[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Tuesday, February 3, 2015 7:01 PM
To: Lemuel Srolovic
Subject: follow up

Lem,
Since we spoke I have been in touch with folks who probably know more about company X's past efforts to obfuscate than just about anyone. They have a trove of material to share that speaks to many of the issues touched upon today.

Can you see what days and time might work for us to get together next week with these folks and their material? I'm hoping Steve G can join us. I know Tue doesn't work, but other dates, depending on time, are possible. Thanks.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Friday, February 6, 2015 12:34 PM
To: Lemuel Srolovic
Subject: FW: follow up
Attachments: 64D1D2E8-811D-40B8-85E0-93FF7C3B8280[115].png

Hi, Lem,
Just want to ge this back on the top of your email.
Hope we can make this happen. I think you'll find the material of great use.

Thanks.
Lee

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

From: Lee Wasserman <lwasserman@rffund.org>
Date: Tuesday, February 3, 2015 at 7:00 PM
To: "lemuel.Srolovic@ag.ny.gov" <lemuel.Srolovic@ag.ny.gov>
Subject: follow up

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Lee Wasserman
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475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

From: Larry Shapiro <lshapiro@rffund.org>
Sent: Sunday, February 8, 2015 1:21 PM
To: Lemuel Srolovic; Steven Glassman
Cc: Lisa Hamilton (lisa_a_hamilton@yahoo.com)
Subject: Peabody and Prairie State

Good to see you guys last week. I thought this AP story might interest you. http://abcnews.go.com/US/wireStory/illinois-power-plant-center-midwest-rate-fights-28814053

Larry Shapiro
Associate Director for Program Development
Rockefeller Family Fund
475 Riverside Drive, Suite 900
New York, NY 10115
[redacted]
Email: lshapiro@rffund.org

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 11, 2015 10:42 AM
To: 'Lee Wasserman'
Subject: RE: follow up

Lee – last week was crazy and this week front-loaded but this Friday afternoon, 2/13, is clear, as is Thursday and Friday afternoon of next week 2-19-20). Would any of those work? Regards, Lem

---

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Friday, February 06, 2015 12:34 PM
To: Lemuel Srolovic
Subject: FW: follow up

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Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 11, 2015 10:49 AM
To: 'Lee Wasserman'
Subject: RE: follow up

Lee – confirming our conversation just now, I have penciled in the early afternoons of Monday or Tuesday (2/23-24) for meeting re climate change and fossil fuel companies. Thanks for arranging this conversation, Lem

---

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Friday, February 06, 2015 12:34 PM
To: Lemuel Srolovic
Subject: FW: follow up

Hi, Lem,
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[redacted]
ROCKEFELLER FAMILY FUND

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[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

From: Larry Shapiro <lshapiro@rffund.org>
Sent: Friday, February 13, 2015 9:34 AM
To: Lemuel Srolovic; Steven Glassman
Cc: Lisa Hamilton (lisa_a_hamilton@yahoo.com)
Subject: FW: Paducah electricity rates climb to perhaps the highest in Kentucky after big bet on coal and other problems

---

From: prairiestatetrackers@googlegroups.com [mailto:prairiestatetrackers@googlegroups.com] **On Behalf Of** David Schlissel
Sent: Friday, February 13, 2015 9:15 AM
To: prairiestatetrackers@googlegroups.com
Subject: Re: Paducah electricity rates climb to perhaps the highest in Kentucky after big bet on coal and other problems

Good story. Great quotes Sandy.

____
David A. Schlissel
Schlissel Technical Consulting
45 Horace Road
Belmont, MA 02478
[redacted]

From: Sandy Buchanan <sbuchanan@ieefa.org>
Reply-To: <prairiestatetrackers@googlegroups.com>
Date: Friday, February 13, 2015 at 9:06 AM
To: <prairiestatetrackers@googlegroups.com>
Subject: Paducah electricity rates climb to perhaps the highest in Kentucky after big bet on coal and other problems

Good morning everyone, here is a very comprehensive story on Prairie State from today's Louisville Courier Journal:

http://www.courier-journal.com/story/tech/science/environment/2015/02/13/paducah-power-bets-coal-loses-prairie-state-energy-campus/23322435/

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You received this message because you are subscribed to the Google Groups "Prairiestatetrackers" group.
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For more options, visit https://groups.google.com/d/optout.

[redacted]

From: Bevis Longstreth <blongstreth@mindspring.com>
Sent: Monday, February 16, 2015 1:52 PM
To: Lemuel Srolovic
Subject: FW: Climate Public Trust, Divestment, and SCC Litigation Group Update
Attachments: RI Feb 16 2015 Fiduciary case.pdf; WSJ Feb 13 2014 Climate Activists Look to Courts.pdf

Here's update on the case in UK I told you about a while ago. Any movement in the AG office? The time is right to put out an interpretative release. Bevis

---

From: Julian Poulter [mailto:julian.poulter@aodproject.net]
Sent: Monday, February 16, 2015 11:54 AM
To: David Weiskopf; Bevis Longstreth
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: RE: Climate Public Trust, Divestment, and SCC Litigation Group Update

FYI attached from Friday's Wall Street Journal and todays RI. It was always going to be difficult to keep the story under wraps!
Regards
Julian

From: David Weiskopf [mailto:dweiskopf@nextgenamerica.org]
Sent: 23 January 2015 01:05
To: Bevis Longstreth; Julian Poulter
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Adding Julian Poulter from AODP to this list.

From: David Weiskopf <dweiskopf@nextgenamerica.org>
Date: Thursday, January 15, 2015 at 6:24 AM
To: Bevis Longstreth <blongstreth@mindspring.com>
Cc: Ted White <twhite@fahrllc.com>, Dan Lashof <dlashof@nextgenamerica.org>, Trip Van Noppen <tvannoppen@earthjustice.org>, "Rudy E. Verner" <rev@bhgrlaw.com>, "Doniger, David" <ddoniger@nrdc.org>, David Nicholas <dnicholas@verizon.net>, Vic Sher <vic@vicsherlaw.com>, Robert Massie <rkmassie@gmail.com>, Jamie Court <jamie@consumerwatchdog.org>
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

I neglected to mention yesterday, but the Our Children's Trust case in Oregon is moving forward, and will have a hearing on competing motions for summary judgment this March: http://www.oregonlive.com/environment/index.ssf/2015/01/eugene_teens_who_sued_gov_john.html

All the best,
Dave

On Jan 14, 2015, at 7:20 PM, Bevis Longstreth <blongstreth@mindspring.com> wrote:

Hi David. Thanks for all this. Look forward to reading and informing myself. I continue to like the idea of a well conceived law suit. Cheers. Bevis

From: David Weiskopf [mailto:dweiskopf@nextgenamerica.org]
Sent: Wednesday, January 14, 2015 1:15 PM
To: Bevis Longstreth; 'Ted White'; Daniel Lashof; 'Trip Van Noppen'; 'Rudy E. Verner'; 'Doniger, David'; 'David Nicholas'; 'Vic Sher'; Robert Massie; Jamie Court
Subject: Climate Public Trust, Divestment, and SCC Litigation Group Update

Hi All,

I'm writing to pass along this interesting resource Ted alerted me to pertaining to the applicability of the Public Trust Doctrine to rights to the atmosphere in the context of climate change litigation: http://johnjberger.com/2015/01/08/applying-the-public-trust-doctrine-to-climate-change-using-atmospheric-trust-litigation/. Bill Moyers recently interviewed one of the Plaintiffs in the series of cases being brought by Our Children's Trust. The full interview is available here. The group's federal case, which sought recognition of a federal public trust duty was denied cert in December, with the Court affirming that Public Trust Doctrine is a matter of state law. I've attached that case's cert petition to this message.

The atmospheric trust theory is articulated by Professor Mary Wood in her book *Nature's Trust; Environmental Law for a New Ecological Age (*an excerpt is available here). Wood sees her work in bringing these lawsuits as integral with demonstrations of popular democracy seen in recent years in the People's Climate March, Keystone XL protests, and other climate activism, but she does not view her lawsuits as purely symbolic or as acts of protest — she is working from the premise that the courts can and do update legal principles in response to broader societal changes, making this moment the right time to push for legal recognition for climate-related claims. As she described to Moyers, "Judges can, if they sense the need, move very rapidly and order swift injunctions to force the legislatures or agencies, or both, to create a carbon reduction plan. And as that awareness becomes more acute, as demonstrated in the streets, courts, I believe, will become more receptive to coming in and ordering the legislatures to do their job."

In a related matter, the Harvard students who have brought a lawsuit against the University to compel divestment from fossil fuels have submitted their memo in opposition to defendants' motions to dismiss. The court is now considering the motions and may schedule a hearing. Please let me know if you'd like a copy of any of the filings in that case.

Also in Divestment news, approximately 300 Stanford faculty have signed on to a letter calling for the University to extend its divestment from coal to include natural gas and oil investments as well. 10 Stanford Law faculty signed onto the letter, along with professors from a broad cross-section of the University's schools and departments. The full letter and list of signatories is available here.

Finally, I also wanted to call attention to recent research from Stanford indicating that current estimates of the Social Cost of Carbon are far too low. It is generally known that the SCC is an underestimate because it excludes many unquantified or unquantifaible impacts from the cost estimate. These researchers have applied modeling techniques to estimate one of these excluded effects — GDP suppression from temperature spikes — and determined that a more appropriate cost would be about $220/ton, as opposed to $37/ton (which is the number currently in use). The the extent that revised NEPA rules and other environmental statutes require an estimate of climate impacts or a quantification of costs and benefits, this research provides an interesting new data point that may need to be considered, especially for those agencies bound by "best available science" standards.

All the best and a Happy 2015 to you all,
Dave

--
David Weiskopf

Attorney
NextGen Climate America
https://nextgenamerica.org/
111 Sutter Street
San Francisco, CA 94104
Dweiskopf@nextgenamerica.org
[redacted]

responsible-investor.com
ESG and sustainable finance

Keywords:
» Europe
» United Kingdom
» Asset Owners
» Class actions
» Legislation & Regulation

Latest News:
UK pension fund faces groundbreaking legal test case on fiduciary duty and climate change

UK Parliament pension fund rejects call to assess fossil fuel investment

RI People & Appointments, Feb. 16: Archbishop Welby takes responsible investment advisory role at F&C

Responsible Funds, February 13: ASB sustainability fund, Greencoat Wind, Impax AM

RI's Global Divestment Day round-up: California pension funds, Carbon Tracker, Vermont, Harvard, NZ Super etc.

UK pension fund faces groundbreaking legal test case on fiduciary duty and climate change

Green light expected shortly on lawsuit to challenge asset owner's position on financial implications of environmental damage.

by Hugh Wheelan | February 16 h, 2015

A UK pension fund is facing a legal test case by members alleging hat it is breaching its fiduciary duty by not considering he potential impacts of climate change on its investments.

The lawsuit could send shockwaves hrough he institutional investment industry and lead to similar cases internationally.

If launched, it would challenge whe her pension funds must respond to issues such as potentially stranded fossil fuel assets and long-term climate damage across their assets. Pension funds often manage money for generations of scheme members wi h liabilities stretching out 50+ years into the future, he time-frame over which numerous high-level, governmental scientific papers say serious climate damage will occur unless C02 emissions are dramatically reduced.

RI understands that the groundbreaking lawsuit will target one of the laggard pension funds in he UK country ranking of the Asset Owner Disclosure Project (AODP), the not-for-profit group that evaluates pension scheme management of climate change risks and opportunities. The AODP declined to comment. The name of he pension fund is not known, but is it is likely to be a large scheme. The lawsuit will argue that there are financial implications for members' assets that the pension scheme is not taking into account.

At a meeting in London last week, up to 40 professionals including lawyers, NGOs, climate specialists and public relations firms, were finalising details of the case.

Sources at the mee ing said the test case was waiting for the green light from Client Earth, he London-based 'environmental' law firm, which will lead he case. The firm counts the band Coldplay and former Roxy Music keyboard player Brian Eno amongst its high-profile supporters. Client Earth declined to comment. The case would involve members of the pension scheme taking their own pension fund to court over the alleged fiduciary duty breach.

Client Earth is known for its advocacy, litigation and research on climate change hemes.

In October last year, RI reported that the law firm was building a 'Climate Litigation Team' with candidates expected to have "a strong understanding of UK company law and/or financial and investment law and the wider legal frameworks governing the regula ion of, decision making by, and legal liabilities affec ing companies and those who invest in companies based in the UK".

Client Earth is still looking for a mid to senior level solicitor or barrister to lead what it calls its 'Company and Financial Project', a core ini iative within he Climate Li iga ion Team.

The job advert says: "The Project involves making groundbreaking legal interventions using company and financial laws, with the objective of accelera ing he transi ion to a low carbon economy. These interventions include shareholder resolutions and complaints to regulators as well as litigation."

The role will commence in May 2015. RI's sources say this would be he likely start date for a fiduciary legal case. The boundaries of fiduciary duty have been under regulatory scrutiny in he UK. In October last year, UK Business Secretary, Vince Cable, said he government would amend rules on fiduciary duty to clarify how pension trustees should address ESG factors as part of its implementation of the Kay Review of UK equity markets. One of the government's responses to a related report by the Law Commission that advises it on legal changes, includes a proposed amendment – curren ly under consultation – of the Occupational Pension Scheme (Investment) Regula ions, to clarify the term "social, environmental or ethical considerations" and make a clearer distinc ion between financial factors and non-financial factors.

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MONEYBEAT

10:34 am ET
Feb 13, 2015 FUNDS

On 'Global Divestment Day,' Some Climate Activists Look to Courts

By MICHAEL J. CASEY

—Getty Images

Harvard's, Yale's and other universities' endowments have rejected student activists' calls to divest stakes in carbon-producing companies, highlighting the limits of the moral crusade that environmentalists have waged against institutional investors to force action against climate change threats.

Horizons
By Michael J. Casey
COMMENTARY

But with the movement celebrating "Global Divestment Day" Friday, it's a fitting time to note the quiet development of an entirely different, legalistic approach, one that could arm the activists with a powerful new weapon: a court order.

A global amalgam of lawyers, financial professionals, pension fund contr butors and labor representatives is exploring the prospects for a groundbreaking lawsuit against thousands of pension funds. They argue that fund trustees have breached a fiduciary duty to their members by not considering the risk of future climate-change-related losses in setting asset managers' portfolio allocation guidelines.

A successful class-action motion would render moot free-loader concerns that many funds have voiced in [redacted] Harvard and Yale, for example, was that ... opportunities for less-socially consciou... nanagement.

The prospective litiga... ome nebulous sense of social respo... evidence points to a high probability that investment returns will eventually be undermined, either directly by climate change phenomena such as rising sea levels or indirectly via regulation to contain those effects. Trustees, these people contend, are obliged to manage or hedge against those risks because the time horizon of their members stretches out for decades.

"I'm not a greenie," says Julian Poulter, chief executive officer of the Asset Owners Disclosure Project, a not-for-profit now laying the groundwork for a major lawsuit. AODP "exists only to drive long-term investors to price climate risk properly in the interests of their members and stakeholders," he adds.

Of the $40 trillion in assets held by pension funds listed on AODP's rankings of climate-change preparedness, "50% of those portfolios are exposed to high-carbon investments," estimates Mr. Poulter, with only 2% dedicated to low-carbon assets. "That's a 25-1 gamble on business as usual … about the same odds as drawing a black ace in a game of poker."

If a successful lawsuit were to lead to a wholesale reweighting of portfolios out of, say, big oil producers' shares and into relatively less profitable and illiquid businesses such as wind farms, funds would almost certainly suffer large initial losses. With pension funds accounting for more than 50% of world stock holdings, lost market capitalization could easily run into trillions of dollars. That's led some to question whether aggressive legal action could be counterproductive for fund beneficiaries.

A study of a hypothetical divested portfolio published this week by University of Chicago Law School Professor Daniel Fischel found that it underperformed an un-divested portfolio over the past 50 years by 0.7 percentage point every year.

The study was immediately attacked by pro-divestment group 350.org, which said it "cherry-picks data," is backward looking, and was funded by the Independent Petroleum Association of America. Mr. Fischel said there was no conflict of interest as he'd conducted an "academic-level study" with "no contribution or input from anyone from the industry association." He also argued that historical analysis was a widely accepted approach to measuring portfolio performance and that current share prices should already reflect investor concerns about the well-telegraphed risks of climate change.

Some people in favor of greater mitigation of climate change risks are also concerned about the unintended consequences of widespread, mass divestment of fossil fuel producers. Tim McDonald, a senior fellow at the Capital Institute, worries about the devastating economic impact of "shutting down a core industry almost in the prime of its life." Instead, he says, bigger pension funds should aggressively use their voting power to engage companies such as coal miners into changing their long-term business models.

Still, litigants won't be calling on courts to tell funds how and when to divest. Rather, they're focused on "due process," says William A. Sokol, a lawyer at Weinberg Roger & Rosenfeld in San Francisco, on the "question of what basic due diligence [trustees] have done in considering the long-term risk imposed by climate change." So long as funds demonstrate they've done their homework, they should free to hedge against the risks as they see fit.

All this hinges on the centuries-old principle of fiduciary duty, the idea that anyone charged with managing property on behalf of others has unique obligations to act in the latter's interests. The recent financial crisis brought the issue to the fore, but climate change, which Domini Social Investments Managing Director Adam M. Kanzer calls "the mother of all systemic risks," promises to make it an even more contentious one.

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On one side sit people like the University of Chicago's Mr. Fischel, who says "it would be a great mistake to interpret fiduciary duties to mean that investment managers have to become experts on climate change and predict future prices."

But on the other, Keith L. Johnson, a lawyer at Reinhart Boerner Van Deuran in Madison, Wisconsin, says that a relentless focus on short-term returns, a trend driven by fund manager compensation models, has left investment trustees failing to exercise "impartiality," potentially in breach of fiduciary duty. They've privileged older pension fund beneficiaries over younger contributors, he says.

This industry-wide, systemically driven "short-termism" lies at heart the problem, says AODP's Mr. Poulter. It means younger pension fund contributors aren't maximizing their long-term returns and so makes a mockery of the "efficient market" concepts that dictate arguments such as Mr. Fischel's about current share prices capturing future risks.

In other words, there's more at stake here than a debate over how to value climate change risk. It's about an ingrained system of incentives and power relationships that have led the professional investment industry to act in its own interests rather than in those of the ordinary people's whose savings keep it ticking over.

Investment Banking Scorecard

Updated February 13, 2015

The Dealogic and WSJ scorecard breaks down the investment banking industry by region, product, bank and sector.

Below shows year-on-year global volume and top 10 banks in $ billions and global investment banking revenue and top 10 banks in $ millions:

Equity Capital Markets	$94.2	16% ▲
Debt Capital Markets	$745.1	-13% ▼
Investment Banking Revenue	$7,103.5	-20% ▼

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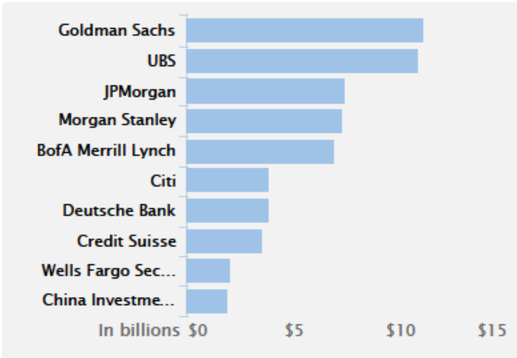

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[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Tuesday, February 17, 2015 2:08 PM
To: Lemuel Srolovic
Cc: Steven Glassman
Subject: Monday meeting

Lem, we're looking forward to our meeting on Monday at 1 pm. We believe the information presented will squarely address Steve's question at our last meeting. I hope Steve will be able to join us to hear about the details. I also hope the investigator who was at the first meeting can be there (afraid I didn't get his name).

Thanks for your assistance with this.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 3:15 PM
To: Steven Glassman; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: FW: Monday meeting

Steven and John – Lee requested this follow-on meeting for 2/23 at 1:00. I presume that we'll host in EPB, but haven't worked out logistical details. Wanted to make sure you have date and time. Lem

---

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Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER
FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 3:18 PM
To: Alvin Bragg
Subject: FW: Monday meeting

[redacted]

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Sent: Tuesday, February 17, 2015 3:15 PM
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Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

From: Alvin Bragg
Sent: Tuesday, February 17, 2015 3:26 PM
To: Lemuel Srolovic
Subject: Re: Monday meeting

I think it is fine to keep the invite list where you have it. Thanks.

Message sent from a Blackberry device

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 03:18 PM
To: Alvin Bragg
Subject: FW: Monday meeting

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 3:15 PM
To: Steven Glassman; John Oleske
Cc: Michael J. Myers; Alvin Bragg
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Steven and John – Lee requested this follow-on meeting for 2/23 at 1:00. I presume that we'll host in EPB, but haven't worked out logistical details. Wanted to make sure you have date and time. Lem

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From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Tuesday, February 17, 2015 2:08 PM
To: Lemuel Srolovic
Cc: Steven Glassman
Subject: Monday meeting

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Thanks for your assistance with this.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

[redacted]

From: Steven Glassman
Sent: Tuesday, February 17, 2015 4:04 PM
To: Lemuel Srolovic; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: RE: Monday meeting

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[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

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Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 4:20 PM
To: Alvin Bragg
Subject: RE: Monday meeting

Great. Thanks.

From: Alvin Bragg
Sent: Tuesday, February 17, 2015 3:26 PM
To: Lemuel Srolovic
Subject: Re: Monday meeting

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475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

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To: Lemuel Srolovic; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: RE: Monday meeting

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Director
475 Riverside Drive, Suite 900 | New York, NY 10115
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ROCKEFELLER FAMILY FUND

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Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 5:21 PM
To: Steven Glassman; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: RE: Monday meeting

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Sent: Tuesday, February 17, 2015 5:11 PM
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Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Tuesday, February 17, 2015 6:51 PM
To: Lemuel Srolovic
Subject: Re: Monday meeting

Hi, Lem,
Yes I'll be able to put together some top lines for you so you'll get a sense of what we're planning to share. Should be in a day or two. Thanks.

Lee Wasserman
Rockefeller Family Fund

On Feb 17, 2015, at 2:17 PM, Lemuel Srolovic <Lemuel.Srolovic@ag.ny.gov> wrote:

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> Thanks for your assistance with this.
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]
> <image001.png>

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 18, 2015 8:02 AM
To: 'lwasserman@rffund.org'
Subject: Re: Monday meeting

Excellent. Thanks, Lee.

