vulnerable groups)
- Developing recommendations (suggest changes to proposals to promote positive health outcomes and mitigate adverse health effects)
- Reporting (present the results to decision-makers)
- Evaluating (determine the effect of the HIA on the decision)

from <http://www.cdc.gov/healthyplaces/hia.htm>

REASONS AN HIA IS USEFUL IN LAND USE DECISIONS

- The practice of Health Impact Assessment (HIA) elevates the role of health in decision-making
- HIAs are a practical tool that can provide a structured process to determine a policy or project's impact on health
- HIAs bring both immediate and long term health benefits
- HIAs ensure project dollars are used efficiently to provide the highest benefit to communities
- They help create healthier communities by addressing the root causes of many significant health problems
- HIAs have demonstrated success in a variety of issue areas, ranging from land use and transportation to housing policies, labor standards, natural resource extraction, education and economic policies

HIA IS A HELPFUL TOOL FOR THE MEDICAL COMMUNITY

- **Advocacy and leadership**
- **HIA is unique in that health is brought into decisions and policies which may not have previously considered health implications**
- **Involves coordination, cooperation and communication among stakeholders, policymakers and health professionals**
- **Integrates best research with clinical expertise in order to make informed decisions about the health of a community**
- **HIA includes developing recommendations to minimize adverse health effects**
- **Influences patient care because the practitioner will be more aware of a particular land use, and its potential health impacts**
- **Understanding how HIAs work and how they can inform a decision integrates medical knowledge with environmental policies**

**The process of HIA been used less than a handful of times in the US
to inform proposed gas drilling regulations or policy—
in Battlement Mesa CO,
North Slope AK,
by the Univ of Maryland for the State of Maryland,
by the Univ of Michigan for the State of Michigan**

ment

Deputy Commissioner, NYS Department of Environmental Conservation
Nirav R. Shah, Commissioner, NYS Department of Health
Howard A. Freed, Director of the DOH Center for Environmental Health
State Majority Leader Dean Skelos
Assembly Speaker Sheldon Silver
Assembly Member Greg Ball
Assemblyman Robert Sweeney
Assemblyman Richard Gottfried

On behalf of the undersigned organizations and health professionals, we are writing with regard to the revised draft of the Supplemental Generic Environmental Impact Statement (SGEIS) on the Oil, Gas, and Solution Mining Program issued in full in September 2011. We are greatly concerned about the omission of a critical issue related to the development of natural gas using high-volume hydraulic fracturing or "fracking": human health impacts.

Specifically, we request that the draft SGEIS be supplemented to include a full assessment of the public health impacts of gas exploration and production. This should include analysis of the existing documentation of the baseline health status of the New York State population; systematic identification and analysis of direct and indirect health effects; a cumulative health impacts analysis that includes a reasonable "worst case" assessment; and any potential measures to eliminate these impacts.

Specifically, we request that the draft SGEIS be supplemented to include a full assessment of the public health impacts of gas exploration and production. This should include analysis of the existing documentation of the baseline health status of the New York State population; systematic identification and analysis of direct and indirect health effects; a cumulative health impacts analysis that includes a reasonable "worst case" assessment; and any potential measures to eliminate these impacts.

Notably, a comprehensive assessment of health impacts is likely to include information—such as mounting costs for health care and air and water pollution mitigation—that could inform how DEC and other agencies such as the Department of Health (DOH), evaluate and assess cumulative impacts and how DEC reviews any proposed gas development permit applications. A comprehensive Health Impact Assessment (HIA) would be the most appropriate mechanism for this work, conducted by an independent entity such as a school of public health. This request is based in part on the fact that the New York DOH is unwilling to perform this function. Please refer to attached communication from Dr. Howard A. Freed, director of the DOH Center for Environmental Health, stating that "another methodology such as Health Impact Assessment would not provide significant additional information that is not already being covered" in the SGEIS. The undersigned disagree with this conclusion because the SGEIS does not, in fact, consider impacts.

Alan Abramson, MD

Organization

[illegible]

Support for a Health Impact Assessment in NYS budget

March 16, 2012

The Honorable Andrew M. Cuomo
Senate Majority Leader Dean Skelos
Assembly Speaker Sheldon Silver

Dear Governor Cuomo, Senate Majority Leader Skelos, and Speaker Silver,

As you negotiate the budget, we urge you to include a Health Impact Assessment on gas exploration and production using high-volume, slick water, horizontal hydraulic fracturing in the New York State 2012-2013 budget. The New York State Assembly included such a health impact assessment in their 2012-2013 budget resolution.

The medical community across New York has become increasingly concerned about the health impacts of hydraulic fracturing. Throughout the country health impacts ranging from loss of smell, memory problems, and headaches to a number of serious respiratory illnesses and cancers have been associated with high-volume, slick water, horizontal hydraulic fracturing. In October 2011, 250 physicians and medical professionals joined together in calling for a comprehensive public health impact assessment <http://www.psehealthyenergy.org/resources/view/198813>. On December 10, 2011 Dr. Sandra Steingraber, Lois Gibbs and Fran Drescher echoed that call with nineteen NY-based cancer advocacy groups in a letter asking for the same assessment <http://www.psehealthyenergy.org/resources/view/198831>.

Experts in the federal government are also asking that more research be done on the health impacts of fracking, including Christopher Portier, the Director of the National Center for Environmental Health at the Centers for Disease Control and Prevention in Atlanta, Georgia. As one of the most respected researchers on health issues, Portier stated, "More research is needed for us to understand public health impacts from natural gas drilling and new gas drilling technologies." To go forward in New York without a proper health impact assessment is therefore unacceptable. We respectfully request that an appropriation be made for this study.