Message sent from a Blackberry device

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Tuesday, February 17, 2015 06:51 PM Eastern Standard Time
To: Lemuel Srolovic
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> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]
> <image001.png>

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 18, 2015 8:58 AM
To: 'blongstreth@mindspring.com'
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Bevis -- thank you for this update. Do you have time tomorrow or Friday to talk? I'd like to update you on our developments and a couple of potential asks. I have a gap tomorrow 2-5 and Friday 1-4. If this week's not good, next week works too. Regards, Lem

Message sent from a Blackberry device

From: Bevis Longstreth [mailto:blongstreth@mindspring.com]
Sent: Monday, February 16, 2015 01:52 PM Eastern Standard Time
To: Lemuel Srolovic
Subject: FW: Climate Public Trust, Divestment, and SCC Litigation Group Update

Here's update on the case in UK I told you about a while ago. Any movement in the AG office? The time is right to put out an interpretative release. Bevis

---

From: Julian Poulter [mailto:julian.poulter@aodproject.net]
Sent: Monday, February 16, 2015 11:54 AM
To: David Weiskopf; Bevis Longstreth
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: RE: Climate Public Trust, Divestment, and SCC Litigation Group Update

FYI attached from Friday's Wall Street Journal and todays RI. It was always going to be difficult to keep the story under wraps!
Regards
Julian

From: David Weiskopf [mailto:dweiskopf@nextgenamerica.org]
Sent: 23 January 2015 01:05
To: Bevis Longstreth; Julian Poulter
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Adding Julian Poulter from AODP to this list.

From: David Weiskopf <dweiskopf@nextgenamerica.org>
Date: Thursday, January 15, 2015 at 6:24 AM
To: Bevis Longstreth <blongstreth@mindspring.com>
Cc: Ted White <twhite@fahrllc.com>, Dan Lashof <dlashof@nextgenamerica.org>, Trip Van Noppen <tvannoppen@earthjustice.org>, "Rudy E. Verner" <rev@bhgrlaw.com>, "Doniger, David" <ddoniger@nrdc.org>, David Nicholas <dnicholas@verizon.net>, Vic Sher <vic@vicsherlaw.com>, Robert Massie <rkmassie@gmail.com>, Jamie Court

<jamie@consumerwatchdog.org>
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

I neglected to mention yesterday, but the Our Children's Trust case in Oregon is moving forward, and will have a hearing on competing motions for summary judgment this March: http://www.oregonlive.com/environment/index.ssf/2015/01/eugene_teens_who_sued_gov_john.html

All the best,
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> **Sent:** Wednesday, January 14, 2015 1:15 PM
> **To:** Bevis Longstreth; 'Ted White'; Daniel Lashof; 'Trip Van Noppen'; 'Rudy E. Verner'; 'Doniger, David'; 'David Nicholas'; 'Vic Sher'; Robert Massie; Jamie Court
> **Subject:** Climate Public Trust, Divestment, and SCC Litigation Group Update
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> Hi All,
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> I'm writing to pass along this interesting resource Ted alerted me to pertaining to the applicability of the Public Trust Doctrine to rights to the atmosphere in the context of climate change litigation: http://johnjberger.com/2015/01/08/applying-the-public-trust-doctrine-to-climate-change-using-atmospheric-trust-litigation/. Bill Moyers recently interviewed one of the Plaintiffs in the series of cases being brought by Our Children's Trust. The full interview is available here. The group's federal case, which sought recognition of a federal public trust duty was denied cert in December, with the Court affirming that Public Trust Doctrine is a matter of state law. I've attached that case's cert petition to this message.
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All the best and a Happy 2015 to you all,
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David Weiskopf

Attorney
NextGen Climate America
https://nextgenamerica.org/
111 Sutter Street
San Francisco, CA 94104
Dweiskopf@nextgenamerica.org
[redacted]

[redacted]

From: Bevis Longstreth <blongstreth@mindspring.com>
Sent: Wednesday, February 18, 2015 10:54 AM
To: Lemuel Srolovic
Subject: RE: Climate Public Trust, Divestment, and SCC Litigation Group Update

Tomorrow 2-5pm works for me. I am at [redacted]. Look forward to speaking.

From: Lemuel Srolovic [mailto:Lemuel.Srolovic@ag.ny.gov]
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David Weiskopf

Attorney
NextGen Climate America
https://nextgenamerica.org/
111 Sutter Street
San Francisco, CA 94104
Dweiskopf@nextgenamerica.org
[redacted]

[redacted]

From: John Oleske
Sent: Wednesday, February 18, 2015 5:45 PM
To: Lemuel Srolovic; Steven Glassman
Cc: Michael J. Myers; Alvin Bragg
Subject: Re: Monday meeting

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Sent: Tuesday, February 17, 2015 2:08 PM
To: Lemuel Srolovic
Cc: Steven Glassman
Subject: Monday meeting

Lem, we're looking forward to our meeting on Monday at 1 pm. We believe the information presented will squarely address Steve's question at our last meeting. I hope Steve will be able to join us to hear about the details. I also hope the investigator who was at the first meeting can be there (afraid I didn't get his name).

Thanks for your assistance with this.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER
FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 18, 2015 6:44 PM
To: John Oleske
Subject: Re: Monday meeting

Got it. Thanks, John.

Message sent from a Blackberry device

From: John Oleske
Sent: Wednesday, February 18, 2015 05:44 PM Eastern Standard Time
To: Lemuel Srolovic; Steven Glassman
Cc: Michael J. Myers; Alvin Bragg
Subject: Re: Monday meeting

I can do a 1pm meeting start on Monday but not much later.

Message sent from a Blackberry device

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 04:18 PM
To: Steven Glassman; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: Re: Monday meeting

Not a lot but believe that it's info re ExxonMobil's activity re climate denial. I'll try to get further clarification.

Message sent from a Blackberry device

From: Steven Glassman
Sent: Tuesday, February 17, 2015 04:03 PM Eastern Standard Time
To: Lemuel Srolovic; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: RE: Monday meeting

I'm available then. Is there any more information on what Lee has in mind?

From: Lemuel Srolovic
Sent: Tuesday, February 17, 2015 3:15 PM
To: Steven Glassman; John Oleske
Cc: Michael J. Myers; Alvin Bragg
Subject: FW: Monday meeting

Steven and John – Lee requested this follow-on meeting for 2/23 at 1:00. I presume that we'll host in EPB, but haven't worked out logistical details. Wanted to make sure you have date and time. Lem

---

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ROCKEFELLER
FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, February 18, 2015 8:54 PM
To: 'blongstreth@mindspring.com'
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Thanks. I'll plan on calling you as close to 2 as possible.

Message sent from a Blackberry device

From: Bevis Longstreth [mailto:blongstreth@mindspring.com]
Sent: Wednesday, February 18, 2015 10:54 AM Eastern Standard Time
To: Lemuel Srolovic
Subject: RE: Climate Public Trust, Divestment, and SCC Litigation Group Update

Tomorrow 2-5pm works for me. I am at [redacted] Look forward to speaking.

From: Lemuel Srolovic [mailto:Lemuel.Srolovic@ag.ny.gov]
Sent: Wednesday, February 18, 2015 8:58 AM
To: 'blongstreth@mindspring.com'
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Bevis -- thank you for this update. Do you have time tomorrow or Friday to talk? I'd like to update you on our developments and a couple of potential asks. I have a gap tomorrow 2-5 and Friday 1-4. If this week's not good, next week works too. Regards, Lem

Message sent from a Blackberry device

From: Bevis Longstreth [mailto:blongstreth@mindspring.com]
Sent: Monday, February 16, 2015 01:52 PM Eastern Standard Time
To: Lemuel Srolovic
Subject: FW: Climate Public Trust, Divestment, and SCC Litigation Group Update

Here's update on the case in UK I told you about a while ago. Any movement in the AG office? The time is right to put out an interpretative release. Bevis

---

From: Julian Poulter [mailto:julian.poulter@aodproject.net]
Sent: Monday, February 16, 2015 11:54 AM
To: David Weiskopf; Bevis Longstreth
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: RE: Climate Public Trust, Divestment, and SCC Litigation Group Update

FYI attached from Friday's Wall Street Journal and todays RI. It was always going to be difficult to keep the story under wraps!
Regards
Julian

From: David Weiskopf [mailto:dweiskopf@nextgenamerica.org]
Sent: 23 January 2015 01:05
To: Bevis Longstreth; Julian Poulter
Cc: Ted White; Daniel Lashof; Trip Van Noppen; Rudy E. Verner; Doniger, David; David Nicholas; Vic Sher; Robert Massie; Jamie Court
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

Adding Julian Poulter from AODP to this list.

From: David Weiskopf <dweiskopf@nextgenamerica.org>
Date: Thursday, January 15, 2015 at 6:24 AM
To: Bevis Longstreth <blongstreth@mindspring.com>
Cc: Ted White <twhite@fahrllc.com>, Dan Lashof <dlashof@nextgenamerica.org>, Trip Van Noppen <tvannoppen@earthjustice.org>, "Rudy E. Verner" <rev@bhgrlaw.com>, "Doniger, David" <ddoniger@nrdc.org>, David Nicholas <dnicholas@verizon.net>, Vic Sher <vic@vicsherlaw.com>, Robert Massie <rkmassie@gmail.com>, Jamie Court <jamie@consumerwatchdog.org>
Subject: Re: Climate Public Trust, Divestment, and SCC Litigation Group Update

I neglected to mention yesterday, but the Our Children's Trust case in Oregon is moving forward, and will have a hearing on competing motions for summary judgment this March: http://www.oregonlive.com/environment/index.ssf/2015/01/eugene_teens_who_sued_gov_john.html

All the best,
Dave

On Jan 14, 2015, at 7:20 PM, Bevis Longstreth <blongstreth@mindspring.com> wrote:

> Hi David. Thanks for all this. Look forward to reading and informing myself. I continue to like the idea of a well conceived law suit. Cheers. Bevis
>
> ---
>
> **From:** David Weiskopf [mailto:dweiskopf@nextgenamerica.org]
> **Sent:** Wednesday, January 14, 2015 1:15 PM
> **To:** Bevis Longstreth; 'Ted White'; Daniel Lashof; 'Trip Van Noppen'; 'Rudy E. Verner'; 'Doniger, David'; 'David Nicholas'; 'Vic Sher'; Robert Massie; Jamie Court
> **Subject:** Climate Public Trust, Divestment, and SCC Litigation Group Update
>
> Hi All,
>
> I'm writing to pass along this interesting resource Ted alerted me to pertaining to the applicability of the Public Trust Doctrine to rights to the atmosphere in the context of climate change litigation: http://johnjberger.com/2015/01/08/applying-the-public-trust-doctrine-to-climate-change-using-atmospheric-trust-litigation/. Bill Moyers recently interviewed one of the Plaintiffs in the series of cases being brought by Our Children's Trust. The full interview is available here. The group's federal case, which sought recognition of a federal public trust duty was denied cert in December, with the Court affirming that Public Trust Doctrine is a matter of state law. I've attached that case's cert petition to this message.
>
> The atmospheric trust theory is articulated by Professor Mary Wood in her book *Nature's Trust; Environmental Law for a New Ecological Age* (an excerpt is available here). Wood sees her work in bringing these lawsuits as integral with demonstrations of popular democracy seen in recent years in the People's Climate March, Keystone XL protests, and other climate activism, but she does not view her lawsuits as purely symbolic or as acts of protest — she is working from the premise that the courts can and do update legal principles in response to broader societal changes, making this moment the right time to push for legal

recognition for climate-related claims. As she described to Moyers, "Judges can, if they sense the need, move very rapidly and order swift injunctions to force the legislatures or agencies, or both, to create a carbon reduction plan. And as that awareness becomes more acute, as demonstrated in the streets, courts, I believe, will become more receptive to coming in and ordering the legislatures to do their job."

In a related matter, the Harvard students who have brought a lawsuit against the University to compel divestment from fossil fuels have submitted their memo in opposition to defendants' motions to dismiss. The court is now considering the motions and may schedule a hearing. Please let me know if you'd like a copy of any of the filings in that case.

Also in Divestment news, approximately 300 Stanford faculty have signed on to a letter calling for the University to extend its divestment from coal to include natural gas and oil investments as well. 10 Stanford Law faculty signed onto the letter, along with professors from a broad cross-section of the University's schools and departments. The full letter and list of signatories is available here.

Finally, I also wanted to call attention to recent research from Stanford indicating that current estimates of the Social Cost of Carbon are far too low. It is generally known that the SCC is an underestimate because it excludes many unquantified or unquantifaible impacts from the cost estimate. These researchers have applied modeling techniques to estimate one of these excluded effects — GDP suppression from temperature spikes — and determined that a more appropriate cost would be about $220/ton, as opposed to $37/ton (which is the number currently in use). The the extent that revised NEPA rules and other environmental statutes require an estimate of climate impacts or a quantification of costs and benefits, this research provides an interesting new data point that may need to be considered, especially for those agencies bound by "best available science" standards.

All the best and a Happy 2015 to you all,
Dave

--
David Weiskopf

Attorney
NextGen Climate America
https://nextgenamerica.org/
111 Sutter Street
San Francisco, CA 94104
Dweiskopf@nextgenamerica.org
[redacted]

[redacted]

From: spam@oag.state.ny.us
Sent: Friday, February 20, 2015 1:01 PM
To: Lemuel Srolovic
Subject: Quarantine Summary Email February 20, 2015

Quarantine summary email for lemuel.srolovic@ag.ny.gov

Displaying up to 250 messages.

Inbound Email Quarantine

Sender	Subject	Date	Size	Score	Reason
emsg-38e9-5b63-replie...	Join us to refresh your writi...	Feb 19	6K	0	RPA
lshapiro@rffund.org	FW: Bundling up in Paducah - ...	Feb 19	9K	320	UCE/spam
LDI@iqmailer.net	=?utf-8?Q?Cato Conference In ...	Feb 19	13K	510	UCE/spam
bounces+58369-5b97-le...	Last Chance, ESI Strategies f...	Feb 20	109K	0	RPA
A7LVtXkBYSrWozTyBxRDH...	MMFS Weekly e-News - All School	Feb 20	54K	785	UCE/spam

[redacted]

From: Micah Lasher
Sent: Friday, March 13, 2015 4:20 PM
To: Alvin Bragg; John Oleske; Steven Glassman; Lemuel Srolovic
Subject: FW: legal memo
Attachments: Legal memo DB 3-8-15.docx

[redacted]

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Friday, March 13, 2015 4:16 PM
To: Micah Lasher
Subject: legal memo

Memo we discussed.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

Privileged and Confidential
Draft of March 5, 2015

Bases for a Martin Act Investigation of Energy Companies

Summary

The Office of the New York Attorney General ("NYAG") should investigate whether leading energy companies are conducting a scam to prop up their share prices by minimizing the risk that climate change poses to their business models. That risk is simple: energy company valuations are driven by "proven reserves" of oil, gas, and coal. If the reserves cannot be used – because of regulation or an ecological disaster, two very real possibilities – energy stocks must fall. Energy companies prop up their current high valuations by disseminating misinformation about climate change and valuing reserves as if they had no chance of being stranded underground.

Under the Martin Act, this pattern of behavior may well constitute a scheme to defraud investors, misleading them into thinking that "proven reserves" are certain to be sold eventually. The NYAG should use the extraordinary provisions of the Martin Act to conduct a rifle-shot inquiry that will validate whether or not the scheme exists and is actionable.

The Martin Act

The first two paragraphs of the Martin Act (Section 352.1-2 of the NY General Business Law, Article 23-A) set out the NYAG's power to investigate the energy companies and give it the tools to do so efficiently. Obviously, the Martin Act gives the NYAG a mandate to investigate deceptions in the security markets such as the conduct outlined above. It also specifically mentions energy investments, giving the NYAG jurisdiction over "stocks . . . including oil and mineral deeds or leases and any interest therein . . . "

The NYAG has extremely broad discretion – it may investigate "[w]hen it shall appear to the [NYAG], either upon complaint or otherwise [that there is a scheme to defraud] . . . or [the NYAG] believes it to be in the public interest that an investigation be made." Our presentation to you constitutes an actionable complaint, and clearly it is in the public interest for the NYAG to look into this matter.

The Martin Act gives the NYAG subpoena power (Section 352.2), but it also allows the NYAG to issue interrogatories and demands for specific data: "[The NYAG] may in his discretion either require or permit [a corporation under investigation] to file with him a statement under oath or otherwise as to all the facts and circumstances concerning the subject matter which he believes it is to the public interest to investigate, and for that purpose may prescribe forms upon which such statements shall be made. The attorney-general may also require such other data and information as he may deem relevant and make such special and independent investigations as he may deem necessary in connection with the matter." (Section 352.1)

Companies being investigated by the NYAG have no choice but to comply. As long as the NYAG's Martin Act discovery requests relate to the investigation (defined by the NYAG), have some factual basis and precede the filing of a complaint, motions to quash are futile. Discovery recipients rarely litigate the point, but in one 2009 case a New York judge quoted with approval an earlier case that stated "[A]ll that the Attorney General need show in the face of a motion to quash is his authority, the relevance of the items sought, and some factual basis for his investigation." <u>People of the State of New York v. Thain</u>, (Sup. Ct. N.Y. County, March 18, 2009) at 3. http://online.wsj.com/public/resources/documents/merrillruling20090318.pdf

Martin Act investigations can also be completely confidential, so if a case fails to materialize the inquiry can be abandoned without publicity. Again, the <u>Thain</u> court quoted an earlier holding that the Martin Act gives "authority in the attorney-general to direct whether the inquiry in its entirety be secret or public." <u>Id.</u>, at 6.

<u>The Scheme to Overvalue "Proven Reserves"</u>

The scheme is simple: the energy companies know that climate change is real and that "proven reserves" must be discounted to reflect the risk of stranding. Publicly, however, they minimize the risk of climate change and deny that stranding is even possible. They do so to prop up their share prices, which are driven in large part by the amount of "proven reserves."

Parts of the scheme are already public. We know that energy companies accept climate change as real on an operational level, as is shown by their plans to drill under the polar ice cap once it is substantially reduced or completely melted. At the same time, we know that publicly they take the position that there is zero risk of stranded reserves – that is, that there is no chance that climate change will result in less carbon being burned. We also see them paying climate change deniers such as Dr. Willie Soon to spread doubts about the impact of burning reserves.

These facts alone are enough to warrant investigation: why should the oil companies believe one set of facts privately and promote another publicly? Why do they operate under the assumption that the climate is changing but mark their reserves as if it is not? Why do they pay proxies to promote views they understand to be false? What impact does this have on investors?

The energy companies have yet to be investigated on these key questions. The facts that are public today come from FOIA requests and investigative journalists. Focused discovery of the type outlined below will probably reveal the true scope of the scheme, showing internal knowledge of the reality of climate change, pressure to keep this knowledge out of the valuation of reserves because of the impact that would have on share price, and a consciously false public relations campaign. These are all the ingredients of a classic Martin Act fraud: a scheme to use false pretenses to prop up share prices.

Materiality

Depending on how the NYAG decides to proceed after completing its investigation, materiality may or may not be part of its case. Until the NYAG actually decides to sue, however, it is not an issue.

Martin Act cases based solely on omissions or misstatements must show materiality – that is, in a nutshell, that the omitted or misstated facts would have mattered to the average investor. That standard would be met by systematic mismarking of proven reserves.

If, however, the NYAG elects to proceed on the theory that the energy companies are engaged in a scheme to fraudulently prop up their stock prices by mismarking their books and disseminating misinformation, materiality -- while it would clearly be present -- would not necessarily have to be an element of the case. The Martin Act makes any such "scheme to defraud" illegal.

Relief

If the NYAG establishes a scheme to defraud by the energy companies, it should bring an action to enjoin it under Section 353. By publicizing the facts underlying the scheme and demanding that it cease, the NYAG will discharge its duty and render a lasting service to the people of New York (and the rest of the world). There is no need to pursue restitution unless the NYAG chooses to do so.

Streamlined Discovery

The NYAG is in a position to use unique Martin Act discovery tools to quickly determine whether it has a case or not, without getting buried in energy company documents. Using interrogatories, the NYAG could ask for:

- Identities of all outside spokespeople retained to address climate change
- A list of all payments to outside entities for studies of climate change or advocacy on climate change
- An explanation of how stranding risk is incorporated in the valuation of "proven reserves"

- Descriptions of all capital or operational expenditures that are based on projected changes in sea levels, polar ice coverage, or global temperatures

In addition to the foregoing, a subpoena for (1) copies of all internal studies of climate change (including sea level rise, changes to ice caps and extreme weather events), (2) any memoranda on climate change supplied to Board members, and (3) organizational charts or other information sufficient to show who at the company analyzes or projects climate change would round out the picture without being burdensome.

The responses to this discovery would be enough to let the NYAG know whether it has a likely case or not, and would help focus subsequent email discovery.

[redacted]

From: Micah Lasher
Sent: Friday, March 13, 2015 4:20 PM
To: Alvin Bragg; John Oleske; Steven Glassman; Lemuel Srolovic
Subject: FW: legal memo
Attachments: Legal memo DB 3-8-15.docx

[redacted]

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Friday, March 13, 2015 4:16 PM
To: Micah Lasher
Subject: legal memo

Memo we discussed.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
212.812.4252
ROCKEFELLER FAMILY FUND

[redacted]

From: Micah Lasher
Sent: Wednesday, March 18, 2015 6:04 PM
To: Steven Glassman
Cc: Alvin Bragg; Lemuel Srolovic; Janet Sabel
Subject: FW: legal memo

Steve – see below.

I think it would be helpful if you could open a direct line of communication with Brown (outside of some more formal, one-time conference call). Maybe he has an angle on this that we're not thinking of, or maybe he can come to see that he's wrong. Either way, it will help us reach resolution on this.

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Great idea to connect David with folks there. He is actually working for a not-for-profit in Boston. Here's his email and phone:

David Brown <daviddbrowniv@gmail.com>
[redacted]

Lee Wasserman

Director

475 Riverside Drive, Suite 900 | New York, NY 10115

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ROCKEFELLER FAMILY FUND

From: Micah Lasher <Micah.Lasher@ag.ny.gov>
Date: Wednesday, March 18, 2015 at 5:43 PM
To: Lee Wasserman <lwasserman@rffund.org>
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Lee,

What firm is David Brown at? I think there might be some value in our lawyers connecting directly with him.

Thanks,
Micah

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Saturday, March 14, 2015 8:17 AM
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Micah,
Thanks for having the team lean into this.

Too important not to get this right before proceeding, as you rightly made clear.

Mike Gerrard is abroad next week; perhaps we can talk soon thereafter?

Best, Lee

Lee Wasserman
Rockefeller Family Fund

On Mar 14, 2015, at 12:32 AM, Micah Lasher <Micah.Lasher@ag.ny.gov> wrote:

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[redacted]

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Sent: Wednesday, March 18, 2015 6:09 PM
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Cc: Alvin Bragg; Lemuel Srolovic; Janet Sabel
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Will do. Thanks.