Sincerely,

Robert F. Kennedy, Jr.
Elie Ward, American Academy of Pediatrics District II, NYS
Broome County Medical Society
Medical Society of the County of Tompkins
Familycare Medical Group, Syracuse, NY
Ramon Murphy MD
Lila Kalinich MD
Judith Maidenbaum PhD
Eric London MD
David Gould MD, MBA
Kenneth Jaffe, MD
Kathleen Nolan MD, MSL
Maya Shetreat-Klein MD
Michelle Bamberger PhD
Donna Flayhan PhD
James Dalton MD
Janet Corson-Rikert MD
Beth Olearczyk MD
Richard Weiskopf, MD

Sandra Steingraber PhD
MaryBeth Carlberg MD
John Cooke MD
James C. Macmillan MD
Suzanne Anderson MD
Rhonda Peterson MD
William Klepack MD
Dr Christine Durbak
D. Barry Crittenden, MD
Amy Freeth MD
Adam Law MD
Jeff Snedeker MD
Connie A. Jastremski RN MS MBA
FCCM
Michael Jastremski MD
Larysa Dyrszka MD
Paul Bermanzohn, MD
Brent White, MD

MEDICAL SOCIETY OF THE STATE OF NEW YORK

99 WASHINGTON AVENUE, SUITE408, ALBANY, NY 12210
518-465-8085 • Fax: 518-465-0976 • E-mail: albany@mssny.org



Medical Society of the State of New York

High Volume Hydraulic Fracturing

New York State physicians have expressed concern about potential short term and long term health consequences of hydraulic fracturing. MSSNY's Preventive Medicine and Family Health Committee (PMFHC) was charged with studying the subject and forming MSSNY policy on hydraulic fracturing.

The MSSNY Council adopted a policy on December 9, 2010 (Position Statement # 90.992) to "support a moratorium on natural gas extraction using high volume hydraulic fracturing in New York State until valid scientific information is available to evaluate the process for its potential effects on human health and the environment.

Following the publication of the *Draft Supplemental Generic Environmental Impact Statement (draft SGEIS)* by the Department of Environmental Conservation (DEC) in September 2011, MSSNY responded to the request for comments on November 22, 2011. This letter reiterated MSSNY's concerns about human health consequences and the impact on the environment. In addition, MSSNY recommended ongoing monitoring and analysis, including a Health Impact Assessment which should be conducted by the New York State Department of Health or a different, non-governmental, health organization.

Hydraulic fracturing Health Impacts Assessment

The New York State Nurses Association (NYSNA), representing the interests of registered nurses and the patients they serve, strongly supports the requirement of a Health Impacts Assessment on gas exploration and production using high-volume, horizontal hydraulic fracturing, prior to the issuing of any drilling permits in New York State. The Assembly budget proposal has set aside \$100,000 for a study by a school of public health within the state university system to accomplish the assessment.

The study would include research into other states' experiences with hydraulic fracturing; estimated costs of any health impacts to the state, local governments, insurers, employers and the healthcare system; and a long-term plan for monitoring and mitigating health impacts. The purpose of this study is to inform New Yorker's of any and all potential public health impacts posed by hydraulic fracturing and to provide an analysis of those impacts. Analysis and information from this study will then be used to help facilitate informed decisions regarding actions to be taken with respect to such activities in the state.

The expansion of hydraulic fracturing is irresponsible until more research is done to ensure the safety of the water supply and the quality of the air in New York. Other states, including Pennsylvania and Wyoming, have found that hydraulic fracturing has contaminated groundwater with synthetic chemicals, some of which are known to cause genetic abnormalities and stillbirths. In a study conducted by the Environmental Protection Agency, chemicals associated with gas production and hydraulic fracturing fluids were found inside deep water wells in Wyoming (Dilouhy, 2011). Regulators in Pennsylvania also determined that gas drilling led to contaminated water and found an increased incidence of heavy metals toxicity among farm animals. (Griswald, 2011).