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ROCKEFELLER
FAMILY FUND

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Lee Wasserman

Director

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[redacted]

ROCKEFELLER FAMILY FUND

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<Legal memo DB 3-8-15.docx>

[redacted]

From: Steven Glassman
Sent: Wednesday, March 18, 2015 10:27 PM
To: Lemuel Srolovic
Subject: Re: legal memo

Yes, under Spitzer. He then became head of the NY Dormitory Authority. Do you know what he's been up to since then, or who he's working for now?

Message sent from a Blackberry device

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To: Micah Lasher
Subject: Re: legal memo

Great idea to connect David with folks there. He is actually working for a not-for-profit in Boston. Here's his email and phone:

David Brown <daviddbrowniv@gmail.com>
[redacted]

Lee Wasserman

Director

475 Riverside Drive, Suite 900 | New York, NY 10115

[redacted]

ROCKEFELLER FAMILY FUND

From: Micah Lasher <Micah.Lasher@ag.ny.gov>
Date: Wednesday, March 18, 2015 at 5:43 PM
To: Lee Wasserman <lwasserman@rffund.org>
Subject: RE: legal memo

Lee,

What firm is David Brown at? I think there might be some value in our lawyers connecting directly with him.

Thanks,
Micah

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Saturday, March 14, 2015 8:17 AM
To: Micah Lasher
Subject: Re: legal memo

Micah,
Thanks for having the team lean into this.

Too important not to get this right before proceeding, as you rightly made clear.

Mike Gerrard is abroad next week; perhaps we can talk soon thereafter?

Best, Lee

Lee Wasserman
Rockefeller Family Fund

On Mar 14, 2015, at 12:32 AM, Micah Lasher <Micah.Lasher@ag.ny.gov> wrote:

> This is helpful.
>
> After our call I gathered our team and pressed them a bit on their views. I think there's a mix of legitimate skepticism and insufficient exploration. I asked everyone to go back to the drawing board first thing Monday so we can have a more fully informed call at the end of the week.
>
> Please do know that I want to find a way on this as much as you do. What you may have heard from me today was a bit of vexed struggle as I balance needing all the help from thought partners as we can get with protecting the prerogatives of our office and the judgment of our attorneys.
>
> Talk next week.
>
> MCL
>
> On Mar 13, 2015, at 4:16 PM, Lee Wasserman <lwasserman@rffund.org> wrote:
>
>> Memo we discussed.
>>
>> Lee Wasserman
>> Director
>> 475 Riverside Drive, Suite 900 | New York, NY 10115
>> [redacted]
>> <64D1D2E8-811D-40B8-85E0-93FF7C3B8280[47].png>
>>
>> <Legal memo DB 3-8-15.docx>

[redacted]

From: Micah Lasher
Sent: Wednesday, April 22, 2015 3:39 PM
To: Steven Glassman; Alvin Bragg; Janet Sabel; Lemuel Srolovic
Subject: FW: follow up
Attachments: NYAG 4-15-15F1(2).docx

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Wednesday, April 22, 2015 3:36 PM
To: Micah Lasher
Subject: follow up

Dear Micah,
Thanks for your consideration of the issues we've been discussing. I had hoped to have sent the attached memo to the AG earlier. We hope you will the opportunity to review the memo and share with him.
Sincerely,

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]

ROCKEFELLER FAMILY FUND

Martin Act Discovery Requests to Fossil Fuel Companies

The following memorandum sets out why the Office of the New York Attorney General ("NYAG") should investigate whether oil and coal ("fossil fuel") companies have engaged in a Martin Act scheme by spreading misinformation about climate change. The key conclusion is that the NYAG has a robust basis for doing so, based on the public record, and that the chance of Martin Act subpoenas being quashed is minimal.

Background

Your office has already received an overview of the fossil fuel industry's ongoing campaign to promote uncertainty around climate science. Highlights from that campaign include:

- The blueprint set out in the Global Climate Coalition (an oil industry front group) 1996 paper "Predicting Climate Change: A Primer," which recognizes the scientific basis for the Greenhouse Effect but advises an industry strategy of emphasizing uncertainty;
- The American Petroleum Institute's 1998 "Global Climate Science Communications Plan" to attack the climate science supporting international efforts to solve global warming;
- The Western Fuels Association's "Green Earth Society," which promoted the idea that carbon emissions are good for the planet as they will lead to a flourishing of plant life;
- The 2014 American Coalition for Clean Coal Electricity-funded study on the supposed benefits of carbon emissions for plant life; and
- An estimated $29 million in grants and gifts from ExxonMobil and $67 million from Koch Industries supporting climate change denial over the last 25 years.

The campaign of disinformation has been on the front page of *The New York Times*, which reported on February 21, 2015 that Dr. Wei-Hock Soon, a scientist at the Harvard-Smithsonian Center for Astrophysics who claims that changes in the sun explain climate change, received more than $1.2 million from certain companies in the fossil fuel industry over the last decade without disclosure.

At the same time that they have pursued a communications strategy designed to promote doubt about climate change in the public domain, some fossil fuel companies have begun to acknowledge it as a serious risk in their financial disclosures. See "When legally liable, companies don't dispute global warming," EE News, March 19, 2015, http://www.eenews.net/greenwire/stories/1060015376 (copy attached). For example, Peabody Energy Corp., the world's largest private-sector coal company, repeatedly questioned climate change science in its December 2014 comments on the EPA's Clean Power Plan. In its 2014 10-K discussion of material risks, however, it simply stated that this science has "engendered concern about the impacts of human activity, especially fossil fuel combustion, on global climate issues" without mentioning that it is engaged in an effort to debunk climate science. Similarly, ExxonMobil – one of the companies that have funded Dr. Soon – issued a report in April of 2014 stating that it "takes the risk of climate change seriously, and continues to take meaningful steps to address the risk and ensure that our facilities, operations and investments are managed with this risk in mind."

These are fine examples of corporate doublespeak -- saying one thing publicly and another in disclosure documents – designed to mislead investors as to the fossil fuel companies' true positions on climate change. To get an accurate picture of that, investors would have to supplement their reading of official disclosure documents with an effort to ferret out EPA comments, secret payments to scientists like Dr. Soon, initiatives funneled through front organizations, etc.

Three Possible Martin Act Theories

While there is no need for the NYAG to settle on a particular theory of Martin Act liability before launching discovery, the undisputed and public facts set out above give at least three possible bases for an eventual enforcement action:

(1) At the very least, the above inconsistent messaging suggests an ongoing effort to mislead investors as to the fossil fuel companies' true position on climate change. Any deceptive practice relating to securities violates the Martin Act. Here we see fossil fuel issuers making incomplete and misleading disclosures on climate change – an issue that goes to the heart of their ongoing profitability -- describing it solemnly as a risk without disclosing that they spend corporate funds to attack its scientific underpinnings. Similarly, fossil fuel companies discount the risk of effective environmental regulation in public disclosures, without revealing that they are the key actors in the effort to prevent such regulation. Such misleading disclosures violate the Martin Act.

(2) In addition, the fossil fuel companies would not be fighting climate change science if it did not impact their business models and therefore their share prices. As has been thoroughly reported, then-Exxon CEO Lee Raymond opined that worldwide regulatory regime to address climate change was a singular threat to the company. He thereafter committed Exxon to a multi-dimensional effort to confuse the public about climate science. See "Exxon's 25 Year 'Drop Dead' Denial Campaign" in *Oil*

Change International, April 14, 2014, http://priceofoil.org/2014/04/14/exxons-25-year-drop-dead-denial-campaign/. Spreading misinformation to prop up share prices is a Martin Act scheme.

(3) Finally, the fossil fuel companies' stock prices are driven in large part by their reserves. These are at risk of being stranded if they cannot be used. The companies value them as if there is no risk of stranding. Their own internal analyses of climate change – consistent with their financial disclosure – may well show that this risk is very real and the reserves are therefore being overvalued. Mismarking critical assets is a Martin Act violation.

The NYAG's Martin Act Authority

As you said in a speech at New York Law School last year:

" . . . the Martin Act, which I hope you've heard of, empowers my office, and our Investor Protection Bureau in particular, to investigate pretty much any fraudulent or deceptive practice in financial dealings."

The first two paragraphs of the Martin Act (Section 352.1-2 of the NY General Business Law, Article 23-A) set out the NYAG's power to investigate such deceptive practices and give it the tools to do so efficiently. Obviously, the Martin Act gives the NYAG a mandate to investigate publicly traded securities such as fossil fuel stocks. It also specifically mentions energy investments, giving the NYAG jurisdiction over "stocks . . . including oil and mineral deeds or leases and any interest therein . . . "

The NYAG has extremely broad discretion – it may investigate "[w]hen it shall appear to the [NYAG], either upon complaint or otherwise [that there is a scheme to defraud] . . . or [the NYAG] believes it to be in the public interest that an investigation be made." Our presentation to you constitutes an actionable complaint, and it is clearly in the public interest for the NYAG to look into this matter.

Martin Act Discovery

The Martin Act gives the NYAG subpoena power (Section 352.2), but it also allows the NYAG to issue interrogatories and demands for specific data: "[The NYAG] may in his discretion either require or permit [a corporation under investigation] to file with him a statement under oath or otherwise as to all the facts and circumstances concerning the subject matter which he believes it is to the public interest to investigate, and for that purpose may prescribe forms upon which such statements shall be made. The attorney-general may also require such other data and information as he may deem relevant and make such special and independent investigations as he may deem necessary in connection with the matter." (Section 352.1)

The NYAG is in a position to use these unique Martin Act discovery tools to quickly determine whether it has a case or not, without getting buried in energy company documents. Using interrogatories, the NYAG could ask for:

- Identities of all outside spokespeople who address climate change
- A list of all payments to outside entities for studies of climate change or advocacy on climate change
- An explanation of how stranding risk is incorporated in the valuation of "proven reserves"
- Descriptions of all capital or operational expenditures or expected expenditures that are based on projected changes in sea levels, polar ice coverage, or global temperatures

In addition to the foregoing, a subpoena could be issued for (1) copies of all internal studies of climate change (including sea level rise, changes to ice caps and extreme weather events), and memoranda on how climate change or any of these phenomena (whether or not attributed to climate change) presents financial or other risks and/or opportunities to the company (2) any memoranda or other documents on climate change or any of these phenomena supplied to Board members, and (3) organizational charts or other information sufficient to show who at the company analyzes or projects climate change or any of these phenomena. This information would round out the picture without being burdensome.

The responses to this discovery would be enough to let the NYAG know whether it has a likely case or not, and would help focus subsequent email discovery.

Motions to Quash

Your staff is concerned that the fossil fuel companies might succeed in motions to quash subpoenas aimed at their spreading misinformation about climate change. This fear is misplaced.

Motions to quash Martin Act subpoenas are rare and have never succeeded. A survey of reported decisions from the New York courts indicates that 17 decisions involving motions to quash subpoenas issued under the Martin Act have issued since the 1920s. In not a single case did a court quash a Martin Act subpoena issued by the New York Attorney General. Your staff was likewise unable to identify a single such precedent as of several weeks ago.

In one 2009 opinion a New York judge quoted with approval an earlier case that stated "[A]ll that the Attorney General need show in the face of a motion to

quash is his authority, the relevance of the items sought, and some factual basis for his investigation." People of the State of New York v. Thain (Sup. Ct. N.Y. County, March 18, 2009) at 3. The Thain court noted that the attorney general enjoys a presumption that his investigatory powers have been invoked "in good faith" and that he therefore is "not required to demonstrate probable cause or disclose the details of the pending investigation." Id.
http://online.wsj.com/public/resources/documents/merrillruling20090318.pdf.

As long as the NYAG's Martin Act discovery requests relate to the investigation (defined by the NYAG), have some factual basis and precede the filing of a complaint, motions to quash are futile. The evidence set out in this memorandum provides more than sufficient factual basis for the NYAG to win a motion to quash.

Your staff has cited the 2014 *Airbnb* decision as an example of a successful motion to quash. See *Airbnb, Inc. v. Eric T. Schneiderman*, Attorney General of the State of New York (Sup. Ct. Albany County, May 13, 2014).
https://www.nycourts.gov/press/PDFs/AirbnbDecision.pdf. That decision, however, did not involve a Martin Act subpoena, but rather an inquiry under the Executive Law into possible violations of the New York Multiple Dwelling Law. The court in *Airbnb* held that there was adequate factual basis for the subpoena, but that it was overbroad in that it sought information clearly beyond the scope of the Multiple Dwelling Law (which applies to dwellings in cities with populations of 325,000 or more and recognizes that stays of 30 days or more constitute "permanent residence."). There are no similar limiting provisions for the Martin Act, and the NYAG can easily craft targeted discovery (as discussed above) that will not be burdensome for the fossil fuel companies.

Your office can reduce the chance of motions to quash ever being filed by sending out initial discovery requests without alerting the press. Martin Act investigations can be completely confidential, so if a case fails to materialize the inquiry can be abandoned without publicity. Again, the Thain court quoted an earlier holding that the Martin Act gives "authority in the attorney-general to direct whether the inquiry in its entirety be secret or public." Id., at 6. Initial confidentiality will put the fossil fuel companies in the position of breaking the story themselves if they choose to fight discovery. As public companies, they may well opt not to be the ones to publicize the inquiry.

*   *   *

Your staff has also raised concerns about (1) what showing of materiality would be required in an enforcement action, and (2) what relief the NYAG would seek in such an action. We address each of these below.

Materiality

Depending on how the NYAG decides to proceed after completing its investigation, materiality may or may not be part of its case. Until the NYAG actually decides to sue, however, it is not an issue.

Martin Act cases based solely on omissions or misstatements must show materiality – that is, in a nutshell, that the omitted or misstated facts would have mattered to the average investor. That standard would certainly be met by secret dissemination of misinformation concerning the fossil fuel companies' risks (and the future of our planet).

If, however, the NYAG elects to proceed on the theory that the energy companies are engaged in a scheme to fraudulently prop up their stock prices by disseminating misinformation, materiality would not necessarily have to be an element of the case. The Martin Act makes any such "scheme to defraud" illegal.

Relief

If the NYAG establishes a scheme to defraud by the energy companies, it should bring an action to enjoin it under Section 353. By publicizing the facts underlying the scheme and demanding that it cease, the NYAG will discharge its duty and render a lasting service to the people of New York (and the rest of the world). Once the facts are known, the NYAG can decide to pursue restitution if justified.

Conclusion

The NYAG has a unique opportunity to protect New York's investing public and while so doing change the climate debate in the U.S. and beyond. It should pursue this matter with the full investigatory powers provided the NYAG under the Martin Act.

GREENWIRE

COAL:
When legally liable, companies don't dispute global warming

Corbin Hiar and Manuel Quiñones, E&E reporters
Published: Thursday, March 19, 2015

U.S. coal companies that are publicly skeptical of man-made climate change acknowledge in mandatory financial disclosures the widely accepted scientific link between fossil fuel emissions and a warming planet, a *Greenwire* analysis has found.

Sustainable investment advocates warn that such doublespeak undermines the industry's credibility with shareholders. And scientific integrity experts are critical of the coal companies' climate communication strategy, which they argue is detrimental to the long-term health and security of the American people.
The highest profile practitioner of targeted climate messaging is Peabody Energy Corp., the world's largest private-sector coal company. Peabody produced more than 180 million short tons of coal -- or nearly 19 percent of national output -- in 2013, according to U.S. Energy Information Administration data.
Peabody repeatedly questioned climate science in its December 2014 comments on U.S. EPA's Clean Power Plan, a regulatory effort meant to force states to cut emissions of planet-warming carbon dioxide released from existing coal-fired power plants.

"The climate science upon which EPA relies cannot sustain this dramatic step to remake a significant sector of the American economy," the company said in a 145-page attack on the proposed emission limits.

It then referenced the work of the Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC), which EPA used to declare CO2 a pollutant.
"Even if the IPCC report were taken at face value (and it is deeply flawed and should not be accepted at face value), the IPCC has steadily downgraded its projections since 2007. It now predicts a slow and moderate warming trend that the IPCC's own data and own scientists have indicated will be *net beneficial* to the world," Peabody wrote, and then noted CO2 promotes plant growth and reduces heating costs and cold-related health problems.

Existing climate models are "fatally flawed," the company went on to assert, citing a divergence between predicted atmospheric warming and actual warming that is largely explained by increasing deep ocean temperatures.
"These concerns cannot be brushed aside," Peabody said.
But in the required annual performance summary the coal giant filed with the U.S. Securities and Exchange Commission last month, the company appeared to do just that.

In a section of Peabody's 2014 10-K **report** that discusses risks that "could materially and adversely affect our business," the company acknowledges that IPCC reports have "engendered concern about the impacts of human activity, especially fossil fuel combustion, on global climate issues." No mention was made of the allegedly unreliable science that underpinned those reports from the IPCC. The company then said "increasing government attention is being paid to global climate issues and to emissions of what are commonly referred to as greenhouse gases, including emissions of carbon dioxide from coal combustion by power plants." It went on to downplay the impact any potential climate laws, regulations or other actions could have on its bottom line.

"Outside of SEC filings, companies might feel freer to lobby," said Betty Moy Huber, an expert in environmental law and corporate compliance issues at Davis Polk & Wardwell LLP. "Within an SEC filing, there is a whole different set of liability standards, and they would be ill-advised to say something that cannot be legally backed up."

Publicly traded companies tend to be candid in their 10-K filings because not doing so could result in litigation from investors or regulatory scrutiny if those annual disclosure reports are found to be misleading.

'Reputation risk'

But disclosure advocates express concern when a company's SEC filing appears to differ from other communications.

"That information does not square," said Jim Coburn, a manager at the sustainable investment group Ceres, responding to Peabody's statements. Along with research group CookESG, Ceres created the SEC climate disclosure search **tool** that *Greenwire* used to comb through 10-Ks.

"That's a real problem for the company because the company is misleading investors in its SEC filings," Coburn said. For investors "to understand the company's true stance on climate issues," they would have to seek out its EPA comments, as well as weigh the significance of its trade group memberships and political contributions, he said.

The difference between the straightforward disclosures Peabody made to the SEC and the statements included in its EPA comments poses a "reputation risk problem," Coburn added. Investors may no longer believe what the company says about other threats to its business since -- in the case of climate change, at least -- it prefers to pretend that some risks don't exist, he suggested.

This type of inconsistent messaging extends beyond the climate issue, according to industry critics.

When mines have closed, for instance, some coal companies have loudly blamed the layoffs on Obama administration regulations. At the same time, however, they have offered a more nuanced explanation of their woes to investors, which are mostly the result of competition from abundant natural gas and the spread of renewables.

Peabody pushed back against any suggestions that the company is espousing contradictory views.

"Peabody's position on carbon and climate and on the importance of continuing to develop clean coal technologies to address the issues has been consistent over time," the company said in a statement, which was limited by what it can legally say about its SEC disclosures.

Widespread practice

Alpha Natural Resources Inc. -- which produced nearly 9 percent of U.S. coal in 2013, the market's fourth-highest share -- also clearly explained the link between global warming and fossil fuel consumption in the regulatory and legal risks section of its 2014 10-K **filing**.

Kevin Crutchfield, chief executive officer of Alpha Natural Resources Inc., during an interview in New York in September 2014. Photo by Victor J. Blue/Bloomberg courtesy of Getty Images.

"Global climate change continues to attract considerable public and scientific attention," Alpha said. "There is concern in particular about the emissions of GHGs [or greenhouse gases], such as carbon dioxide and methane."

The company's document says, "Combustion of fossil fuels like coal and gas results in the creation of carbon dioxide, which is currently emitted into the atmosphere by coal and gas end users, such as coal-fired electric power generators. As a result, there have been and are expected to be numerous GHG emissions initiatives that could reduce the demand for coal."

During a March 2012 event, however, Alpha CEO Kevin Crutchfield cast doubt on the connection between fossil fuel consumption and climate change. He declared that EPA limits on power plant CO_2 emissions "would be hugely problematic," in part because of uncertainty about global warming, which 97 percent of climate scientists say is very likely caused by human activities.

"It does seem like something is going on," he said in response to a question about climate change, according to West Virginia's *Charleston Gazette*.

But he added that "the question that has to be asked is, 'Is mankind contributing to that?' I don't really know the answer to that."

An Alpha spokesman did not respond to a request for comment.

Companies' 'most material' risk

The SEC issued guidance in 2010 specifically requiring companies to disclose any physical impacts climate change may be having on their operations (***ClimateWire***, Jan. 28, 2010).

Environmentalists considered it a major win. But industry advocates -- both inside and outside the SEC -- said the science wasn't settled enough for the requirement, which some lawmakers tried to overturn.

U.S. coal companies have sought to satisfy these requirements by generally discussing climate change in their 10-Ks in terms of current or potential government scrutiny. But Peabody, Alpha and other majors like Cloud Peak

Energy Inc. and Arch Coal Inc. tend to steer clear of climate-related infrastructure issues posed by sea-level rise or the potential for increasingly severe natural disasters.
"It is possible that future international, federal and state initiatives to control GHG emissions could result in increased costs associated with coal production and consumption," Alliance Resource Partners LP said in one representative passage.

Such efforts could require Alliance's utility industry customers "to install additional controls to reduce carbon dioxide emissions or costs to purchase emissions reduction credits to comply with future emissions trading programs," the company said in its 10-K.

Bob Murray speaking to reporters in August 2007 near Huntington, Utah. Photo by Justin Sullivan courtesy of Getty Images.
Huber said the SEC requires companies to disclose material impacts related to climate change. "Much of it is judgment," she said, "of what a company believes is material."

Beyond physical impacts, Huber said companies must also report whether rules and regulations could hurt the bottom line. For U.S. coal companies, climate change regulations may indeed be "the most material item," she said.
A 2013 Congressional Research Service **report**, citing other studies -- including ones conducted by Ceres and Davis Polk -- said the new SEC guidance had not dramatically changed the reporting habits of many companies. It also suggested the SEC was not cracking down on those who didn't follow the guidelines.
The guidance, however, does not apply to Murray Energy Corp., which is also among the largest U.S. coal producers. The company's private ownership means it doesn't have to file annual disclosure reports with the SEC.
That has left CEO Robert Murray free to offer unrelenting criticism of the climate change science without ever having to show how or if his company is preparing for global warming.

"In the late 1980s, environmental alarmists and liberal politicians and elitists attempted to scare us with the terrible consequences of 'acid rain,'" Murray said during a speech last year. "Today, their platform is 'global warming.'"