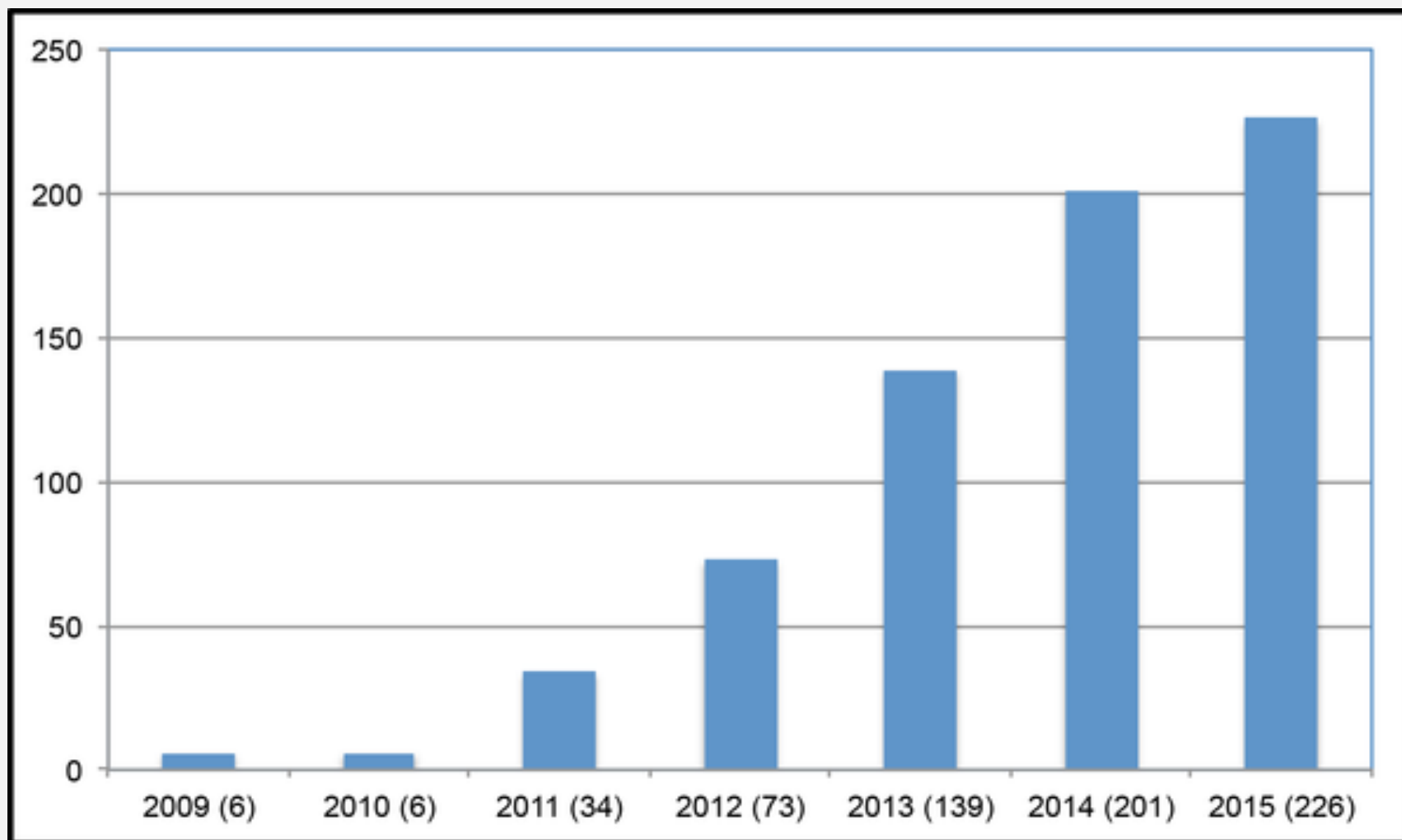
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- Concerned Health Professionals of New York released Compendia of health effects of fracking



Number of publications that assess the impacts of UNGD per year, 2009–2015



Hays J, Shonkoff SBC (2016) Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015. PLoS ONE 11(4): e0154164.

doi:10.1371/journal.pone.0154164

<http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0154164>

FRACKING COMPENDIUM UPDATE

Dozens of new studies

**“clarify, corroborate, and further
explicate intractable problems”**



**December 11, 2014:
Health professionals
release major update to the
*Compendium of Scientific,
Medical, and Media Findings
Demonstrating Risks and
Harms of Fracking***





**COMPENDIUM OF SCIENTIFIC, MEDICAL, AND MEDIA FINDINGS
DEMONSTRATING RISKS AND HARMS OF FRACKING
(UNCONVENTIONAL GAS AND OIL EXTRACTION)**

Third Edition

October 14, 2015



A Public Health Review of

High Volume Hydraulic Fracturing for Shale Gas Development

December 2014

Dr Zucker's review boiled down to a simple question: Would he want his family to live in a community where fracking was taking place?

His answer was no.

It "would be reckless to proceed [with HVHF] in New York until more authoritative research is done."

"We cannot afford to make a mistake," he said. "The potential risks are too great."

http://www.nytimes.com/2014/12/18/nyregion/cuomo-to-ban-fracking-in-new-york-state-citing-health-risks.html?_r=0





- 
- **focus in NY now on gas infrastructure;**
 - **potential impacts and health concerns are similar to those from fracking, and the environmental stressors include:**

**CHEMICAL EXPOSURE /
RADIOACTIVITY /
WATER WITHDRAWAL, CONTAMINATION /
GAS STORAGE / WASTE DISPOSAL /
PROCESSING AND FOSSIL FUEL PLANTS /
AIR EMISSIONS/
PIPELINES AND COMPRESSORS / OIL TRAINS / EXPORT TERMINALS
CLIMATE CHANGE**



MEDICAL SOCIETY OF THE STATE OF NEW YORK

May 2, 2015 – The Medical Society of the State of New York adopted a resolution, “Protecting Public Health from Natural Gas Infrastructure,” that recognizes the potential impact to human health and the environment of natural gas pipelines and calls for a governmental assessment of these risks.



AMERICAN MEDICAL ASSOCIATION

June 9, 2015 -- The American Medical Association (AMA) adopted a resolution, “Protecting Public Health from Natural Gas Infrastructure,” that states, “Our AMA recognizes the potential impact on human health associated with natural gas infrastructure and supports legislation that would require a comprehensive Health Impact Assessment regarding the health risks that may be associated with natural gas pipelines.”

CLIMATE CHANGE

- Natural gas is methane, a greenhouse gas that is 86X more potent than carbon dioxide over a twenty year period. “The footprint for shale gas is greater than that for conventional gas or oil when viewed on any time horizon, but particularly so over 20 years.” 2011 Howarth, Santoro and Ingraffea.
- Natural gas systems are the single largest source of anthropogenic methane emissions in the U.S., representing almost 40% of total emissions. EPA 2011 data.
- Global climate change costs significant healthcare dollars 2009 Sheffield and Landrigan.
- The threats to health posed by climate change are multiple, and increasingly severe. 2014 PSR
- Threats posed by climate change include air pollution, waterborne diseases, vector-borne diseases, agricultural losses, heat waves, extreme weather events and rising sea levels, and the impacts of a combination of these threats. 2014 PSR



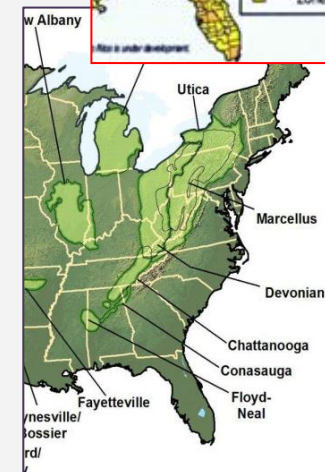
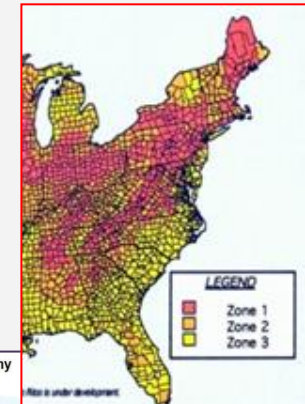
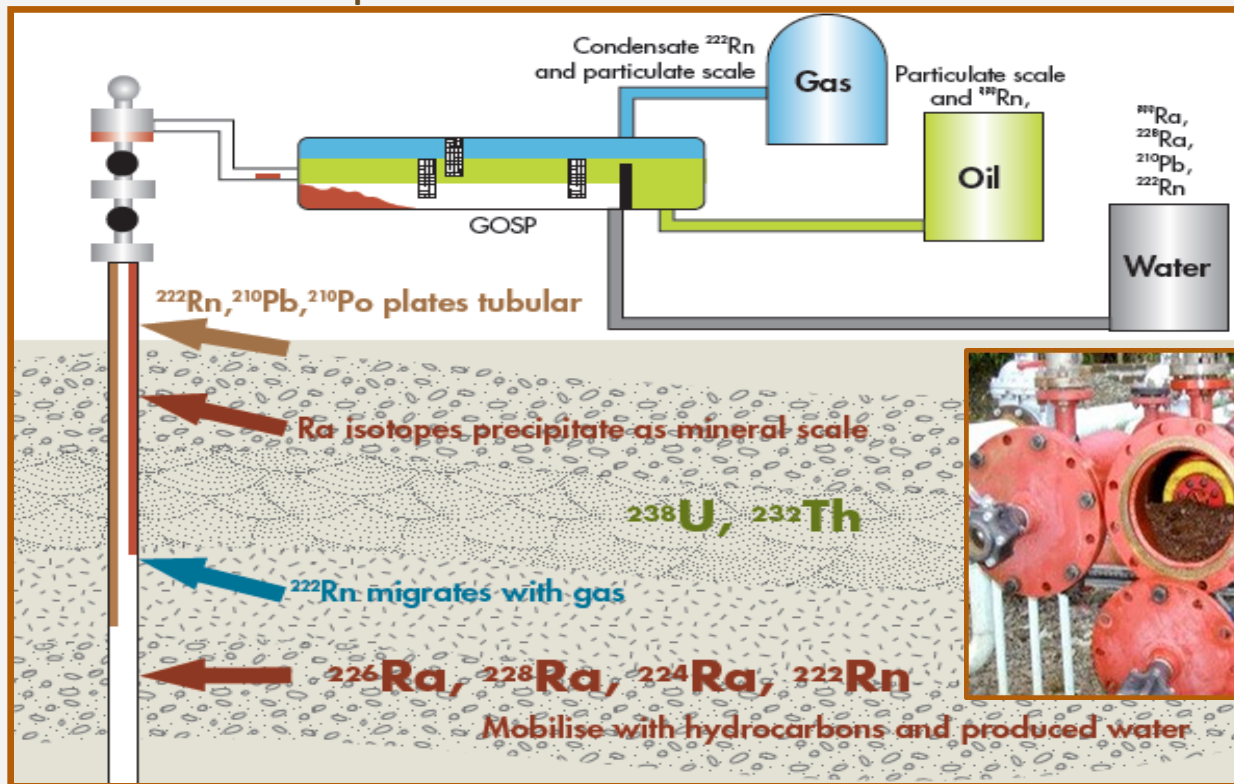
RADIOACTIVITY

- The radioactive elements found in Marcellus shales include uranium, thorium, radium, polonium and radon.
- Federal exemption for radioactive waste exists.
- Radon travels with methane through the pipelines.
- Radium and radon levels from the Marcellus shale are significantly elevated.
- Radionuclides, the decay products of radon, such as Lead-210 and Polonium-210 can be found in pipeline scrapings as well as sludge accumulating in tank bottoms, gas/oil separators, dehydration vessels, compressor facilities, liquid natural gas (LNG) storage tanks and in waste pits.



PIGS

Pipeline Inspection or Intervention
Gauge/Gizmo/Gadget



CHEMICAL MIX

~IS CONSIDERED PROPRIETARY

~INCLUDES KNOWN OR SUSPECTED CARCINOGENS, MUTAGENS, ENDOCRINE DISRUPTORS, NEUROTOXINS, HAZARDOUS AIR POLLUTANTS
~MANY OF THE CHEMICALS IN THESE PRODUCTS HAVE EFFECTS AT LOW DOSES, AND CHILDREN AND PREGNANT WOMEN SHOULD NOT BE EXPOSED TO SOME AT ALL.