Earning shareholder trust
Not all extraction companies focus on regulatory burdens when talking about global warming. International mining giant Rio Tinto PLC, for example, has long been outspoken about the impacts of climate change on its operations.
"We operate in a complex and interconnected world where global and local issues -- such as biodiversity, climate change, livelihoods, and regional economic development -- bring both risk and opportunity to the design, development and management of our operations," its most recent annual report told investors.
"Mining, smelting, refining and infrastructure installations are vulnerable to natural events including earthquakes, subsidence, drought, flood, fire, storm and

climate change," the report says.

Huber, the corporate-compliance attorney, said companies with a strong European presence tend to be more vocal about potential physical climate change impacts, responding to investor wishes. "As compared to U.S. companies, it is more important to them, and they are more conscious about it," she said, "and the reporting tends to be more fulsome and varied."
Coal companies could better earn shareholders' trust, said Ceres' Coburn, by being more candid about the risk climate change poses to their businesses, not just associated with regulations.

That was the main message Ceres and a group of 70 global investors managing more than $3 trillion of collective assets delivered to 45 fossil fuel-dependent corporations almost two years ago (***ClimateWire***, Oct. 25, 2013).
While companies have a right to vocally oppose regulations they believe could harm shareholders, they shouldn't do so by spreading misinformation, said Gretchen Goldman, lead analyst at the Center for Science and Democracy, a Union of Concerned Scientists project.
"They do not have a right to misrepresent scientific facts," Goldman said. "This is an issue that has seen a tremendous amount of misinformation, and so for them to be spreading that misinformation or otherwise supporting misrepresentations of climate science is immoral and not appropriate."
Twitter: **@corbinhiar** | Email: **chiar@eenews.net**

[redacted]

From: Steven Glassman
Sent: Thursday, April 23, 2015 1:45 PM
To: Micah Lasher
Cc: Alvin Bragg; Janet Sabel; Lemuel Srolovic
Subject: RE: follow up

I've reviewed this latest incarnation of the fossil fuel company climate change subpoena suggestion, and can give you my reaction whenever you're interested.

From: Micah Lasher
Sent: Wednesday, April 22, 2015 3:39 PM
To: Steven Glassman; Alvin Bragg; Janet Sabel; Lemuel Srolovic
Subject: FW: follow up

From: Lee Wasserman [mailto:lwasserman@rffund.org]
Sent: Wednesday, April 22, 2015 3:36 PM
To: Micah Lasher
Subject: follow up

Dear Micah,
Thanks for your consideration of the issues we've been discussing. I had hoped to have sent the attached memo to the AG earlier. We hope you will the opportunity to review the memo and share with him.
Sincerely,

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

From: Micah Lasher
Sent: Wednesday, September 16, 2015 1:45 PM
To: Alvin Bragg; Janet Sabel; Steven Glassman; Lemuel Srolovic
Cc: Simon Brandler
Subject: Fwd: big news
Attachments: 9FFC3469-8ADD-4D30-A674-692287935301[143].png

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** September 16, 2015 at 9:57:55 AM EDT
> **To:** Micah Lasher <Micah.Lasher@ag.ny.gov>
> **Subject: big news**
>
> Exxon's own scientists knew since at least '80s that climate was real. More to come. Hope you're well.
>
> http://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-role-in-global-warming
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]

[redacted]

From: Lemuel Srolovic
Sent: Thursday, September 17, 2015 11:59 AM
To: Micah Lasher; Alvin Bragg; Steven Glassman; Janet Sabel
Cc: Simon Brandler
Subject: RE: big news

[redacted]

From: Micah Lasher
Sent: Wednesday, September 16, 2015 1:45 PM
To: Alvin Bragg; Janet Sabel; Steven Glassman; Lemuel Srolovic
Cc: Simon Brandler
Subject: Fwd: big news

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** September 16, 2015 at 9:57:55 AM EDT
> **To:** Micah Lasher <Micah.Lasher@ag.ny.gov>
> **Subject: big news**
>
> Exxon's own scientists knew since at least '80s that climate was real. More to come. Hope you're well.
>
> http://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-role-in-global-warming
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]

[redacted]

From: Micah Lasher
Sent: Friday, September 18, 2015 3:48 PM
To: Simon Brandler; Lemuel Srolovic
Subject: Fwd: more background
Attachments: 9FFC3469-8ADD-4D30-A674-692287935301[173].png

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** September 18, 2015 at 3:41:13 PM EDT
> **To:** Micah Lasher <Micah.Lasher@ag.ny.gov>
> **Cc:** Bill Lipton <blipton@workingfamilies.org>, Daniel Cantor <dcantor@workingfamilies.org>
> **Subject: more background**
>
> Some context:
> http://www.newyorker.com/news/daily-comment/what-exxon-knew-about-climate-change
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]

[redacted]

From: Micah Lasher
Sent: Thursday, October 29, 2015 11:08 AM
To: Steven Glassman; Lemuel Srolovic; Simon Brandler; Alvin Bragg; Janet Sabel
Subject: Fwd: Exxon
Attachments: 9FFC3469-8ADD-4D30-A674-692287935301[903].png

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** October 29, 2015 at 11:01:12 AM EDT
> **To:** "Micah.Lasher@ag.ny.gov" <Micah.Lasher@ag.ny.gov>
> **Subject: Exxon**
>
> http://seekingalpha.com/article/3618726-making-the-legal-case-against-exxon-mobil
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]

[redacted]

From: Lemuel Srolovic
Sent: Thursday, October 29, 2015 2:40 PM
To: Mandy DeRoche; Kevin Olson
Cc: Monica Wagner
Subject: FW: Exxon
Attachments: 9FFC3469-8ADD-4D30-A674-692287935301[903].png

[redacted]

From: Micah Lasher
Sent: Thursday, October 29, 2015 11:08 AM
To: Steven Glassman; Lemuel Srolovic; Simon Brandler; Alvin Bragg; Janet Sabel
Subject: Fwd: Exxon

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** October 29, 2015 at 11:01:12 AM EDT
> **To:** "Micah.Lasher@ag.ny.gov" <Micah.Lasher@ag.ny.gov>
> **Subject: Exxon**
>
> http://seekingalpha.com/article/3618726-making-the-legal-case-against-exxon-mobil
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]

[redacted]

From: Karla Sanchez
Sent: Monday, November 9, 2015 11:57 AM
To: Micah Lasher; Lemuel Srolovic
Subject: FW: follow up
Attachments: NYAG 4-15-15F1(2).docx; ATT00001.htm

Do either of you have the paper they refer to about the "overview of the fossil fuel industry's ongoing campaign to promote uncertainty around climate science"?

Karla

From: Micah Lasher
Sent: Friday, November 06, 2015 2:25 PM
To: Karla Sanchez
Subject: Fwd: follow up

Begin forwarded message:

> **From:** Micah Lasher <Micah.Lasher@ag.ny.gov>
> **Date:** July 10, 2015 at 2:12:43 PM EDT
> **To:** Simon Brandler <Simon.Brandler@ag.ny.gov>
> **Subject: Fwd: follow up**
>
> Begin forwarded message:
>
> > **From:** Lee Wasserman <lwasserman@rffund.org>
> > **Date:** April 22, 2015 at 1:35:55 PM MDT
> > **To:** Micah Lasher <Micah.Lasher@ag.ny.gov>
> > **Subject: follow up**
> >
> > Dear Micah,
> > Thanks for your consideration of the issues we've been discussing. I had hoped to have sent the attached memo to the AG earlier. We hope you will the opportunity to review the memo and share with him.
> > Sincerely,
> >
> > Lee Wasserman
> > Director
> > 475 Riverside Drive, Suite 900 | New York, NY 10115
> > [redacted]

Privileged and Confidential
Draft of April 17, 2015

Martin Act Discovery Requests to Fossil Fuel Companies

The following memorandum sets out why the Office of the New York Attorney General ("NYAG") should investigate whether oil and coal ("fossil fuel") companies have engaged in a Martin Act scheme by spreading misinformation about climate change. The key conclusion is that the NYAG has a robust basis for doing so, based on the public record, and that the chance of Martin Act subpoenas being quashed is minimal.

Background

Your office has already received an overview of the fossil fuel industry's ongoing campaign to promote uncertainty around climate science. Highlights from that campaign include:

- The blueprint set out in the Global Climate Coalition (an oil industry front group) 1996 paper "Predicting Climate Change: A Primer," which recognizes the scientific basis for the Greenhouse Effect but advises an industry strategy of emphasizing uncertainty;
- The American Petroleum Institute's 1998 "Global Climate Science Communications Plan" to attack the climate science supporting international efforts to solve global warming;
- The Western Fuels Association's "Green Earth Society," which promoted the idea that carbon emissions are good for the planet as they will lead to a flourishing of plant life;
- The 2014 American Coalition for Clean Coal Electricity-funded study on the supposed benefits of carbon emissions for plant life; and
- An estimated $29 million in grants and gifts from ExxonMobil and $67 million from Koch Industries supporting climate change denial over the last 25 years.

The campaign of disinformation has been on the front page of *The New York Times*, which reported on February 21, 2015 that Dr. Wei-Hock Soon, a scientist at the Harvard-Smithsonian Center for Astrophysics who claims that changes in the sun explain climate change, received more than $1.2 million from certain companies in the fossil fuel industry over the last decade without disclosure.

At the same time that they have pursued a communications strategy designed to promote doubt about climate change in the public domain, some fossil fuel companies have begun to acknowledge it as a serious risk in their financial disclosures. See "When legally liable, companies don't dispute global warming," EE News, March 19, 2015, http://www.eenews.net/greenwire/stories/1060015376 (copy attached). For example, Peabody Energy Corp., the world's largest private-sector coal company, repeatedly questioned climate change science in its December 2014 comments on the EPA's Clean Power Plan. In its 2014 10-K discussion of material risks, however, it simply stated that this science has "engendered concern about the impacts of human activity, especially fossil fuel combustion, on global climate issues" without mentioning that it is engaged in an effort to debunk climate science. Similarly, ExxonMobil – one of the companies that have funded Dr. Soon – issued a report in April of 2014 stating that it "takes the risk of climate change seriously, and continues to take meaningful steps to address the risk and ensure that our facilities, operations and investments are managed with this risk in mind."

These are fine examples of corporate doublespeak -- saying one thing publicly and another in disclosure documents – designed to mislead investors as to the fossil fuel companies' true positions on climate change. To get an accurate picture of that, investors would have to supplement their reading of official disclosure documents with an effort to ferret out EPA comments, secret payments to scientists like Dr. Soon, initiatives funneled through front organizations, etc.

Three Possible Martin Act Theories

While there is no need for the NYAG to settle on a particular theory of Martin Act liability before launching discovery, the undisputed and public facts set out above give at least three possible bases for an eventual enforcement action:

(1) At the very least, the above inconsistent messaging suggests an ongoing effort to mislead investors as to the fossil fuel companies' true position on climate change. Any deceptive practice relating to securities violates the Martin Act. Here we see fossil fuel issuers making incomplete and misleading disclosures on climate change – an issue that goes to the heart of their ongoing profitability -- describing it solemnly as a risk without disclosing that they spend corporate funds to attack its scientific underpinnings. Similarly, fossil fuel companies discount the risk of effective environmental regulation in public disclosures, without revealing that they are the key actors in the effort to prevent such regulation. Such misleading disclosures violate the Martin Act.

(2) In addition, the fossil fuel companies would not be fighting climate change science if it did not impact their business models and therefore their share prices. As has been thoroughly reported, then-Exxon CEO Lee Raymond opined that worldwide regulatory regime to address climate change was a singular threat to the company. He thereafter committed Exxon to a multi-dimensional effort to confuse the public about climate science. See "Exxon's 25 Year 'Drop Dead' Denial Campaign" in *Oil*

Change International, April 14, 2014, http://priceofoil.org/2014/04/14/exxons-25-year-drop-dead-denial-campaign/. Spreading misinformation to prop up share prices is a Martin Act scheme.

(3) Finally, the fossil fuel companies' stock prices are driven in large part by their reserves. These are at risk of being stranded if they cannot be used. The companies value them as if there is no risk of stranding. Their own internal analyses of climate change – consistent with their financial disclosure – may well show that this risk is very real and the reserves are therefore being overvalued. Mismarking critical assets is a Martin Act violation.

The NYAG's Martin Act Authority

As you said in a speech at New York Law School last year:

" . . . the Martin Act, which I hope you've heard of, empowers my office, and our Investor Protection Bureau in particular, to investigate pretty much any fraudulent or deceptive practice in financial dealings."

The first two paragraphs of the Martin Act (Section 352.1-2 of the NY General Business Law, Article 23-A) set out the NYAG's power to investigate such deceptive practices and give it the tools to do so efficiently. Obviously, the Martin Act gives the NYAG a mandate to investigate publicly traded securities such as fossil fuel stocks. It also specifically mentions energy investments, giving the NYAG jurisdiction over "stocks . . . including oil and mineral deeds or leases and any interest therein . . . "

The NYAG has extremely broad discretion – it may investigate "[w]hen it shall appear to the [NYAG], either upon complaint or otherwise [that there is a scheme to defraud] . . . or [the NYAG] believes it to be in the public interest that an investigation be made." Our presentation to you constitutes an actionable complaint, and it is clearly in the public interest for the NYAG to look into this matter.

Martin Act Discovery

The Martin Act gives the NYAG subpoena power (Section 352.2), but it also allows the NYAG to issue interrogatories and demands for specific data: "[The NYAG] may in his discretion either require or permit [a corporation under investigation] to file with him a statement under oath or otherwise as to all the facts and circumstances concerning the subject matter which he believes it is to the public interest to investigate, and for that purpose may prescribe forms upon which such statements shall be made. The attorney-general may also require such other data and information as he may deem relevant and make such special and independent investigations as he may deem necessary in connection with the matter." (Section 352.1)

The NYAG is in a position to use these unique Martin Act discovery tools to quickly determine whether it has a case or not, without getting buried in energy company documents. Using interrogatories, the NYAG could ask for:

- Identities of all outside spokespeople who address climate change
- A list of all payments to outside entities for studies of climate change or advocacy on climate change
- An explanation of how stranding risk is incorporated in the valuation of "proven reserves"
- Descriptions of all capital or operational expenditures or expected expenditures that are based on projected changes in sea levels, polar ice coverage, or global temperatures

In addition to the foregoing, a subpoena could be issued for (1) copies of all internal studies of climate change (including sea level rise, changes to ice caps and extreme weather events), and memoranda on how climate change or any of these phenomena (whether or not attributed to climate change) presents financial or other risks and/or opportunities to the company (2) any memoranda or other documents on climate change or any of these phenomena supplied to Board members, and (3) organizational charts or other information sufficient to show who at the company analyzes or projects climate change or any of these phenomena. This information would round out the picture without being burdensome.

The responses to this discovery would be enough to let the NYAG know whether it has a likely case or not, and would help focus subsequent email discovery.

Motions to Quash

Your staff is concerned that the fossil fuel companies might succeed in motions to quash subpoenas aimed at their spreading misinformation about climate change. This fear is misplaced.

Motions to quash Martin Act subpoenas are rare and have never succeeded. A survey of reported decisions from the New York courts indicates that 17 decisions involving motions to quash subpoenas issued under the Martin Act have issued since the 1920s. In not a single case did a court quash a Martin Act subpoena issued by the New York Attorney General. Your staff was likewise unable to identify a single such precedent as of several weeks ago.

In one 2009 opinion a New York judge quoted with approval an earlier case that stated "[A]ll that the Attorney General need show in the face of a motion to quash is his authority, the relevance of the items sought, and some factual basis for his investigation." People of the State of New York v. Thain (Sup. Ct. N.Y. County, March 18, 2009) at 3. The Thain court noted that the attorney general enjoys a presumption that his investigatory powers have been invoked "in good faith" and that he therefore is "not required to demonstrate probable cause or disclose the details of the pending investigation." Id. http://online.wsj.com/public/resources/documents/merrillruling20090318.pdf.

As long as the NYAG's Martin Act discovery requests relate to the investigation (defined by the NYAG), have some factual basis and precede the filing of a complaint, motions to quash are futile. The evidence set out in this memorandum provides more than sufficient factual basis for the NYAG to win a motion to quash.

Your staff has cited the 2014 *Airbnb* decision as an example of a successful motion to quash. See *Airbnb, Inc. v. Eric T. Schneiderman*, Attorney General of the State of New York (Sup. Ct. Albany County, May 13, 2014). https://www.nycourts.gov/press/PDFs/AirbnbDecision.pdf. That decision, however, did not involve a Martin Act subpoena, but rather an inquiry under the Executive Law into possible violations of the New York Multiple Dwelling Law. The court in *Airbnb* held that there was adequate factual basis for the subpoena, but that it was overbroad in that it sought information clearly beyond the scope of the Multiple Dwelling Law (which applies to dwellings in cities with populations of 325,000 or more and recognizes that stays of 30 days or more constitute "permanent residence."). There are no similar limiting provisions for the Martin Act, and the NYAG can easily craft targeted discovery (as discussed above) that will not be burdensome for the fossil fuel companies.

Your office can reduce the chance of motions to quash ever being filed by sending out initial discovery requests without alerting the press. Martin Act investigations can be completely confidential, so if a case fails to materialize the inquiry can be abandoned without publicity. Again, the Thain court quoted an earlier holding that the Martin Act gives "authority in the attorney-general to direct whether the inquiry in its entirety be secret or public." Id., at 6. Initial confidentiality will put the fossil fuel companies in the position of breaking the story themselves if they choose to fight discovery. As public companies, they may well opt not to be the ones to publicize the inquiry.

*   *   *

Your staff has also raised concerns about (1) what showing of materiality would be required in an enforcement action, and (2) what relief the NYAG would seek in such an action. We address each of these below.

Materiality

Depending on how the NYAG decides to proceed after completing its investigation, materiality may or may not be part of its case. Until the NYAG actually decides to sue, however, it is not an issue.

Martin Act cases based solely on omissions or misstatements must show materiality – that is, in a nutshell, that the omitted or misstated facts would have mattered to the average investor. That standard would certainly be met by secret dissemination of misinformation concerning the fossil fuel companies' risks (and the future of our planet).

If, however, the NYAG elects to proceed on the theory that the energy companies are engaged in a scheme to fraudulently prop up their stock prices by disseminating misinformation, materiality would not necessarily have to be an element of the case. The Martin Act makes any such "scheme to defraud" illegal.

Relief

If the NYAG establishes a scheme to defraud by the energy companies, it should bring an action to enjoin it under Section 353. By publicizing the facts underlying the scheme and demanding that it cease, the NYAG will discharge its duty and render a lasting service to the people of New York (and the rest of the world). Once the facts are known, the NYAG can decide to pursue restitution if justified.

Conclusion

The NYAG has a unique opportunity to protect New York's investing public and while so doing change the climate debate in the U.S. and beyond. It should pursue this matter with the full investigatory powers provided the NYAG under the Martin Act.

GREENWIRE

COAL:

When legally liable, companies don't dispute global warming

Corbin Hiar and Manuel Quiñones, E&E reporters

Published: Thursday, March 19, 2015

U.S. coal companies that are publicly skeptical of man-made climate change acknowledge in mandatory financial disclosures the widely accepted scientific link between fossil fuel emissions and a warming planet, a *Greenwire* analysis has found.

Sustainable investment advocates warn that such doublespeak undermines the industry's credibility with shareholders. And scientific integrity experts are critical of the coal companies' climate communication strategy, which they argue is detrimental to the long-term health and security of the American people.

The highest profile practitioner of targeted climate messaging is Peabody Energy Corp., the world's largest private-sector coal company. Peabody produced more than 180 million short tons of coal -- or nearly 19 percent of national output -- in 2013, according to U.S. Energy Information Administration data.

Peabody repeatedly questioned climate science in its December 2014 comments on U.S. EPA's Clean Power Plan, a regulatory effort meant to force states to cut emissions of planet-warming carbon dioxide released from existing coal-fired power plants.

"The climate science upon which EPA relies cannot sustain this dramatic step to remake a significant sector of the American economy," the company said in a 145-page attack on the proposed emission limits.

It then referenced the work of the Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC), which EPA used to declare CO_2 a pollutant.

"Even if the IPCC report were taken at face value (and it is deeply flawed and should not be accepted at face value), the IPCC has steadily downgraded its projections since 2007. It now predicts a slow and moderate warming trend that the IPCC's own data and own scientists have indicated will be *net beneficial* to the world," Peabody wrote, and then noted CO_2 promotes plant growth and reduces heating costs and cold-related health problems.

Existing climate models are "fatally flawed," the company went on to assert, citing a divergence between predicted atmospheric warming and actual warming that is largely explained by increasing deep ocean temperatures.

"These concerns cannot be brushed aside," Peabody said.

But in the required annual performance summary the coal giant filed with the U.S. Securities and Exchange Commission last month, the company appeared to do just that.

In a section of Peabody's 2014 10-K **report** that discusses risks that "could materially and adversely affect our business," the company acknowledges that IPCC reports have "engendered concern about the impacts of human activity, especially fossil fuel combustion, on global climate issues." No mention was made of the allegedly unreliable science that underpinned those reports from the IPCC. The company then said "increasing government attention is being paid to global climate issues and to emissions of what are commonly referred to as greenhouse gases, including emissions of carbon dioxide from coal combustion by power plants." It went on to downplay the impact any potential climate laws, regulations or other actions could have on its bottom line.

"Outside of SEC filings, companies might feel freer to lobby," said Betty Moy Huber, an expert in environmental law and corporate compliance issues at Davis Polk & Wardwell LLP. "Within an SEC filing, there is a whole different set of liability standards, and they would be ill-advised to say something that cannot be legally backed up."

Publicly traded companies tend to be candid in their 10-K filings because not doing so could result in litigation from investors or regulatory scrutiny if those annual disclosure reports are found to be misleading.

'Reputation risk'

But disclosure advocates express concern when a company's SEC filing appears to differ from other communications.

"That information does not square," said Jim Coburn, a manager at the sustainable investment group Ceres, responding to Peabody's statements. Along with research group CookESG, Ceres created the SEC climate disclosure search **tool** that *Greenwire* used to comb through 10-Ks.

"That's a real problem for the company because the company is misleading investors in its SEC filings," Coburn said. For investors "to understand the company's true stance on climate issues," they would have to seek out its EPA comments, as well as weigh the significance of its trade group memberships and political contributions, he said.

The difference between the straightforward disclosures Peabody made to the SEC and the statements included in its EPA comments poses a "reputation risk problem," Coburn added. Investors may no longer believe what the company says about other threats to its business since -- in the case of climate change, at least -- it prefers to pretend that some risks don't exist, he suggested.

This type of inconsistent messaging extends beyond the climate issue, according to industry critics.

When mines have closed, for instance, some coal companies have loudly blamed the layoffs on Obama administration regulations. At the same time, however, they have offered a more nuanced explanation of their woes to investors, which are mostly the result of competition from abundant natural gas and the spread of renewables.