- Dr Theo Colborn first described the chemicals associated with gas drilling operations; many are endocrine disruptors
- A University of Missouri School of Medicine study linked fracking with dangerous hormone-disrupting chemicals in the water near gas drilling sites, including the Colorado River
- In this recent study of a large cohort, an association was observed between density and proximity of natural gas wells within a 10-mile radius of maternal residence and prevalence of congenital heart defects and possibly neural tube defects.
- Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations are described

Some of the chemicals used in gas drilling and hydraulic fracturing that are toxic to human health:

- Benzene (known carcinogen)
- Toluene (causes miscarriages, placenta previa)
- Diesel (recently classified by WHO as a carcinogen)
- Naphthalene (neurotoxin; carcinogen)
- Polynuclear aromatic hydrocarbons (PAHS) (carcinogens)
- Formaldehyde (known carcinogen)
- 2-Butoxyethanol (2BE)



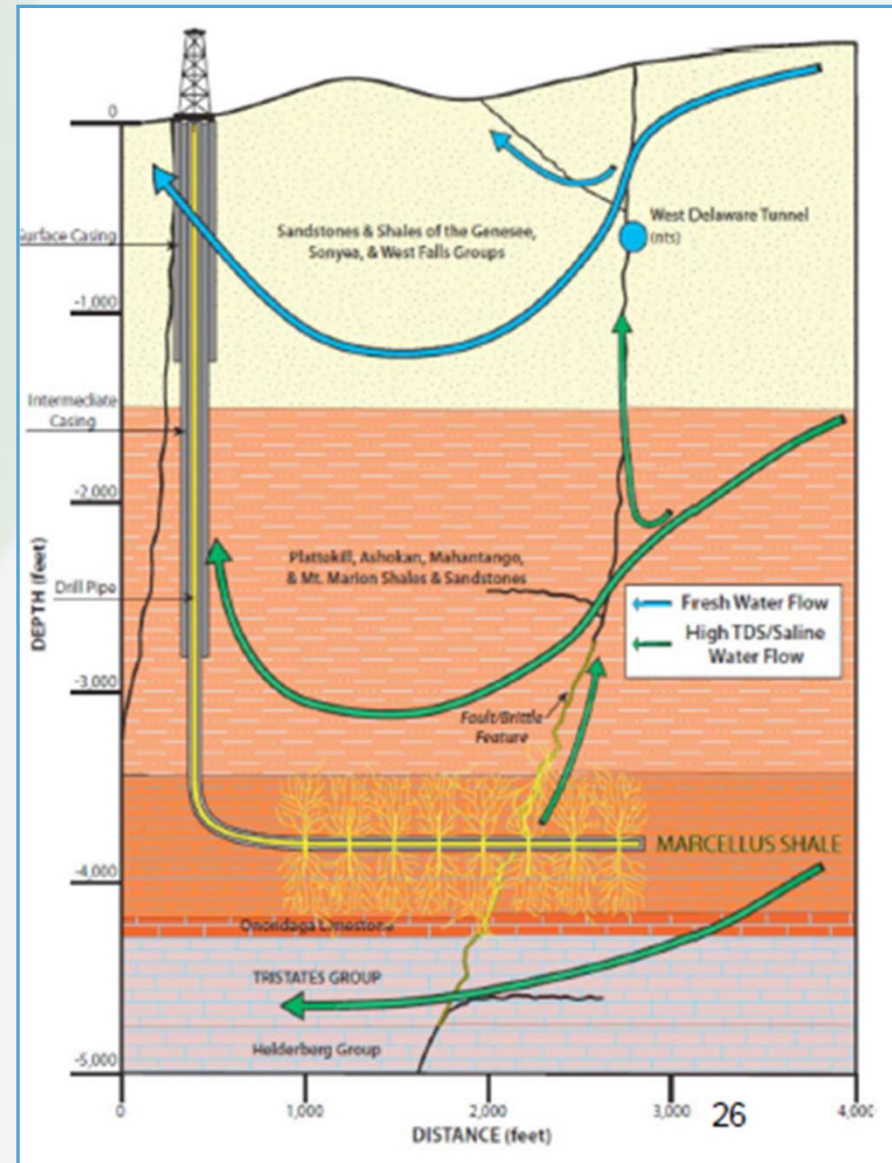
<http://endocrinedisruption.org/assets/media/documents/cP02591Colborn20021022coalbedmethane2-BEcomments.pdf> and <http://www.atsdr.cdc.gov/ToxProfiles/tp118-c2.pdf> and <http://www.degruyter.com/view/j/reveh.2014.29.issue-4/reveh-2014-0057/reveh-2014-0057.xml>

WATER



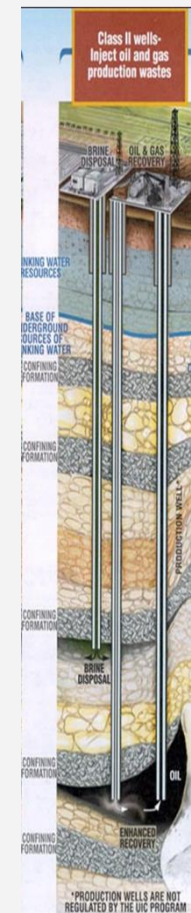
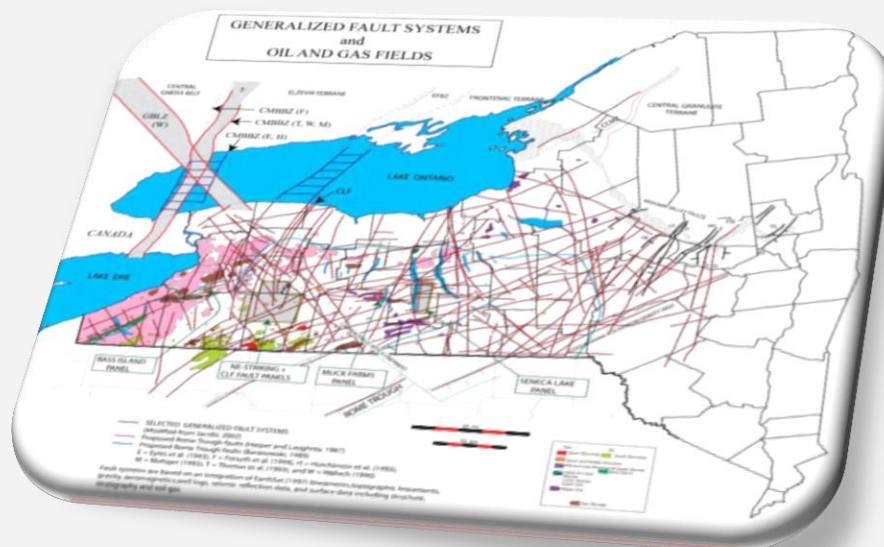
Oil and gas activities contaminate surface and ground water from