Peabody pushed back against any suggestions that the company is espousing contradictory views.

"Peabody's position on carbon and climate and on the importance of continuing to develop clean coal technologies to address the issues has been consistent over time," the company said in a statement, which was limited by what it can legally say about its SEC disclosures.

Widespread practice

Alpha Natural Resources Inc. -- which produced nearly 9 percent of U.S. coal in 2013, the market's fourth-highest share -- also clearly explained the link between global warming and fossil fuel consumption in the regulatory and legal risks section of its 2014 10-K **filing**.

Kevin Crutchfield, chief executive officer of Alpha Natural Resources Inc., during an interview in New York in September 2014. Photo by Victor J. Blue/Bloomberg courtesy of Getty Images.

"Global climate change continues to attract considerable public and scientific attention," Alpha said. "There is concern in particular about the emissions of GHGs [or greenhouse gases], such as carbon dioxide and methane."

The company's document says, "Combustion of fossil fuels like coal and gas results in the creation of carbon dioxide, which is currently emitted into the atmosphere by coal and gas end users, such as coal-fired electric power generators. As a result, there have been and are expected to be numerous GHG emissions initiatives that could reduce the demand for coal."

During a March 2012 event, however, Alpha CEO Kevin Crutchfield cast doubt on the connection between fossil fuel consumption and climate change. He declared that EPA limits on power plant CO_2 emissions "would be hugely problematic," in part because of uncertainty about global warming, which 97 percent of climate scientists say is very likely caused by human activities.

"It does seem like something is going on," he said in response to a question about climate change, according to West Virginia's *Charleston Gazette*.

But he added that "the question that has to be asked is, 'Is mankind contributing to that?' I don't really know the answer to that."

An Alpha spokesman did not respond to a request for comment.

Companies' 'most material' risk

The SEC issued guidance in 2010 specifically requiring companies to disclose any physical impacts climate change may be having on their operations (***ClimateWire***, Jan. 28, 2010).

Environmentalists considered it a major win. But industry advocates -- both inside and outside the SEC -- said the science wasn't settled enough for the requirement, which some lawmakers tried to overturn.

U.S. coal companies have sought to satisfy these requirements by generally discussing climate change in their 10-Ks in terms of current or potential government scrutiny. But Peabody, Alpha and other majors like Cloud Peak

Energy Inc. and Arch Coal Inc. tend to steer clear of climate-related infrastructure issues posed by sea-level rise or the potential for increasingly severe natural disasters.
"It is possible that future international, federal and state initiatives to control GHG emissions could result in increased costs associated with coal production and consumption," Alliance Resource Partners LP said in one representative passage.

Such efforts could require Alliance's utility industry customers "to install additional controls to reduce carbon dioxide emissions or costs to purchase emissions reduction credits to comply with future emissions trading programs," the company said in its 10-K.

Bob Murray speaking to reporters in August 2007 near Huntington, Utah. Photo by Justin Sullivan courtesy of Getty Images.
Huber said the SEC requires companies to disclose material impacts related to climate change. "Much of it is judgment," she said, "of what a company believes is material."

Beyond physical impacts, Huber said companies must also report whether rules and regulations could hurt the bottom line. For U.S. coal companies, climate change regulations may indeed be "the most material item," she said.
A 2013 Congressional Research Service **report**, citing other studies -- including ones conducted by Ceres and Davis Polk -- said the new SEC guidance had not dramatically changed the reporting habits of many companies. It also suggested the SEC was not cracking down on those who didn't follow the guidelines.
The guidance, however, does not apply to Murray Energy Corp., which is also among the largest U.S. coal producers. The company's private ownership means it doesn't have to file annual disclosure reports with the SEC.
That has left CEO Robert Murray free to offer unrelenting criticism of the climate change science without ever having to show how or if his company is preparing for global warming.

"In the late 1980s, environmental alarmists and liberal politicians and elitists attempted to scare us with the terrible consequences of 'acid rain,'" Murray said during a speech last year. "Today, their platform is 'global warming.'"

Earning shareholder trust
Not all extraction companies focus on regulatory burdens when talking about global warming. International mining giant Rio Tinto PLC, for example, has long been outspoken about the impacts of climate change on its operations.
"We operate in a complex and interconnected world where global and local issues -- such as biodiversity, climate change, livelihoods, and regional economic development -- bring both risk and opportunity to the design, development and management of our operations," its most recent annual report told investors.
"Mining, smelting, refining and infrastructure installations are vulnerable to natural events including earthquakes, subsidence, drought, flood, fire, storm and

climate change," the report says.

Huber, the corporate-compliance attorney, said companies with a strong European presence tend to be more vocal about potential physical climate change impacts, responding to investor wishes. "As compared to U.S. companies, it is more important to them, and they are more conscious about it," she said, "and the reporting tends to be more fulsome and varied."
Coal companies could better earn shareholders' trust, said Ceres' Coburn, by being more candid about the risk climate change poses to their businesses, not just associated with regulations.

That was the main message Ceres and a group of 70 global investors managing more than $3 trillion of collective assets delivered to 45 fossil fuel-dependent corporations almost two years ago (***ClimateWire***, Oct. 25, 2013).
While companies have a right to vocally oppose regulations they believe could harm shareholders, they shouldn't do so by spreading misinformation, said Gretchen Goldman, lead analyst at the Center for Science and Democracy, a Union of Concerned Scientists project.
"They do not have a right to misrepresent scientific facts," Goldman said. "This is an issue that has seen a tremendous amount of misinformation, and so for them to be spreading that misinformation or otherwise supporting misrepresentations of climate science is immoral and not appropriate."
Twitter: **@corbinhiar** | Email: **chiar@eenews.net**

[redacted]

From: Larry Shapiro <lshapiro@rffund.org>
Sent: Tuesday, December 15, 2015 1:20 PM
To: Lemuel Srolovic
Cc: Lee Wasserman; 'Lisa Hamilton (lisa_a_hamilton@yahoo.com)'
Subject: E&E: After N.Y. legal deal, Peabody ignores climate change in SEC filing

Hi Lem,

You probably saw this, but if not, fyi.

After N.Y. legal deal, Peabody ignores climate change in SEC filing

Benjamin Hulac, E&E reporter
Published: Tuesday, December 15, 2015

Peabody Energy Corp. announced plans yesterday to raise $1 billion from investors but did not mention climate change or emissions-cutting policies as investment risks. That exclusion came one month after Peabody finalized an agreement with New York's attorney general to file updated public documents about its financial hazards related to climate change and potential climate regulations.

In the **document** filed yesterday with the Securities and Exchange Commission, Peabody did not reference climate change, greenhouse gases, carbon emissions, global warming or any comparable terms or phrases.

The St. Louis-headquartered company, the largest publicly traded coal company in the world, listed competition from natural gas and renewable energy as risk factors to would-be investors, as well as "new environmental" regulations -- a general term that could apply to more than climate change.

The document also broadly warns investors that "legislation, regulations and court decisions or other government actions" could harm business. The word "environmental" appears once in the 229-page filing.

Announcing a resolution between his office and Peabody, New York Attorney General Eric Schneiderman (D) said Nov. 9 that Peabody misled the public and investors about how climate change and regulation to curb emissions could affect the company -- behavior that violated state laws.

The company, for example, predicted that "aggressive" regulations for existing power plants and electric generation in the United States could cut into its coal sales by 33 percent or more but kept that information private, according to the attorney general's office.

As part of the November **agreement**, Schneiderman said Peabody would file new SEC disclosures that "accurately and objectively represent" climate risks.

"Peabody has agreed that all future statements to shareholders and the public will be consistent with the terms of its agreement with the attorney general's office and the disclosures it will file with the SEC," Schneiderman's office said in November.

Company defends 'routine' document

Asked why the document detailing the sale of $1 billion in securities did not mention climate change and related financial risks, a Peabody spokesman issued the following response to*ClimateWire*: "The shelf statement is a routine filing and replaces a prior shelf statement that expired in October. It incorporates by reference other filings such as the latest quarterly 10Q." (A shelf statement is a financial technique that lets public companies offer securities "off the shelf" to investors.)

Schneiderman said the investigation that resulted in the recent resolution began in 2013.

That investigation found Peabody had been including an International Energy Agency forecast in its investor guidance favorable to coal demand, while omitting two other IEA scenarios that forecast a far bleaker future for global coal consumption.

That forecast was "based on an assumption that governments will fail to adopt any new policies or regulations to reduce the amount of climate change pollution."

In June 2007, when Gov. Andrew Cuomo (D) was state attorney general, his office subpoenaed Peabody for information about the firm's "disclosure to investors of risks associated with possible climate change and related legislation and regulations," according to Peabody.

"Concerns about the environmental impacts of coal combustion" and increased coal regulation, Peabody said Feb. 25, "could significantly affect demand for our products and securities."

Following the Paris climate accord reached during the weekend, Peabody shares finished the day down 13 percent at $7.66.

Larry Shapiro
Associate Director for Program Development
Rockefeller Family Fund
475 Riverside Drive, Suite 900
New York, NY 10115
[redacted]
Email: lshapiro@rffund.org

[redacted]

From: Lemuel Srolovic
Sent: Wednesday, December 16, 2015 8:49 AM
To: Larry Shapiro
Subject: Re: E&E: After N.Y. legal deal, Peabody ignores climate change in SEC filing

Larry -- I did indeed but thank you. Happy holidays! Lem.

Sent from my iPhone

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Associate Director for Program Development
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New York, NY 10115
[redacted]
Email: lshapiro@rffund.org

[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Tuesday, December 22, 2015 6:39 PM
To: Lemuel Srolovic
Subject: FYI

http://insideclimatenews.org/news/22122015/exxon-mobil-oil-industry-peers-knew-about-climate-change-dangers-1970s-american-petroleum-institute-api-shell-chevron-texaco

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

[redacted]

From: Lemuel Srolovic
Sent: Tuesday, December 22, 2015 9:40 PM
To: Lee Wasserman
Subject: Re: FYI

Thanks, Lee.

Happy holidays!

Sent from my iPhone

On Dec 22, 2015, at 6:39 PM, Lee Wasserman <lwasserman@rffund.org> wrote:

> http://insideclimatenews.org/news/22122015/exxon-mobil-oil-industry-peers-knew-about-climate-change-dangers-1970s-american-petroleum-institute-api-shell-chevron-texaco
>
> Lee Wasserman
> Director
> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]
> <9FFC3469-8ADD-4D30-A674-692287935301[189].png>

[redacted]

From: Lee Wasserman <lwasserman@rffund.org>
Sent: Wednesday, December 23, 2015 12:37 AM
To: Lemuel Srolovic
Subject: Re: FYI

Same to you Lem. Hope you get some time off.

Lee Wasserman
Director
475 Riverside Drive, Suite 900 | New York, NY 10115
[redacted]
ROCKEFELLER FAMILY FUND

From: Lemuel Srolovic <Lemuel.Srolovic@ag.ny.gov>
Date: Tuesday, December 22, 2015 at 9:40 PM
To: Lee Wasserman <lwasserman@rffund.org>
Subject: Re: FYI

Thanks, Lee.

Happy holidays!

Sent from my iPhone

On Dec 22, 2015, at 6:39 PM, Lee Wasserman <lwasserman@rffund.org> wrote:

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> 475 Riverside Drive, Suite 900 | New York, NY 10115
> [redacted]
> <9FFC3469-8ADD-4D30-A674-692287935301[189].png>

[redacted]

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:52 AM
To: Lee Wasserman
Subject: Re: One more

Thanks, Lee.

Happy new year and all the best in 2016.

Sent from my iPhone

> On Dec 31, 2015, at 6:46 AM, Lee Wasserman <lwasserman@rffund.org> wrote:
>
> Before year's end.
> http://graphics.latimes.com/oil-operations/
>
> Happy New Year
>
> Lee Wasserman
> Rockefeller Family Fund

[redacted]

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM
To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
Subject: Fwd: One more

Latest from LA Times.

Sent from my iPhone

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** December 31, 2015 at 6:46:12 AM EST
> **To:** Lemuel Srolovic <Lemuel.Srolovic@ag.ny.gov>
> **Subject: One more**
>
> Before year's end.
> http://graphics.latimes.com/oil-operations/
>
> Happy New Year
>
> Lee Wasserman
> Rockefeller Family Fund

[redacted]

From: Philip Bein
Sent: Thursday, December 31, 2015 9:09 AM
To: Lemuel Srolovic
Subject: RE: One more

Lem, I had called earlier in the week to talk about Peabody. Are you working today?

Philip Bein
Watershed Inspector General
New York State Attorney General's Office
The Capitol
Albany, New York 12224
[redacted]

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM
To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
Subject: Fwd: One more

Latest from LA Times.

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> Happy New Year
>
> Lee Wasserman
> Rockefeller Family Fund

[redacted]

From: Alan Belensz
Sent: Thursday, December 31, 2015 9:26 AM
To: Lemuel Srolovic; Monica Wagner; Mandy DeRoche; Philip Bein; Laura Heslin; Kevin Olson
Subject: RE: One more

Wow, much here to digest.

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM
To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
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[redacted]

From: Lemuel Srolovic
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Subject: Re: One more

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Sent from my iPhone

On Dec 31, 2015, at 9:09 AM, Philip Bein <Philip.Bein@ag.ny.gov> wrote:

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> New York State Attorney General's Office
> The Capitol
> Albany, New York 12224
> [redacted]
>
> ---
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[redacted]

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Sent: Thursday, December 31, 2015 9:27 AM
To: Lemuel Srolovic
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fine

Philip Bein
Watershed Inspector General
New York State Attorney General's Office
The Capitol
Albany, New York 12224
[redacted]

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> **From:** Lemuel Srolovic
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Subject: One more

Before year's end.
http://graphics.latimes.com/oil-operations/

Happy New Year

Lee Wasserman
Rockefeller Family Fund

[redacted]

From: Monica Wagner
Sent: Thursday, December 31, 2015 10:01 AM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

It's jampacked. Have we heard of the Waves and Storms of the North Atlantic Group?

From: Alan Belensz
Sent: Thursday, December 31, 2015 9:26 AM
To: Lemuel Srolovic; Monica Wagner; Mandy DeRoche; Philip Bein; Laura Heslin; Kevin Olson
Subject: RE: One more

Wow, much here to digest.

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM
To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
Subject: Fwd: One more

Latest from LA Times.

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>
> Happy New Year
>
> Lee Wasserman
> Rockefeller Family Fund

[redacted]

From: Alan Belensz
Sent: Thursday, December 31, 2015 10:25 AM
To: Monica Wagner; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more
Attachments: WASA Waves and Storms Group.pdf

It appears the WASA Group consisted of a group of European researchers evaluating the potential for increased storminess in the North Atlantic. A 1998 paper listing the scientific researchers is attached.

From: Monica Wagner
Sent: Thursday, December 31, 2015 10:01 AM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

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Changing Waves and Storms in the Northeast Atlantic?

The WASA Group*

ABSTRACT

The European project WASA (Waves and Storms in the North Atlantic) has been set up to verify or disprove hypotheses of a worsening storm and wave climate in the northeast Atlantic and its adjacent seas in the present century. Its main conclusion is that the storm and wave climate in most of the northeast Atlantic and in the North Sea has undergone significant variations on timescales of decades; it has indeed roughened in recent decades, but the present intensity of the storm and wave climate seems to be comparable with that at the beginning of this century. Part of this variability is found to be related to the North Atlantic oscillation.

An analysis of a high-resolution climate change experiment, mimicking global warming due to increased greenhouse gas concentrations, results in a weak increase of storm activity and (extreme) wave heights in the Bay of Biscay and in the North Sea, while storm action and waves slightly decrease along the Norwegian coast and in most of the remaining North Atlantic area. A weak increase in storm surges in the southern and eastern part of the North Sea is expected. These projected anthropogenic changes at the time of CO_2 doubling fall well within the limits of variability observed in the past.

A major methodical obstacle for the assessment of changes in the intensity of storm and wave events are inhomogeneities in the observational record, both in terms of local observations and of analyzed products (such as weather maps), which usually produce an artificial increase of extreme winds. This occurs because older analyses were based on fewer observations and with more limited conceptual and numerical models of the dynamical processes than more recent analyses. Therefore the assessment of changes in storminess is based on local observations of air pressure and high-frequency variance at tide gauges. Data of this sort is available for 100 yr and sometimes more. The assessment of changes in the wave climate is achieved using a two-step procedure; first a state-of-the-art wave model is integrated with 40 yr of wind analysis; the results are assumed to be reasonably homogeneous in the area south of 70°N and east of 20°W; then a regression is built that relates monthly mean air pressure distributions to intramonthly percentiles of wave heights at selected locations with the help of the 40-yr simulated data; finally, observed monthly mean air pressure fields from the beginning of this century are fed into the regression model to derive best guesses of wave statistics throughout the century.

*The WASA Group:
J. C. Carretero, M. Gomez, I. Lozano, A. Ruiz de Elvira, and O. Serrano, Clima Maritimo, Madrid, Spain.
K. Iden and M. Reistad, Det Norske Meteorologiske Institutt, Bergen, Norway.
H. Reichardt, V. Kharin, M. Stolley, and H. von Storch, Max-Planck-Institut für Meteorologie, Hamburg, Germany.
H. Günther, A. Pfizenmayer, W. Rosenthal, and M. Stawarz, Institut für Gewässerphysik, GKSS, Geesthacht, Germany.
T. Schmith, E. Kaas, and T. Li, Danmarks Meteorologiske Institut, Copenhagen, Denmark.
H. Alexandersson, Sveriges Meteorologiska och Hydrologiska Institut, Norrköping, Sweden.
J. Beersma, E. Bouws, G. Komen, and K. Rider, Koninklijk Nederlands Meteorologisch Instituut, De Bilt, the Netherlands.
R. Flather and J. Smith, Proudman Oceanographic Laboratory, Bidston, United Kingdom.
W. Bijl and J. de Ronde, Rijkswaterstaat, the Netherlands.
M. Mietus, Institute of Meteorology and Water Management, Gdynia, Poland.
Eva Bauer, Potsdam Institut für Klimafolgenforschung, Potsdam, Germany.
H. Schmidt, Seewetteramt, Hamburg, Germany.
H. Langenberg, Institut für Meereskunde, Universität Hamburg, Hamburg, Germany.
Corresponding author address: Hans von Storch, Institute of Hydrophysics, GKSS Research Centre, P.O. Box 21502, Geesthacht, Germany.
E-mail: storch@gkss.de

In final form 13 January 1998.

1. Background

In the public debate concerning climate change due to increasing concentrations of radiatively active gases into the atmosphere, many people are concerned about the possibility of an intensification of extratropical storms. Even though the Intergovernmental Panel on Climate Change (IPCC) took a cautious stand in this matter because of lack of evidence (Houghton et al. 1990; Houghton et al. 1992; Houghton et al. 1996), a mixture of indirect evidence (van Hooff 1993; Hogben 1994) and misleading scientific statements (Schinke 1992) created a substantial uneasiness in the public (Berz 1992; Berz and Conrad 1994; Greenpeace 1994). The offshore oil industry in the North Sea was confronted with reports of extreme waves higher than had ever been observed. The insurance industry organized meetings with scientists because of greatly increased storm-related damages. Newspapers in northern Europe were full of speculations about the enhanced threat of extratropical storms in early 1993.

In this atmosphere the Norwegian Meteorological Institute organized two workshops, "Climate Trends and Future Offshore Design and Operation Criteria," in Reykjavik and Bergen, bringing together people from the oil industry, certification agencies, and scientists to discuss the reality of a worsening of the wave and storm climate. The workshops did not issue definite statements, but the general impression was that hard evidence for a worsening of the storm and wave climate was not available (for a summary see von Storch et al. 1994). A group of workshop participants then established the Waves and Storms in the North Atlantic (WASA) project.

In the present paper the results obtained in WASA are summarized and the main conclusions are drawn. The results are documented in detail in a series of papers (Alexandersson et al. 1998; Bauer et al. 1996; Beersma et al. 1997; Bijl 1997; Kaas et al. 1996; Rider et al. 1996; Schmith 1995; Schmith et al. 1997; Schmith et al. 1998; Günther et al. 1998; Schmidt and von Storch 1993; von Storch and Reichardt 1997; Bouws et al. 1996). Preliminary assessments were published by von Storch et al. (1994) and WASA (1994, 1995). Part of the work reported here also originates from studies outside of WASA.

The present paper is organized as follows. In section 2 the fundamental methodological problem of WASA is addressed, namely, the presence of creeping inhomogeneities. These inhomogeneities render the seemingly most suitable collections of weather maps useless for the description of trends and interdecadal variability in storm and storm-related statistics. Instead local data, unaffected by improving analysis procedures, are studied. Two variables seem to be little affected by instrumental and environmental changes, namely, air pressure and sea level variations around a multiyear mean. We present time series of intrayearly statistics of geostrophic winds, air pressure tendencies, and variances of storm-related water level variations in section 3.

In the case of the wave climate, analyses, such as ship routing maps derived manually from wind analyses, suffer to an unknown degree from inhomogeneities. Local observations are sparse and have achieved a high level of high and uniform accuracy only in the past 10 years or so. Prior to, say, 1980, the observational techniques have changed from visual assessment to shipborn instruments, which in their early days covered only part of the energy spectrum (and thus underestimated the significant wave height, which is proportional to the integral over the energy spectrum). Thus, in the WASA project a strategy suggested by Kushnir et al. (1995) and Kushnir et al. (1997) was adopted, namely, of first generating a consistent dataset describing the variations of the wave field for 40 yr with a state-of-the-art wave model and multiyear wind analyses. The simulated wave data in areas where the wind forcing is thought to be sufficiently homogeneous is considered as "substitute reality." In section 4 the model simulation and the results obtained within the 40 yr of simulation in the "homogeneity" area (around the British Isles, the Bay of Biscay, and the North Sea) are presented. In section 5 the substitute reality wave statistics are linked to monthly mean air pressure analyses, which have been collected since 1899 and are thought to be sufficiently homogeneous (Trenberth and Paolino 1980). This is done for two locations in the northern and central North Sea (oil fields Ekofisk and Brent). With the help of this regression model and the observed monthly mean air pressure fields, a best guess of wave statistics earlier in this century is derived.

In section 6 possible implications of an increased CO_2 concentrations in the atmosphere on storminess, wave, and storm surge statistics are examined. Specifically, a high-resolution (T106) paired atmospheric GCM time-slice experiment on the impact of doubled CO_2 concentrations in the atmosphere is studied. The simulated change in storminess is discussed, and the impact of this (moderate) change in storminess on waves and storm surge statistics, as estimated through dynamical wave and storm surge models as well as through the regression model derived in section 5, are presented.

In the concluding section, the main results are summarized and the major caveats of the analysis are listed and discussed.

2. The problem of homogeneity

a. General

The methodological challenge with the analysis of historical datasets is the discrimination between signals, reflecting real changes as opposed to changes due to changing instrumental accuracies, environmental conditions, observational practices, and analysis routines. We call a dataset homogeneous if it is free of such artificial contaminations. Inhomogeneities, that is, changing nonphysical factors influencing the weather analyses, can be characterized as being either creeping or sudden (Karl et al. 1993; Jones 1995).

Creeping inhomogeneities are present in operational analyses, which are prepared with operational weather forecast schemes subject to ongoing improvements of the numerical weather prediction model. Another source of creeping inhomogeneities consists of ongoing modifications in the observational network, be they changes in the density of stations or the replacement of instruments. For instance, the availability of satellite imagery and reports from intercontinental flights in the 1960s may have persuaded human weather analysts and forecasters to describe a low pressure system over the Atlantic as being more intense than when they had only ship observations as was the case in the 1950s. The number of forecasters that wholeheartedly accepted this additional information may have gradually increased as more conservative forecasters retired and were replaced by younger colleagues. In marine weather statistics, based on reports from voluntary observing ships, creeping inhomogeneities are brought into the analysis procedure by gradually changing ship routing routines and by increasing ship speeds and heights and other aspects. The standard technique for identifying such creeping inhomogeneities is to compare the suspected time series with data from neighboring stations known not to be affected by the inhomogeneity (Alexandersson 1986; Alexandersson and Moberg 1997). However, such neighboring stations are not always available, particularly in marine weather data.

Sudden inhomogeneities are introduced by abrupt, often documented, changes in the analysis scheme. Such changes may include the change from manual to automatic analysis techniques, the rectification of outright errors in the analysis procedure, or the creation or the withdrawal of an observational platform in a data-sparse area (such as ocean weather stations). If sudden changes are not already known from the documentation, they may often be identified by screening the time series for jumps in the moments of the time series calculated for moving windows.

b. Storm climate

When assessing the temporal evolution of the storm climate, principly two different types of data may be considered. One source of information is the archive of weather maps, which covers about 100 years. Indeed, several attempts have been made to count the number of storms, stratified after the minimum core pressure, in the course of time (Schinke 1992; Stein and Hense 1994). These studies are useful in describing the year-to-year fluctuations for a period of, say, 10 years. However, for a longer perspective this approach is rendered inconclusive simply because the quality of weather maps has steadily improved. Thus any steady worsening of the storm climate apparent in the weather maps (as reported by Schinke 1992) might reflect a real signal or might result from the ever-increasing quality of the operational analyses due to more and better observations, more powerful diagnostic tools, and other improvements in the monitoring of the state of the troposphere. A more detailed mapping of the pressure distribution, however, automatically yields deeper lows. This problem is severe for weather maps; when dealing with monthly mean maps, the inhomogeneity becomes less significant because of the greater smoothness of monthly mean fields.

The inhomogeneity problem is illustrated by Fig. 1, in which the ratio of high-pass filtered standard deviations of air pressure variations in winter in the decade 1984–93 and in the 9-yr interval 1955–63, as derived from the Norwegian Meteorological Institute (DNMI) analyses (see section 5), is plotted. Variability obviously increased since the 1950s in areas where few or no in situ observations are routinely available; this increase is likely to be spurious. Note the local maximum of enhanced variability, with a ratio > 1.1, in the data-sparse area between Svalbard and Greenland and over Greenland. Of course, this increase may be real, but it is suspicious that it takes place in areas of little

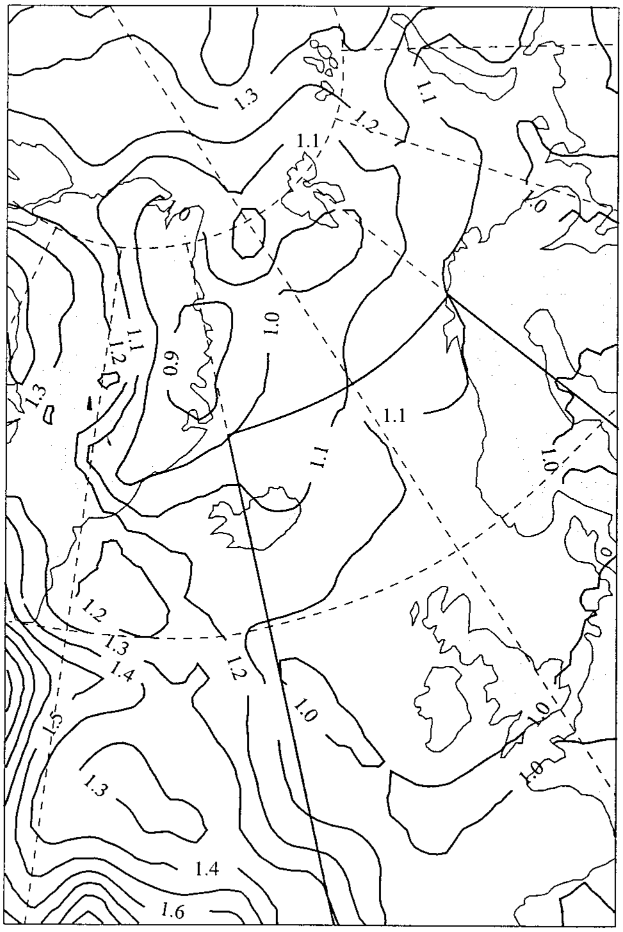

FIG. 1. Ratio of synoptic-scale standard deviation of air pressure variations in winter (DJF) as derived from DNMI analyses in the decade 1984–93 and in the decade 1955–63. The analyses in the marked area south of 70°N and east of 20°W seem to be relatively homogeneous.

high quality observational data. Note that the comparison with observed records is often inconclusive as these data have entered the analysis, so that they do not offer independent information about the success of the analysis for providing useful information in data-void areas and time intervals. Furthermore, the local "observations," which are sometimes not instrumental observations but reports based on subjective assessments (wind force estimated from wave heights), may already suffer from the creeping inhomogeneities (cf. Peterson and Hasse 1987), which are then inherited by the 2D mapped analysis.

Any analysis of changes of the storm climate should be supported by an analysis of local observations that are unaffected by improvements in the process of mapping the weather. A good parameter would be wind speed, since it relates directly to damages and impact of waves and surges. However, wind observations—either determined instrumentally or estimated—are usually of limited value due to inhomogeneities such as the change of scale, change of observer, change of surroundings, etc. (cf. Peterson and Hasse 1987).

Therefore one must look for other and more homogeneous proxies for storminess. An obvious choice is to base these on station air pressure, the time series of which are considered to be rather homogeneous because more or less the same instrument (mercury barometer) and procedures have been used throughout the entire observation period.

From air pressure several proxies for storminess may be formed, namely, the annual (seasonal, monthly) distribution of the geostrophic wind speed derived from three stations in a triangle (Schmidt and von Storch 1993; see section 3a) or the annual (seasonal, monthly) distribution of the pressure minima or tendencies, possibly after suppressing the nonsynoptic variations by means of a digital filter (Schmith 1995; Kaas et al. 1996) (see section 3b). Also the frequencies of "pressure events," such as pressure readings below a threshold, geostrophic winds, or pressure changes larger than a threshold, may serve as a measure of storminess.

Alexandersson et al. (1998) compared the different measures for the geostrophic wind triangle "Bergen–Stockholm–Nordby" (for the locations, see Fig. 2) and for the station Oksøy in the middle of the triangle. Using data from 1881 to 1995, Alexandersson et al. (1998) calculated correlations between annual 99% and 95% percentiles of geostrophic winds (labeled p% in the following table), the frequency of geostrophic winds above 25 m s^{-1} (F_{25}) and of the frequency of 24-h pressure tendencies ($|\Delta_p| > 16$ hPa) and of deep pressure readings ($p < 980$) at Oksøy.

	95%	F_{25}	$\lvert\Delta_p\rvert$	$p < 980$
99%	0.75	0.90	0.38	0.08
95%		0.64	0.44	0.15
F_{25}			0.34	0.07
$\lvert\Delta_p\rvert$				0.35

The indices related to pressure gradients (99%, 95%, and F_{25}) are well correlated, whereas the frequency of deep pressure readings ($p < 980$) is only loosely linked, which may in part be due to the fact that the large-scale low-frequency variability of air pressure shifts local pressure distributions to smaller or larger values without necessarily affecting the storm regime. This finding casts additional doubts on the approach of counting "deep cyclones," as a deep core pressure is not necessarily connected with a strong spatial or temporal gradient.

Another homogeneous proxy data time series is provided by high-frequency sea level variations at a tide gauge. The variance of such variations is controlled by the variance of the synoptic atmospheric disturbances (see section 3c).

The proxy data geostrophic wind, high-frequency pressure tendency, and sea level variations cannot be used to reliably estimate actual wind speeds; however, changes in the annual (monthly) distributions of the wind speed are well reflected with similar changes in the distributions of geostrophic wind speed. This is demonstrated in Fig. 3 by a percentile–percentile plot of 5 yr of daily wind speeds (observed at a station) and daily geostrophic wind speeds (derived with the triangle method using three surrounding pressure readings). Thus changes of statistical moments and percentiles of the wind speed distribution may be deduced from changes of the same statistical moments of the geostrophic wind speed distribution.

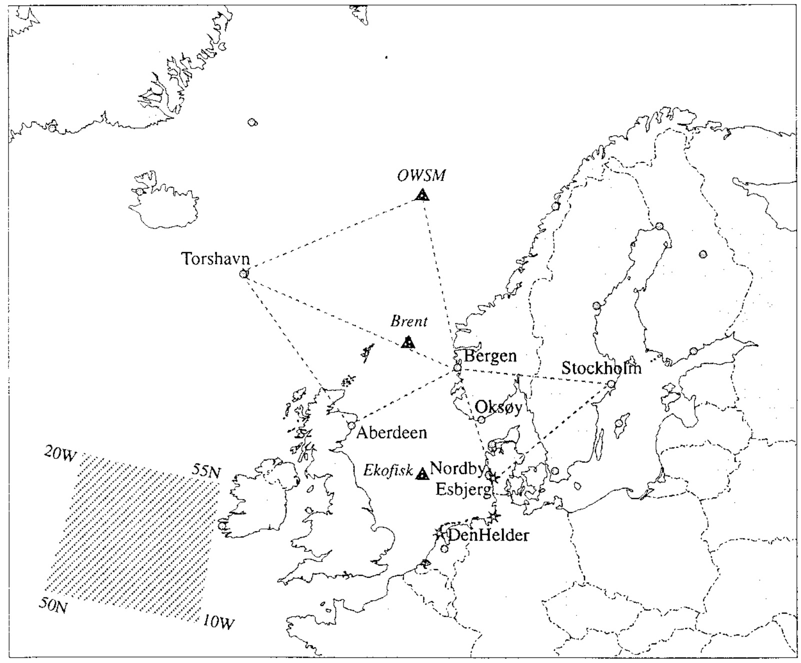

FIG. 2. Location of in situ data used in the WASA studies. Locations explicitly used in the present paper are marked by their names. Dots represent pressure gauges used for geostrophic wind calculations by Alexandersson et al. (1998). Triangles: Tide gauges for which high water level percentiles were calculated, and offshore stations and ocean weather stations. Geostrophic triangles used in the present article are marked by dotted lines; the wave chart area west of Ireland is marked by hatching.

c. *Wave climate*

Data about wave height are available from reports of visual assessments from ships of opportunity and lighthouses, from wave rider buoys and shipborne wave recorders at ocean weather stations; also wave height maps have been constructed for the purpose of ship routing from wind analyses. These data are sparse and suffer from inhomogeneities of various kinds (cf. WASA 1994). Analyses of these data have revealed a substantial worsening of the wave climate in the North Atlantic (Neu 1984; Carter and Draper 1988; Bacon and Carter 1991; Hogben 1994; Bouws et al. 1996).

A recent estimate is offered by Bouws et al. (1996), who studied operational analysis of wave analysis prepared by the Koninklijk Nederlands Meteorologisch Instituut (KNMI) Ship Routing Office from 1961 to 1987. The procedure for preparing the analyses did not change in the course of time, but the data used as base material for the analyses did change. Thus, the KNMI wave charts suffer from similar hidden inhomogeneities as the DNMI pressure analyses. Thus, any trend derived from the KNMI wave charts should be considered as an upper bound and not as an unbiased best guess.

For a box west off Ireland, in 50°–55°N, 20°–10°W, maximum wave heights were read from the wave charts (1961–87) and annual percentiles (labeled 99% and 90% in the following table) as well as the annual maximum (max) were determined. From these annual time series, the mean heights and mean annual changes were calculated.

	Max	**99%**	**90%**
Time mean (m)	11.1	8.7	5.8
Change 1961–87			
cm yr^{-1}	3.8	2.7	3.8
% yr^{-1}	0.3	0.3	0.7

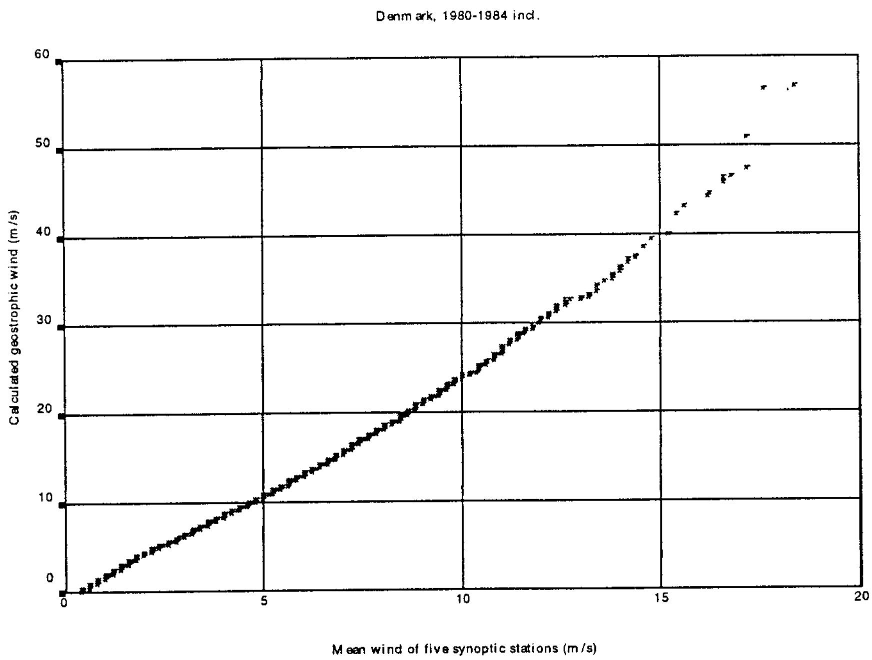

FIG. 3. Percentile–percentile plot of station wind speed and geostrophic wind speed for a Danish station, derived from 5 yr of daily data.

These numbers show changes considerably smaller than those given by others, such as Neu (1984), Bacon and Carter (1991), who report increases of the order of more than 1% yr^{-1}. We will later see in section 4b that the WASA reconstructions return even smaller trends in that area.

Using a downscaling approach, Kushnir et al. (1995) and Kushnir et al. (1997) built an empirical model relating wave hindcast data, generated with 10 yr of European Centre for Medium-Range Weather Forecasts (ECMWF) analyses of surface winds, with the mean air pressure field. This statistical model was then used to estimate the mean wave field from the air pressure field from 1962 onward. This procedure confirmed the presence of an increase in wave heights during the past few decades as inferred from the observational data. In the present paper a similar approach is pursued.

3. Analysis of the historical storm climate

In the next sections we deal in some detail with time series of intraannual percentiles and pressure tendencies. In the last subsection, we discuss two time series derived from tide gauges at the southern and eastern North Sea coast.

a. *Geostrophic wind analyses*

For 20 stations (see dots in Fig. 2) situated in northwestern Europe and the northeast Atlantic, the WASA project identified an uninterrupted pressure record of three or four daily observations for about the last 100 yr that could be homogenized. (The influence of changing instruments and gradually changing environments are less severe in case of air pressure measurements, but there are several other sources of potential inhomogeneities, such as relocations with a vertical displacement of the instrument or changing observational times.)

For these stations, triangles were set up and daily geostrophic winds were derived. Time series of annual 95% and 99% quantiles for various triangles are presented by Alexandersson et al. (1998) and for a triangle in the German Bight by Schmidt and von Storch (1993). They all exhibit marked interdecadal variability, with an intensification in the past decades. The findings are summarized by Figs. 4 and 5, which show standardized annual quantiles time series for triangles in the Scandinavian–Finland Baltic Sea region (Fig. 4) and in the British Isles–North Sea–Norwegian Sea region (Fig. 5). The quantiles are standardized; that is, for each triangle and each percentile, first the long-term mean and the standard deviation are determined, then the mean is subtracted and the time series is divided by the standard deviation.

There has indeed been an increase in the strong geostrophic wind speeds in the past decades, but this increase does not appear to be alarming when compared with conditions earlier in this century and at the end of the last century. There is a considerable amount of interdecadal variability, and an assessment using only data from 1960 onward leads to misleading result of dramatic increases.

Note that the interdecadal variability in the two considered quantiles are very similar, indicating that the annual geostrophic wind speed distribution is not becoming broader or narrower but is shifting as a whole to smaller or larger values.

Mietus (1995) examined annual mean geostrophic wind speeds derived from the triangle "Jan Mayen–

Svalbard–Bjørnøya" in the northernmost North Atlantic and likewise found an upward trend from 1960 onward, with a magnitude of 2 (cm s^{-1}) yr.

An important factor characteristic for the large-scale state of the atmospheric circulation in the North Atlantic area is the North Atlantic oscillation (NAO) (van Loon and Rogers 1978; Hurrell 1995), so that it appears plausible that the identified variations in storm frequency may be related to variations in the NAO. This is really the case, but the correlations are not large although statistically significant: For the 95 and 99 percentiles in Fig. 4 the correlations are only 0.49 and 0.37 only and, similarly, for Fig. 5, only 0.56 and 0.38.

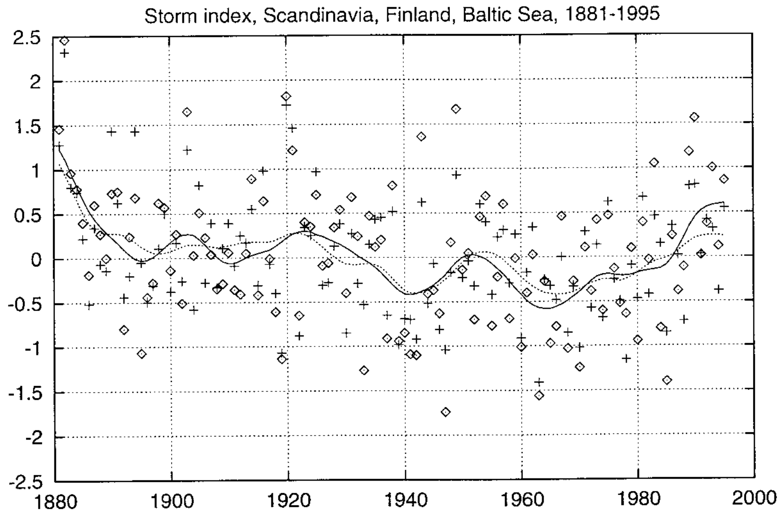

FIG. 4. Standardized annual 95% (diamonds and full line) and 99% (crosses and dotted line) quantile time series from pressure triangles in the Scandinavian, Finnish, and Baltic Sea regions. The lines are obtained from the yearly data by applying a Gaussian filter with standard deviation of 3 yr. Dimensionless units. (From Alexandersson et al. 1998.)

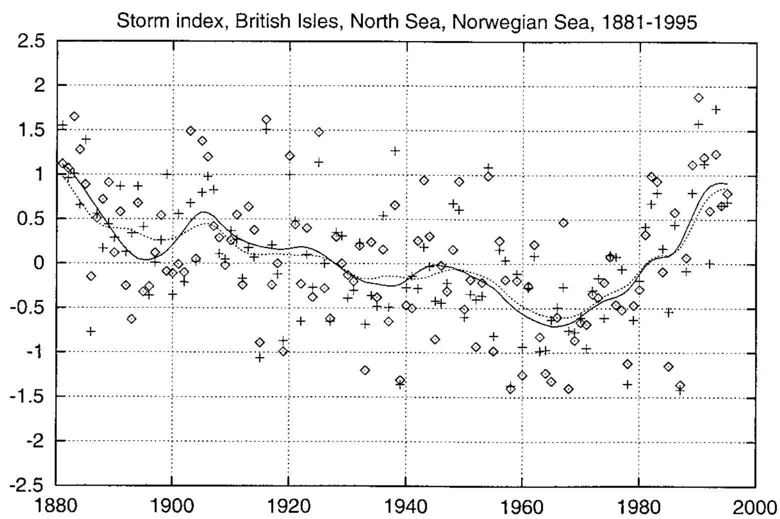

FIG. 5. Standardized annual 95% (diamonds and full line) and 99% (crosses and dotted line) quantile time series from pressure triangles in the British Isle, North Sea, and Norwegian Sea regions. The lines are obtained from the yearly data by applying a Gaussian filter with standard deviation of 3 yr. Dimensionless units. (From Alexandersson et al. 1998.)

b. Pressure tendency analysis

Kaas et al. (1996) calculated 12-h absolute pressure tendencies for eight North Atlantic–Scandinavian stations for the period 1961–87. By means of a downscaling technique utilizing canonical correlation, the monthly mean (winter months only) of these absolute pressure tendencies for each station were related to North Atlantic monthly mean. The relations found were used to hindcast the time series of monthly means of absolute pressure tendency for the period 1903–87. For two of the stations the pressure tendencies could be calculated directly from observations so a direct comparison between observed/hindcasted values was possible. The result of this exercise is shown in Fig. 6 with a low-frequency appearance similar to that found for the geostrophic wind speed curves in Fig. 5.

The method was developed further in Schmith et al. (1998). However, the scope was somewhat different: namely, to investigate in detail the hypothesis that high-frequency variability and low-frequency variability of the mean sea level pressure are closely interlinked.

For eight stations in the North Atlantic (Schmith et al. 1997) 24-h tendencies were calculated, and for each winter during the period 1875–1995 50%, 10%, and 1% exceedance levels were calculated. The time series of these levels showed no dramatic behavior at any of the stations, although there was some increase during the past two decades. A similar downscaling to that in Kaas et al. (1996) was carried out but for the period 1900–95 and with canonical correlation analysis replaced by multilinear regression analysis. It was found that the exceedance levels were linked to the winter mean sea level pressure, with highest correlation coefficients for stations close to the North Atlantic storm track.