- spills
- injection
- storage
- well casing failure



WASTE DISPOSAL

- waste from fracking is extremely high in TDS and barium
- hazardous with current disposal methods
- waste contains radioactive elements, brine and gases
- exempt from federal oversight
- disposal in underground injection wells can, and has caused earthquakes.



COMMUNITY IMPACTS

- air and water impacts
- community tension
- traffic and road safety problems
- abandonment by officials
- crime, sexually transmitted infections and substance abuse
- housing, community character, schools
- economic issues such as value of homes
- cumulative effects of multiple stressors
- worker safety
- noise
- loss of viewshed, foodshed and watershed
- “Solastalgia”



IMPACTS OF TOXINS ON CHILDREN



Children are especially vulnerable to air pollutants because their lungs are developing and growing, they breathe at a higher rate than adults, and they spend more time playing outdoors, often being very physically active. Childhood exposure to ozone and particulate matter causes well-documented health effects. Ozone exposure may lead to a number of adverse health effects in children, such as shortness of breath, chest pain when inhaling deeply, wheezing and coughing, temporary decreases in lung function, and lower respiratory tract infections.

Childhood exposure to particulate matter has been associated with respiratory symptoms, decreased lung function, exacerbation of asthma, and development of chronic bronchitis. Rates of preterm births, low birth weight, and infant mortality are increased in communities with high particulate levels. Exposure to particulate matter is also associated with increased school absences, emergency room visits and hospital admissions.

Potential hazards of air pollutant emissions from unconventional oil and natural gas operations on the respiratory health of children and infants by Ellen Webb, Jake Hays, Larysa Dyrszka, Brian Rodriguez, Caroline Cox, Katie Huffling and Sheila Bushkin-Bedient, Published Online: May 12, 2016, Reviews on Environmental Health

<http://www.degruyter.com/view/j/reveh.ahead-of-print/reveh-2014-0070/reveh-2014-0070.xml>

<HTTP://YOSEMITE.EPA.GOV/OCHP/OCHPWEB.NSF/CONTENT/CLIMATE.HTM>

AIR POLLUTANTS

- Methane (CH_4)
- BTEX - Benzene, toluene, ethylbenzene, and xylene
- Nitrogen oxide
- Sulfur Dioxide
- Formaldehyde
- Particulate matter
- Carbon monoxide
- VOCs
- Radon, polonium and lead



SOURCES

- Emissions and waste from transport vehicles, combustion at compressor stations, storage and condensate tanks, metering stations, processing plants, pipelines
- Flaring, venting, blowdowns and leaks

- Compressor Engines
- Compressor Blowdowns
- Condensate Tanks
- Storage Tanks
- Truck Loading Racks
- Glycol Dehydration Units
- Amine Units
- Separators
- Fugitive Emission Sources
- 90% of individuals reported experiencing odor events from these facilities

**UNITS AT
COMPRESSORS
RELEASING
EMISSIONS**
Subra Earthworks

COMMON COMPLAINTS NEAR COMPRESSORS



Air emissions as seen with infrared camera

Most common COMPLAINTS of residents living near compressors:

- Skin rash or irritation
- Eye irritation
- Gastrointestinal problems such as pain, nausea, vomiting
- Respiratory problems such as difficulty breathing or cough
- Upper respiratory problems such as congestion, sore throat and nosebleeds
- Neurological problems such as headaches, movement disorders, dizziness
- Psychological problems such as anxiety, depression, stress, irritability

Possible long-term consequences:

- Cardiovascular such as heart attack and high blood pressure
- Respiratory such as exacerbation of asthma, COPD
- Neurological such as stroke and cognitive deficits in children
- Birth defects
- Cancer
- Premature mortality