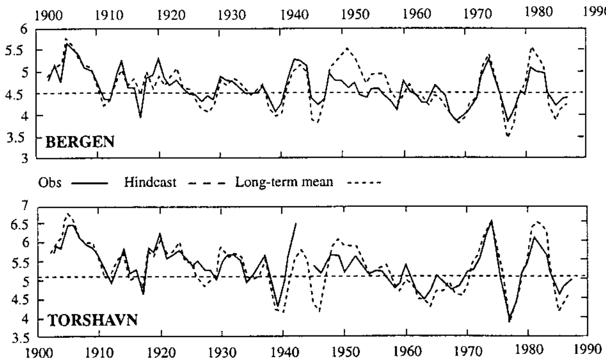

FIG. 6. Monthly mean of absolute values of pressure tendencies for Bergen and Thorshavn (see Fig. 2). Means derived from in situ data are given as a continuous line, and means derived indirectly via downscaling by the dashed lines. (From Kaas et al. 1996.)

The residual, that is, the signal not explained by the model, was also investigated. If the residual time series has a systematic trend, it would be a sign of changing physics not incorporated into the model, for instance systematic change in sea surface temperatures leading to decreased stability of the atmosphere and therefore increased baroclinic activity. The residual time series was found to be without any trend, indicating that no factors are missing in the model.

c. Storm-related sea level variations

The idea of using high-frequency variations of sea level as a proxy for storm activity was suggested by de Ronde (cf. von Storch et al. 1994). To do this, the annual mean water level is subtracted from the data, because changes in the mean water level are thought to reflect processes unrelated to the storm activity, such as local anthropogenic activity (e.g., harbor dredging), mean sea level rise, or land sinking. After subtraction of the annual mean, intraannual distributions of the water level variations are formed, as in the case of geostrophic winds discussed above, and intraannual quantiles are determined.

By now, the observational record at a series of tide gauges around the North Sea coast has been examined (Langenberg et al. 1997). At Cuxhaven (von Storch and Reichardt 1997), as well as at other locations, increases of the storm-related intraannual quantiles in the past decades were found, but the water levels vary still in a range comparable to historical levels. As examples, we present the time series for Den Helder (the Netherlands) and Esbjerg (Denmark) in Fig. 7. The Den Helder record is inhomogeneous because of the building of the the Ijsselmeer dam in the 1930s in the vicinity of the tide gauge (a rough correction was applied to the data).

4. Generating a "substitute reality" for wave statistics

As discussed above, an analysis of reported wave observations is of limited value because of the inhomogeneities hidden in such datasets. Therefore, an attempt was made to reconstruct the time–space statistics of the wave field with the help of a wave model integrated over 40 yr using a sequence of 6-h wind analysis. A detailed account of this simulation is offered by Günther et al. (1998).

With a homogeneous, realistic wind dataset we can expect, within the bounds of the skill of the wave model, to receive a detailed space–time evolution of wave parameters, such as significant wave height, which may be considered a substitute reality (see, for instance, Bauer et al. 1996). Even if the hindcasted substitute reality does not capture all details of the past wave history, we can expect that low-frequency variations in the wave statistics, including the interdecadal variability and trends, are reliably reproduced. Indeed, this assumption is found to be valid in the present analysis, when extended time series of in situ observed significant wave height statistics are compared with hindcasted wave heights in areas and time intervals with approximately homogeneous wind field analyses (Günther et al. 1998).

a. Wave model and forcing data

In the following we describe some technical details of the wave hindcast 1955–94. For details refer to Günther et al. (1998).

In the hindcast the fourth-generation wave model WAM (Komen et al. 1994) was used. It was run twice for the whole simulation interval 1955–94. First a "coarse-resolution" northern North Atlantic version (1.5° lat × long resolution, 9.5°–80°N, 78°W–48°E) was integrated using the operational wind analysis by the Fleet Numerical Operational Center (FNOC). The purpose of this simulation is to generate adequate time-dependent lateral boundary conditions for the "fine-resolution wind" run. (The results of the coarse simulation are of only limited use for the assessments of changes of the tall wave statistics in European coastal waters. The wind analyses exhibit some inhomogeneities, in particular in 1972 when the operation system was changed from manual analysis to numerical analysis. Also, the spatial resolution in the near-coastal areas of northern Europe is insufficient. Therefore, the results of this coarse run are not further considered.)

The hindcast itself is done on a "high-resolution" grid, covering the northeast Atlantic (0.5° lat × 0.75° long, 38°–77°N, 30°W–45°E) for 1955–94, using the operational air pressure analysis of the DNMI. From the air pressure field, surface winds were derived and used as forcing in the wave hindcast.

The DNMI analyses were prepared four times a day from 1955 until present. The pressure fields for the years 1955–81 were obtained by a numerical reanalysis on a 75-km grid using available pressure observations from ships and land stations. For the years 1955–79 the first-guess fields in the analysis were pressure fields digitized from manually analyzed weather maps on a 150-km grid, and for 1980–81 the first-guess fields came from operational analyses in a numerical weather prediction model system. From 1982 the pressure data were taken from operational analyses without any reanalysis. From January 1982 to May 1987 the pressure data were obtained from the global model at ECMWF, and those for June 1987–1995 from DNMI's regional weather prediction model.

The degree of contamination of the DNMI analyses by creeping inhomogeneities is examined with the help of maps of the ratio of storm-related standard deviations of air pressure calculated for consecutive 10-yr intervals. It is found that this standard deviation has undergone a steady increase in data-sparse areas far off the coasts, while remaining almost constant in an area surrounding the British Isles and covering the Norwegian Sea, the North Sea, and the Bay of Biscay (cf. Fig. 1). Based on this observation, we conclude that the DNMI analyses suffer from an artificial worsening of the storm climate in data-sparse areas.

In the area marked in Fig. 1, between 70° and 50°N and east of 20°W, the bias seems to be less severe. For this area slightly more storms were found in the decade 1984–93 than in the previous decades (348 as opposed to 339, 336, and 330). We do not know to what extent changes in the analysis scheme are responsible for the changing storm numbers in that area; therefore the result of this storm count should be taken as an upper bound of an increase of storm frequency and intensity.

To further examine the degree of inhomogeneities, we calculated time series of annual percentiles of geostrophic wind speeds derived from triangles, formed by in situ pressure gauges, and in the DNMI analy-

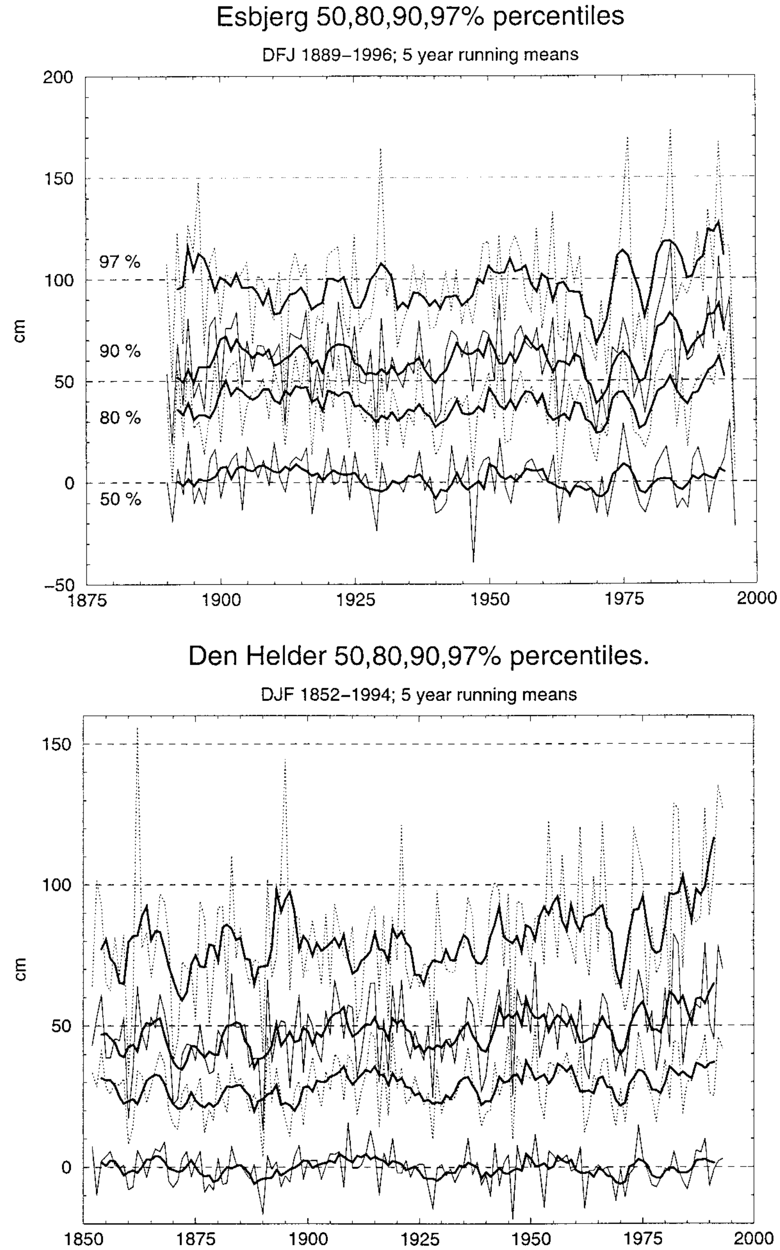

FIG. 7. Time series of the intraannual quantiles of storm-related water level variations (defined as deviation from the annual mean) at the gauges in Den Helder and Esbjerg (see triangles in Fig. 2). Units: cm.

ses. Figure 8 displays the result for the 90% quantiles for neighboring triangles. In case of the triangle “Thorshavn–OWS M–Bergen,” no systematic differences between the two time series emerge, but in the case of the southern triangle “Bergen–Thorshavn–Aberdeen,” the analysis exhibits a trend toward stronger winds that is absent in the in situ data. (The intercomparison between geostrophic winds derived from in situ observations with those calculated from the DNMI winds has only limited power in detecting inhomogeneities, as most of the surface pressure data available for geostrophic triangle wind calculations have entered the DNMI pressure analysis. In the present case, it may be that Aberdeen was not used for the DNMI analyses, while the other sites, Thorshavn, Bergen, and Ocean Weather Station M, were used.) Note that the trend in both triangles

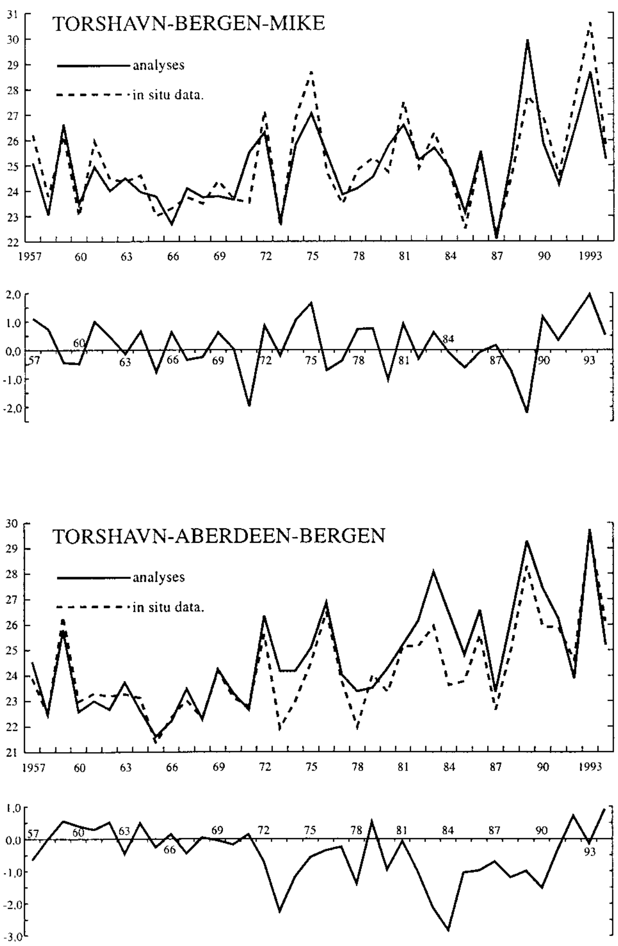

FIG. 8. Time series of annual 90% percentiles of geostrophic wind speeds derived from in situ data (top: Thorshavn–Ocean Weather Station M–Bergen; bottom: Thorshavn–Aberdeen–Bergen) and from the operational DNMI analyses. In the lower panels, the difference between the two curves in the upper panels in given. Units: m s^{-1}.

amount for about (2.5 m s^{-1}) (38 yr^{-1}), that is, ≈ 0.06 m s^{-1} yr^{-1}.

We conclude that the DNMI data to some extent describe an artificial worsening of the storm climate, not only in data-sparse areas but also over the North Sea; in particular, the analyses changed in 1982 and this seems to have introduced an inhomogeneity. This artificial worsening of the wind climate will, of course, be immediately transferred to the wave hindcast, so that all trends toward taller waves in the hindcast should be considered as upper bounds of any real upward trends.

b. Analysis of wave hindcast 1955–95: Selected locations

In Figs. 9 and 10 time series of annual maxima, means, and 99% and 90% December–January–February (DJF) quantities of local wind speeds and significant wave heights are shown for three selected locations: between Scotland and Norway (oil field Brent; 61°N, 1°E; for the locations, see Fig. 2), in the central North Sea (oil field Ekofisk; 56°N, 3°E, and in the Norwegian Sea (Ocean Weather Station M). In all three locations, there are upward (December–February, DJF) trends in the local winds and in the significant wave heights (in centimeters per second per year and centimeters per year).

Statistic	**OWS M**	**Brent**	**Ekofisk**
WIND SPEED			
Maximum	2.8	3.7	2.5
99%	5.3	3.4	4.6
90%	2.4	3.0	4.0
Mean	0.8	3.1	2.9
WAVE HEIGHT			
Maximum	7.7	4.3	1.9
99%	4.3	2.9	1.9
90%	0.9	0.6	1.1
Mean	1.1	1.0	0.6

A characteristic of these numbers is that the distributions have become wider in the past four decades.

The general increase in strong wind speeds is consistent with the increase in wind speed found for the triangles Thorshavn–Bergen–OWS M and Thorshavn–Bergen–Aberdeen (see Fig. 8), but the increase in geostrophic wind speed percentiles is much larger. This is due to the difference between wind speed and geostrophic wind speed.

The largest increases are found for the maxima of both the wind speeds and the wave heights. At Ocean Weather Station M the changes, derived from the ongoing in situ wind–wave observations, the hindcast compares well (Günther et al. 1998). For the mean wave height increases are 0.1–0.2 m during the 40 yr of hindcast, relative to mean heights on the order of 2–3 m; the signal is stronger for the maxima, for which accumulated increases of 1.30–3.30 m are simulated (on the background of 10–14-m averages).

Also, the temporal evolution of wave heights in the area west off Ireland considered by Bouws et al. (1996) was analyzed. The simulated increases, if any, are much smaller than those derived from the ship routing wave charts.

The trends are very sensitive to the time interval considered. The following table lists trends for the time interval 1961–87 (on the same time interval the ship routing map analysis discussed in section 2c was done) and for the full hindcast time interval 1955–94.

	Max	**99%**	**90%**
1961–87			
Time mean (m)	17.4	13.0	8.4
Change (cm yr^{-1})	5.5	1.0	0.5
(% yr^{-1})	0.3	0.1	0.1
1955–94			
Time mean (m)	17.3	12.9	8.3
Change (cm yr^{-1})	2.2	–1.5	–0.4
(% yr^{-1})	0.1	–0.1	0.0

The difference between the changes of the annual maxima (max) and of the annual percentiles (99% and 90%) between the wave charts (section 2c) and the WAM reconstruction is remarkable. The wave charts indicate an annual increase of 2.7 cm yr^{-1} for the 99% percentiles, whereas the hindcast simulates for the same time interval an increase of only 1 cm yr^{-1}, which becomes a decrease if the trend is calculated over the full 40 yr. These peculiar observations point to creeping inhomogeneities in the ship routing maps and in the frequency of extreme wind situations in the wind analyses used in the wave hindcast. Only the trend in the maximum is not changing its sign when extending the 1961–87 time series by about 10 yr to the 1955–94 time series.

At the present time, we cannot determine to what extent the increases in wave height are due to improved air pressure analysis techniques and how much is due to a real worsening of the wave climate. However, the lesson to be learned from Fig. 8 is that there is indeed

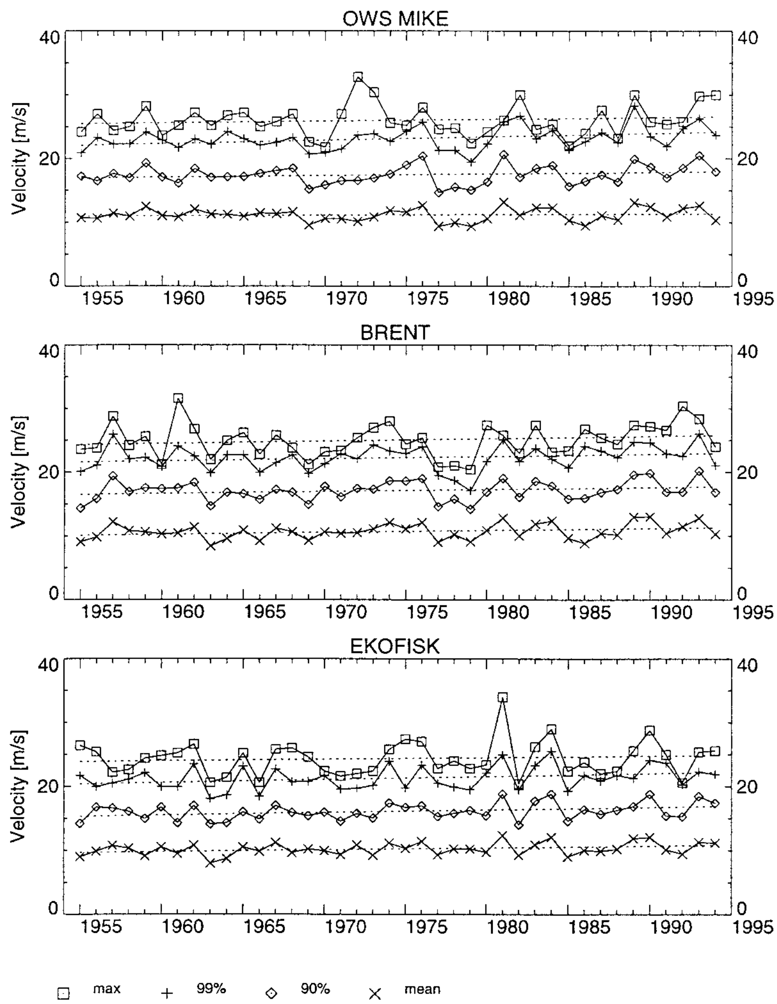

FIG. 9. Annual maxima, means, and 99% and 90% percentiles of wind speed percentiles (for OWS Mike, Brent, and Ekofisk, see Fig. 2) as derived from DNMI analyses. Trends are given as dashed lines. Units: m s^{-1}.

an upward trend in the past 40 yr at the locations of OWS M, Brent, and Ekofisk. Another characteristic of the time series is the presence of irregular temporal variations on all timescales, from year to year to interdecadal.

c. Analysis of wave hindcast 1955–94: Overall statistics

A convenient summary of systematic changes in the frequency of tall waves is a map of the trend in the 90% quantiles, as shown in Fig. 11. In both the North Sea and the Norwegian Sea, the trend is upward with an increase of about 1 cm yr^{-1} (or, equivalently, 40 cm over the considered time interval 1955–94). A local maximum of the trend is obtained northwest off Scotland, with mean annual increases of about 2 cm yr^{-1}. Otherwise, the trend is mostly negative, with decreases of about 1 cm yr^{-1} in the area west of Ireland, in the open Atlantic Ocean, and, with somewhat slower decreases, in the Bay of Biscay. On the boundary of the considered area, in particular on the southern and northern boundaries, larger trends appear, which may partly reflect boundary effects or inhomogeneity problems with the wind fields in these data-sparse areas.

5. Reconstruction of past wave statistics at selected locations

Von Storch and Reichardt (1997) developed a statistical technique that allows the backward reconstruction of intramonthly percentile time series of some local variable and the construction of scenarios for these intramonthly percentiles consistent with a given global climate change scenario. The basic idea is to first build a statistical model that links the intramonthly percentiles to planetary-scale monthly mean air pressure (or other) fields, and then to use this link to derive estimates of intramonthly percentiles from historical monthly mean air pressure maps or from air pressure fields changes simulated in climate change scenarios.

The base model is explained in section 5a; it deviates from the technique used by von Storch and Reichardt (1997) in that redundancy analysis is used rather than canonical correlation analysis. Since this model is nonstandard and has not yet been described in the open literature, section 5a is somewhat more detailed than the other parts of this paper. The model is applied to two locations, the oil fields Brent (between Scotland and Norway) and Ekofisk (central North Sea). The results for the two positions are discussed in some detail in section 5b. Scenarios for plausible future statistics are derived in section 6b.

a. The statistical model for extending the data in time

A regression model is built that relates two sets of random vectors $\mathbf{S}_t$ and $\mathbf{Q}_t$. In the present cases, the vector time series $\mathbf{S}_t$ represents the winter (DJF) monthly

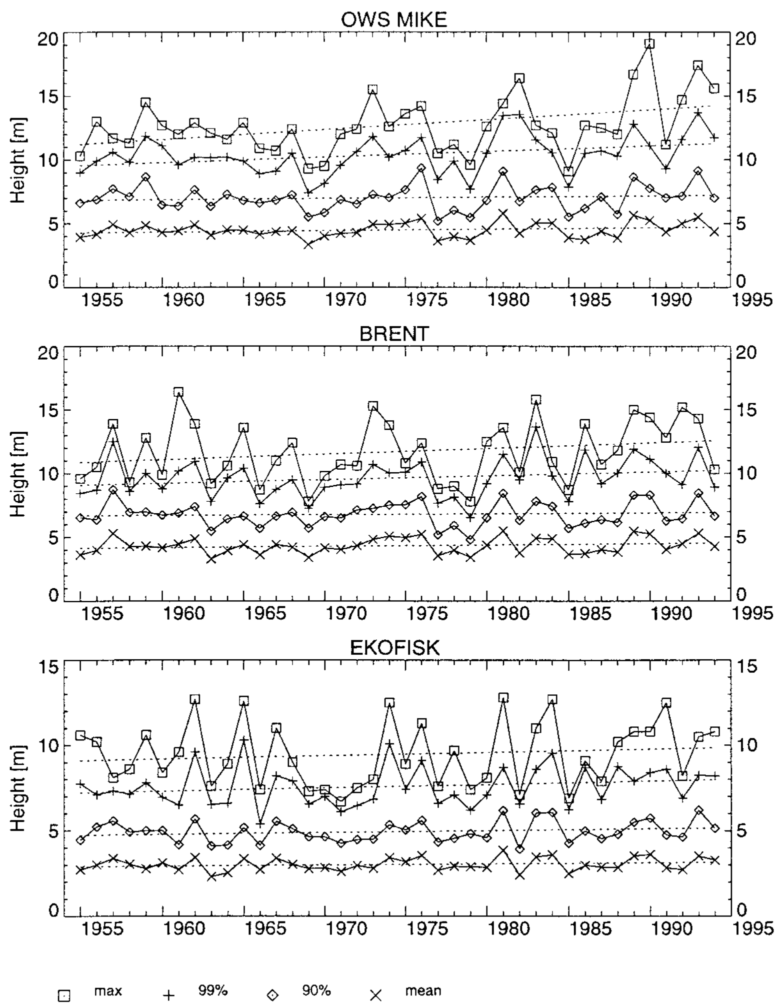

FIG. 10. Annual maxima, means, and 99% and 90 % percentiles of significant wave height percentiles (for OWS Mike, Brent, and Ekofisk, see Fig. 2) as derived from the wave hindcast. Trends are given as dashed lines. Units: m. (From Günther et al. 1998.)

mean air pressure (sea level pressure, SLP) distributions. The other vector time series $\mathbf{Q}_t$ is formed by the 50%, 80%, and 90% intramonthly quantiles of significant wave height at a given location (Brent or Ekofisk):

$$\mathbf{Q}_t = \begin{pmatrix} q_{50\%} \\ q_{80\%} \\ q_{90\%} \end{pmatrix}_t . \tag{1}$$

Both vectors are assumed to be centered; that is, their time means are subtracted prior to the analysis. Also, compression of the data with the help of EOFs is done prior to the analysis in order to avoid artificially enhanced correlations. Four EOFs are used for SLP and two for the intramonthly percentiles.