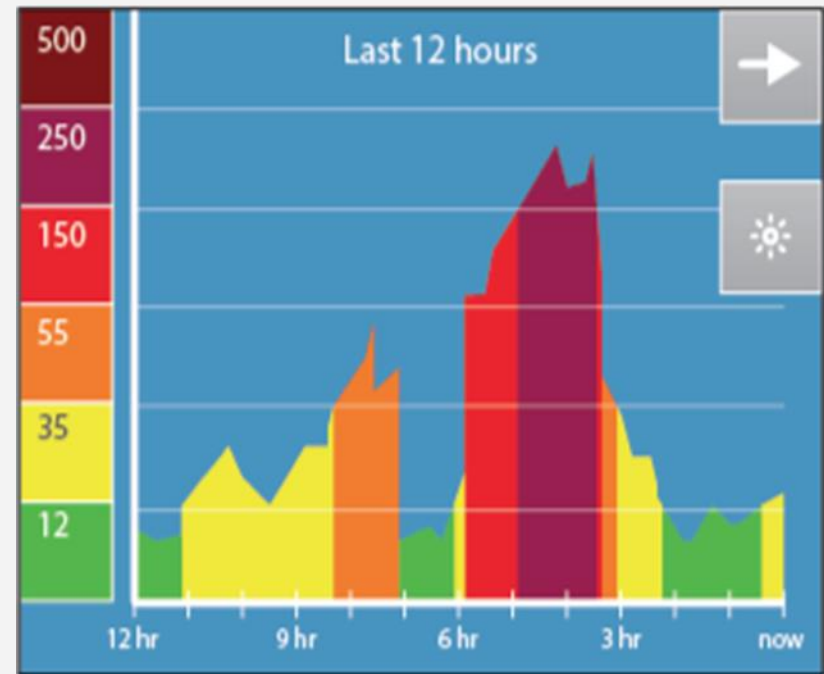


REVIEW OF REPORTED SYMPTOMS

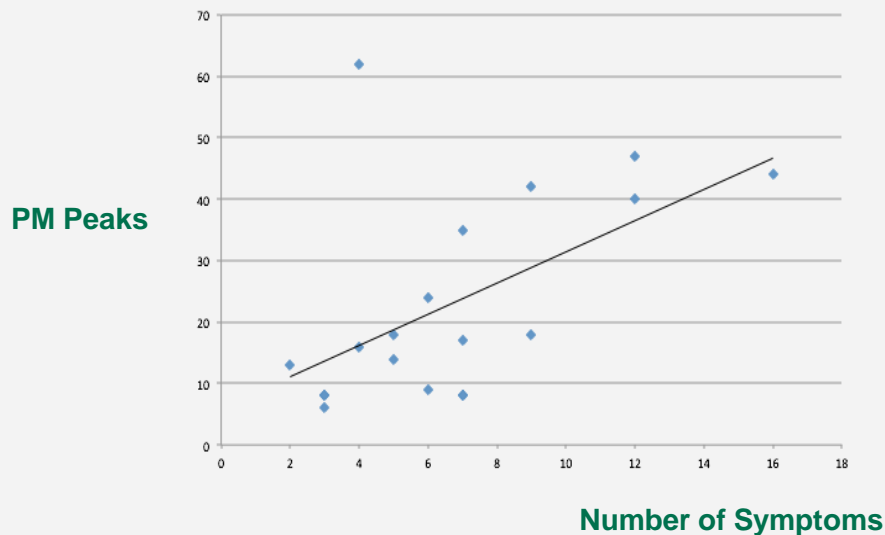
AT SWPA-EHP, THE CLINICIANS WERE OBSERVING SYMPTOMS IN PEOPLE LIVING NEAR GAS DEVELOPMENT, AND THOSE SYMPTOMS COULD BE PERSISTENT, TRANSIENT, OR INTERMITTENT. THESE VARIATIONS IN SYMPTOM PRESENTATION ARE CONSISTENT WITH THE CHANGING AND EPISODIC NATURE OF EXPOSURES.

THE GRAPH IS A SCREEN SHOT OF A SPECK PARTICULATE MATTER MONITOR 12-HOUR REPORT. ONE WOULD EXPECT THAT SYMPTOM SEVERITY CORRELATED WITH THE HEIGHT OF THE PM MEASUREMENT.

AND IT DID...



PM 2.5 Peaks vs. Number of symptoms (N=17)



MINISINK: PILOT PROJECT

SUMMARY OF AIR MONITORING AND HEALTH ASSESSMENT AT 8 RESIDENCES

DATA COMPILED BY CELIA LEWIS PHD

- Community coordinator
- Health assessments of 8 families
- PM_{2.5} monitoring with Speck monitors
- VOC sampling with summa canisters

The predominant health impacts reported were:

- Respiratory problems
- Neurological problems
- Dermatological problems
- Overall “quality of life” levels were below normal for half of the respondents when compared to a national standard (SF36).

<http://www.environmentalhealthproject.org/researchers/resources>

EPISODIC HIGH LEVELS OF PM_{2.5} OUTSIDE MULTIPLE HOMES OCCURRED WITHIN SIMILAR TIME FRAMES SEVEN TIMES OVER 59 DAYS.

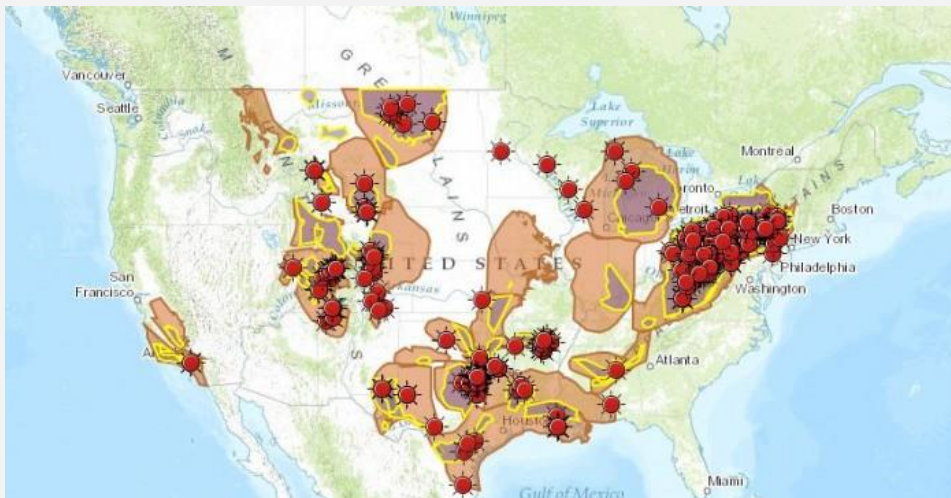
**RESULTS ARE BASED ON
HOURLY AVERAGES OF UG/M³ VALUES.**

Date of Peak event	# of monitors showing a peak out of # in use	Recorded peak levels	Daily <u>AQI</u> average
10/30	3/4	31, 90, 426	5.0
11/5	2/5	33, 57	5.5
11/7	3/5	36.5, 114, 133	5.3
11/12	4/5	53.7, 131, 269, 325	9.0
12/3	3/5	40, 235, 399	5.0
12/6	2/5	76, 160	10.8
12/17	3/5	99, 162, 229	9.9

There is no public health agency in the United States that is routinely seeking and compiling information about people who have been adversely impacted by shale gas development...not on the local, county, state, or federal level.

Instead...

- Most of the literature on health impacts has been published in the last 3-4 years, and usually not in the mainstream general medical literature, and the results have not been included in the regulatory process
- Federal exemptions limit information at the national level
- Doctors are not adequately trained to recognize, nor do they have time to investigate, environmental exposures
- non-disclosure agreements are common, and prevent important information-sharing



<http://www.fracktracker.org/2013/03/pacwas-list-of-the-harmed-now-mapped-by-fracktracker/>



<http://climate-connections.org/2013/08/02/range-resources-attorney-seeks-gag-order-on-7-and-10-year-old-in-pittsburgh-area-shale-gas-case/>

CITIZEN SCIENCE



<http://scistarter.com/blog/2014/11/fracking-air-quality-study-power-citizen-science/#sthash.S1ZH7R6U.dpbs>

ATSDR

The Agency for Toxic Substances and Disease Registry is a federal agency which is tasked with “taking responsive public health actions and providing trusted health information to prevent harmful exposures and diseases related to toxic substances.” The Agency’s Public Health Assessment has empowered communities with health and community interventions and changes to State and Federal policies.

Any citizen can submit a Petition for a Public Health Assessment to ATSDR.

<http://www.atsdr.cdc.gov/>

- **Damascus Citizens for Sustainability Natural Gas Exploration and Production** survey of environmental and health impacts is a tool to get help for impacted people. It can be found at <http://www.damascuscitizensatsdr.org/>
- The **Agency for Toxic Substances and Disease Registry** will receive information about impacts, as well as a **petition for a Public Health Assessment**, from households in a survey impact area.
- **Dimock, PA**
- **ATSDR Health Consultation for PM2.5 at Central Station in Brooklyn Township Susquehanna County, PA, and at the Brighich Compressor in Chartiers Township, Washington County, PA**
- ATSDR’s mission requires them to consider your petition.

October 14, 2015

Dear Governor Cuomo and Health Commissioner Zucker,

We, the undersigned health experts and scientists representing Physicians for Social Responsibility nationally and in New York, and Concerned Health Professionals of New York, write to share the third edition of our major compilation and analysis of scientific and health findings related to the impacts of unconventional oil and gas development, particularly high volume hydraulic fracturing (HVHF or “fracking”). In considering the scientific evidence leading up to and following New York’s ban on HVHF, we applaud you for your leadership in relying on solid scientific and medical research and protecting the public health and safety of New Yorkers.

While New York has protected public health and safety from the hazards of HVHF, there is an influx of numerous proposals to expand gas infrastructure. On this topic, for the first time, this edition of our report also compiles and concisely summarizes the evidence pertaining to the impacts of natural gas infrastructure, including transmission pipelines and compressor stations. Considering this new information, we urge New York to use its power in the permitting process to put on hold and deny permits to expand gas infrastructure while assessments of public health and environmental impacts can be undertaken.

We bring your attention primarily to two of our conclusions. First, the new report, *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking, Third Edition*, shows that New York State was right in concluding that “[e]ven with the implementation of an extensive suite of mitigation measures considered...the significant adverse public health and environmental impacts from allowing high-volume hydraulic fracturing to proceed under any scenario cannot be adequately avoided....” (NYS DEC Findings Statement, p. 5). More than 100 new peer-reviewed studies on the impacts of drilling and fracking have been published since New York’s high volume fracking ban was announced in December 2014. Overwhelmingly, these studies find significant risks and adverse impacts, as do the more than 400 studies that we had reviewed in the previous edition of the *Compendium*. These research results are compelling, and we are therefore urging the governors of other states to follow your lead.

Second, the evidence compiled in our report makes clear that New Yorkers are at risk from gas infrastructure projects. As with hydrofracking, the evidence available to date confirms that New York’s DOH and DEC were right to note the potential for harmful air impacts, environmental impacts, and other risks from infrastructure. (DOH Health Review p. 5 and Findings Statement p. 27) Compressor stations and pipelines are both major sources of air pollutants, including benzene and formaldehyde, that create serious health risks for those living nearby while offering little or no offsetting economic benefits. Compressor stations – used along regular intervals of most pipelines – in particular, are semi-permanent facilities that pollute the air 24 hours a day and expose nearby residents to levels of noise pollution known to induce negative health effects. Moreover, emerging data show that their day-to-day air emissions are highly episodic and create periods of potentially extreme exposures.

.....

COMPREHENSIVE SOURCES OF HEALTH INFORMATION



- PSE for Healthy Energy PSE STUDY CITATION DATABASE on Shale Gas & Tight Oil Development <http://www.psehealthyenergy.org/site/view/1180#sthash.CHp8vErJ.dpuf>
- Concerned Health Professionals of NY Compendium <http://concernedhealthny.org/compendium/>
- Southwest Pennsylvania Environmental Health Project www.environmentalhealthproject.org
724.260.5504 info@environmentalhealthproject.org
- Physicians for Social Responsibility www.psr.org
- Fracktracker Alliance www.fracktracker.org



Source: <http://passaicnews.wordpress.com>

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