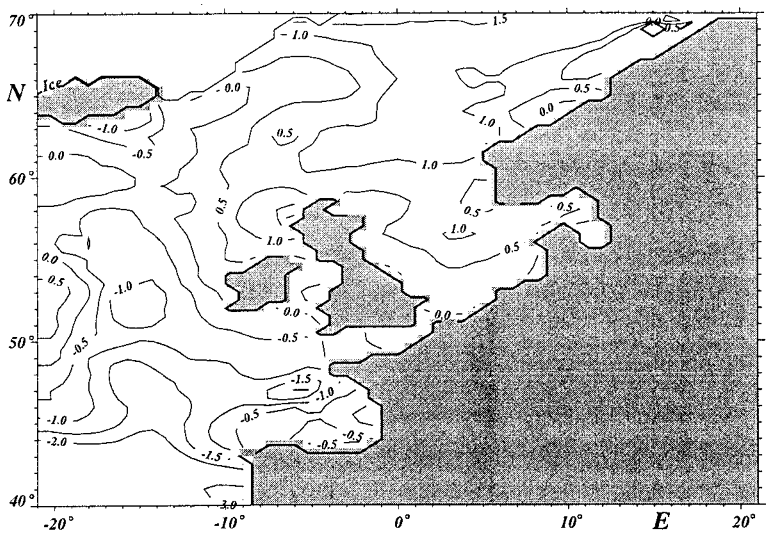

FIG. 11. Map of the 1955–94 trends in the intraannual 90% quantiles of significant wave height, as derived from the 40-yr hindcast executed with the WAM wave model. Units: cm yr^{-1}. (From Günther et al. 1998.)

A redundancy analysis (RDA) (Tyler 1982; von Storch and Zwiers 1998) is performed with the two vector time series. The result of an RDA are pairs of vectors ($\mathbf{p}^{s;k}$,$\mathbf{p}^{q;k}$) and time coefficients $\alpha_{s;k}(t)$ and $\alpha_{q;k}(t)$ so that

$$\mathbf{S}_t = \sum_{k=1}^{K} \alpha_{s;k}(t)\mathbf{p}^{s;k} , \tag{2}$$

$$\mathbf{Q}_t = \sum_{k=1}^{K} \alpha_{q;k}(t)\mathbf{p}^{q;k} . \tag{3}$$

The patterns $\mathbf{p}^{s;k}$ and $\mathbf{p}^{q;k}$ are determined such that the regressed expansion

$$\hat{\mathbf{Q}}_t = \sum_{k=1}^{K} \rho_k \alpha_{s;k}(t)\mathbf{p}^{q;k} \tag{4}$$

describes an optimum of variance of $\mathbf{Q}$ for a given number, K. In order to have uniquely determined solutions, the expansion patterns $\mathbf{p}^{q;k}$ of the *predictand* are required to be orthonormal, whereas the patterns $\mathbf{p}^{s;k}$ are required to be linearly independent. The first pair of patterns are chosen such that a maximum of $\mathbf{Q}$ variance is explained, the second pair such that a maximum of additional variance is represented [because of the orthonormality of the $\mathbf{p}^{q;k}$ patterns, the variance contributions in (4) may simply be added].

The coefficients are obtained by the projections

$$\alpha_{s;k} = \mathbf{S}^{\mathrm{T}}\mathbf{p}_A^{s;k}, \tag{5}$$

$$\alpha_{q;k} = \mathbf{Q}^{\mathrm{T}}\mathbf{p}^{q;k}, \tag{6}$$

where $\mathbf{p}_A^{s;k}$ are the adjoints to the patterns $\mathbf{p}^{s;k}$. In (6) the patterns $\mathbf{p}^{q;k}$ appear, since these are constructed to be orthonormal and thus self-adjoint. The patterns $\mathbf{p}^{s;k}$, on the other hand, are not orthonormal and therefore not self-adjoint.

The coefficients are normalized to one,

$$\mathrm{VAR}(\alpha_{q;k}) = \mathrm{VAR}(\alpha_{s;k}) = 1,$$

so that the three components of $\mathbf{p}^{q;k}$ may be interpreted as anomalies that occur typically together with the "field distribution" $\mathbf{p}^{s;k}$.

The downscaling model that relates the large-scale air pressure information to the intramonthly wave height information is a regression model $\alpha_{q;k} = \rho_k \alpha_{s;k}$ for the RDA coefficients $\alpha_{s;k}$ and $\alpha_{q;k}$. A reconstruction in the three-dimensional space is then obtained using (3):

$$\hat{\mathbf{Q}}_t = \widehat{\begin{pmatrix} q_{50\%} \\ q_{80\%} \\ q_{90\%} \end{pmatrix}} = \sum_{k=1}^{K} \rho_k \alpha_{s;k}(t)\mathbf{p}^{q;k} . \tag{7}$$

The regression model (7) may be applied to anomalies of observed or simulated air pressure fields $\mathbf{S} = \Sigma\alpha_{s;k}\mathbf{p}^{s;k}$.

The success of the reconstruction of intramonthly wave height percentiles is quantified by two measures of skill, namely, the correlation skill score ρ_κ and the percentage of represented variance ε_κ for κ = 50%, 80%, and 90% (Livezey 1995):

$$\rho_\kappa = \frac{\mathrm{Cov}\left(\hat{q}_{\kappa;t}, q_{\kappa;t}\right)}{\sqrt{\mathrm{Var}\left(\hat{q}_{\kappa;t}\right)\mathrm{Var}\left(q_{\kappa;t}\right)}},$$

$$\varepsilon_\kappa = 1 - \frac{\mathrm{Var}\left(\hat{q}_{\kappa t} - q_{\kappa;t}\right)}{\mathrm{Var}\left(q_{\kappa;t}\right)}, \tag{8}$$

where $\hat{q}_{\kappa;t}$ is the estimated κ percentile in the month *t*.

b. Results for Brent and Ekofisk

In this section the paired patterns $\mathbf{p}^{q;k}$ and $\mathbf{p}^{s;k}$ are shown and discussed for the wave height percentiles for the oil fields Brent and Ekofisk. The results for Brent are shown in some detail, whereas those for Ekofisk are only summarized.

Figure 12 and Table 1 display the first two RDA patterns of the monthly mean air pressure fields and wave height quantiles for Brent. The first air pressure pattern is related to the NAO (van Loon and Rogers 1978; Hurrell 1995). An intensified NAO in the monthly mean is associated with enhanced wave heights. In effect, this pattern describes a shift of the intramonthly distribution toward taller waves. The second pattern describes a mean southerly flow across the northern North Sea; the 50% quantile of the wave height distribution is enhanced, whereas the 90% is reduced by 26 cm, so that the overall distribution becomes narrower.

For Ekofisk similar patterns are found (not shown); the wave height anomalies are smaller than at Brent, and the second pair is slightly more relevant at Ekofisk for representing wave height variance.

In the second step, the observed monthly mean air pressure anomaly fields from 1899 until 1994 were fed into the regression model (7) and time series of the quantiles of wave height distribution at Brent are estimated. The last 40 yr may be compared with the hindcast data, whereas the first five decades represent our best guess and cannot be verified at this time.

For the 90% quantiles of wave height distribution, the reconstructed time series 1899–1994 and the hindcasted time series 1955–94 are displayed in Fig. 13. (The results for the other percentiles are similar and not shown for the sake of brevity.) In the past four decades, the similarity between hindcast and statistically derived heights is good (cf. Table 2), and the statistical model confirms the hindcasted increase. However, this increase appears “normal” when compared to the changes that may have taken place earlier in this century. Indeed, waves as tall as those nowadays seem to have occurred in the first two decades, when the NAO was strongest; in the 1920s the NAO weakened significantly (van Loon and Rogers 1978), and our statistical model indicates that concurrently the height of the waves dropped by several tenths of a centimeter per year.

TABLE 1. Characteristic anomalies of intramonthly percentiles of significant wave height at the oil field Brent (61°N, 1.5°E) north of Scotland in winter (DJF) as obtained in a redundancy analysis. The *k* row is the *k*th redundancy vector $\mathbf{p}^{q;k}$. This vector represents ε_k of the variance of **Q** within the fitting interval January 1955–February 1995. Its coefficient $\alpha_{q;k}$ shares a correlation of ρ_k with the coefficient of the air pressure pattern $\mathbf{p}^{s;k}$ within the fitting interval.

κ =	Wave height 50%	80%	90%	ε_k	ρ_k
k		**(cm)**		**(%)**	
1	−86	−114	−122	94	0.84
2	33	3	−26	5	0.08

TABLE 2. Correlation between hindcasted and reconstructed quantile time series, and proportion of described variance of wave height accounted for by the RDA model (7) at Brent and Ekofisk.

Quantile	Wave height 50%	80%	90%
BRENT			
Correlation (%)	84	82	78
Described variance (%)	70	67	61
EKOFISK			
Correlation (%)	73	69	63
Described variance (%)	52	47	40

Note that the trends in Fig. 11 cannot directly be compared with those in Fig. 13. Figure 11 is based on time series of annual quantiles, whereas Fig. 13 is derived from intramonthly quantiles in winter months (DJF).

6. Scenarios for the expected time of doubled carbon dioxide concentrations

In order to determine a consistent scenario of expected future wave height statistics in the northeast Atlantic, use is made of a a paired "2 × CO_2"/"control" time-slice experiment with a T106 atmospheric GCM (Bengtsson et al. 1995; Bengtsson et al. 1996; Cubasch et al. 1996). In the control time-slice experiment, the atmospheric GCM simulates the equilibrium response to present-day sea surface temperature and sea ice distribution and present carbon dioxide concentrations. For the 2 × CO_2 experiment, SST and sea ice distributions from a simulation with a coupled low-resolution atmosphere–ocean GCM with gradually increasing carbon dioxide concentrations are determined from the time of doubled carbon dioxide concentrations at about the year 2050 (Cubasch et al. 1992). These SST and sea ice distributions are then used as specified, time-constant lower boundary conditions for the T106 atmospheric GCM. Additionally, the carbon dioxide concentrations are doubled.

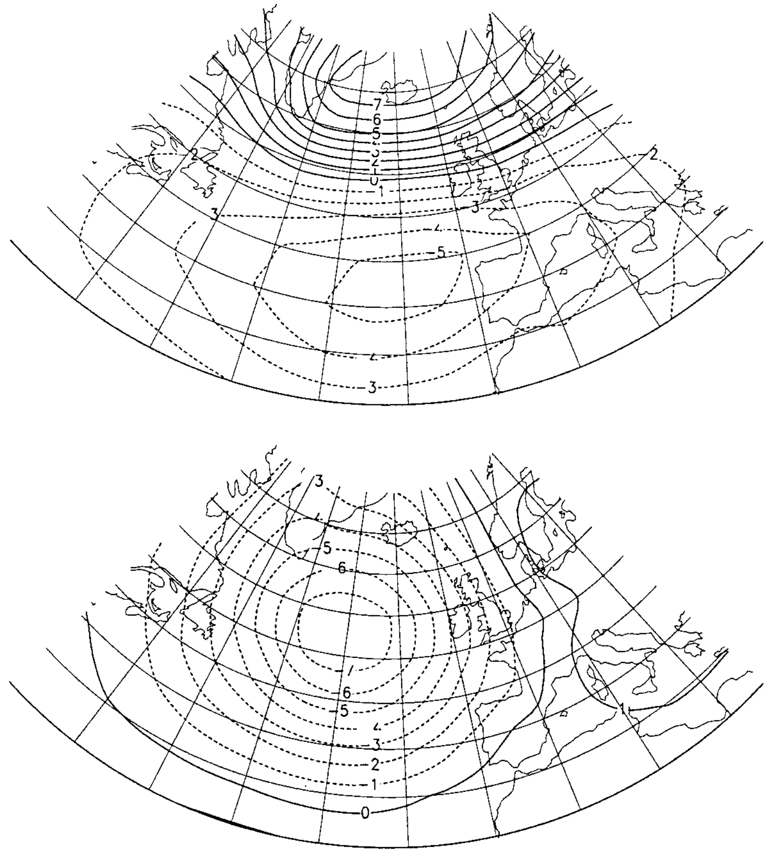

FIG. 12. First two monthly mean air pressure anomaly distributions identified in a redundancy analysis as being most strongly linked to simultaneous variations of intramonthly quantiles of significant wave height at Brent (61°N, 1.5°E). The anomalies of the quantiles at that position are listed in Table 1.

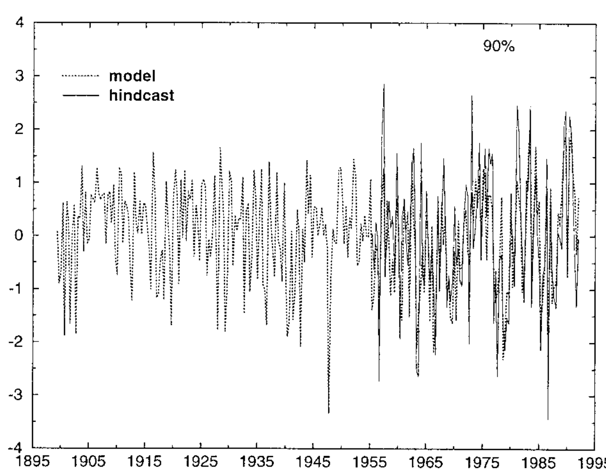

FIG. 13. Reconstructed (dashed line) and hindcasted (continuous line; 1955–94) anomalies of 90% quantiles of significant wave heights at Brent (61°N, 1.5°E). Units: m.

The time-slice experiments control and 2 × CO_2 were integrated for 6 yr. Clearly, an integration of only 6 yr is rather short (enforced by the enormous computational costs of such simulations), and the discrimination between interdecadal variability and the response to the changed boundary conditions and radiative forcing will be difficult. In fact, in turns out that the derived scenarios for storminess, wave climate, and storm surge statistics can hardly be distinguished from the natural variability (see below).

The output of the time-slice experiments is used for deriving scenarios of changing storminess, wave climate, and storm surge statistics. This is done with two different approaches. First, the simulated weather streams, in terms of near-surface wind, are considered (Beersma et al. 1997) and fed into the WAM wave model (Rider et al. 1996) and into a storm surge model (Flather and Smith 1998; Langenberg et al. 1997). The results of this exercise are presented in section 6a. The other approach makes use of the RDA model presented in section 5: The time mean difference of SLP in the two time-slice experiments is fed into (7) (see section 6b).

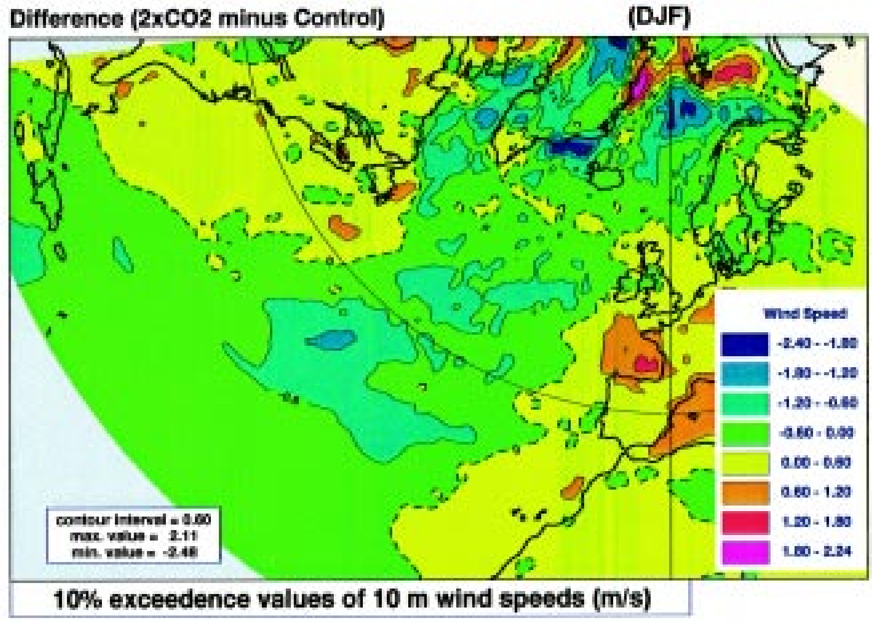

FIG. 14. Change in the intraannual 90% quantiles of wind speed as derived from a paired atmospheric circulation model run with present and doubled carbon dioxide conditions. Units: m s^{-1}. (From Beersma et al. 1997.)

a. *Dynamically derived scenarios*

The T106 atmospheric GCM operates with a horizontal resolution of approximately 75 km, which is thought to be sufficient for modeling a realistic weather stream, that is, storms and high pressure systems that are consistent with observed weather in terms of duration, frequency, strength, and track. Therefore, this specific climate change experiment was used in the WASA project in spite of the short simulation time.

Beersma et al. (1997) examined the output of the T106 simulations and found the simulated weather stream to be consistent with observations during a positive phase of the North Atlantic oscillation, that is, a phase with westerlies stronger than on average.

The intercomparison of the two simulations, control and 2CO$_2$, yielded only few changes between the present and prospective future storm climate (Fig. 14). In the Bay of Biscay the 90% quantiles of wind speed are simulated to be increased by up to 1.5 m s^{-1} and in the central North Sea up to 0.5 m s^{-1}. Over most of the Atlantic, however, the wind speed in the climate model is decreased by as much as 1 m s^{-1}.

Both weather streams, from the control run as well as the 2 CO$_2$ run, were used as forcing fields for the wave model WAM (Rider et al. 1996). The 90% wave height quantiles are found to increase in the Bay of Biscay and in the North Sea by up to 0.5 m, whereas in most of the North Atlantic, the wave heights are decreasing (Fig. 15).

Flather et al. (1998) and Flather and Smith (1998) ran a storm surge model with the wind and air pres-

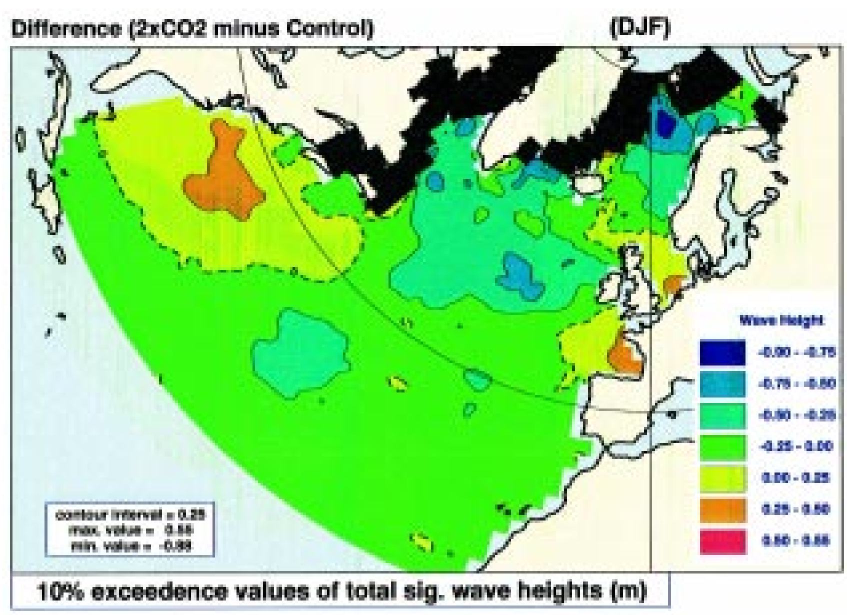

FIG. 15. Change in the intraannual 90% quantiles of significant wave height simulated by a wave model as a response to weather streams derived from a paired atmospheric circulation model run with present and doubled carbon dioxide conditions. Units: m. (From Rider et al. 1996.)

sure data from the DNMI analysis 1955–94 (reference run) and from the two time-slice experiments. It was found that the reference run quite successfully reproduced the storm surge statistics derived from various tide gauges along the North Sea coast as well as the along Irish and British coasts. The control time-slice experiment significantly underestimated the height of the severe storm surges. The difference, in terms of 5-yr return values, between the 2 CO_2 and the control run surges was everywhere positive, with maximum values of 65 cm in the German Bight and 30 cm along the Dutch coast (see Fig. 16). When compared with the variability of 5-yr return values calculated from different 5-yr chunks of the reference (DNMI wind) run, these changes appeared within the range of natural variability. However, without further data, Fig. 16 may be considered as a best estimate at this time.

Langenberg et al. (1997) also integrated a storm surge model with the T106 weather streams and found a moderate increase of severe storm surges in the North Sea consistent with Flather's results. According to their analysis the increase is mainly due to an increase of the mean water level and not caused by storm-related short-term variations around the mean.

b. *Empirically derived scenarios*

An alternative scenario for possible future modifications of the surge climates is the use of the regression model (7). To do this, the mean difference of air pressure 2 CO_2–control from the paired T106 time-slice experiments is calculated (Fig. 17) and fed into the regression model for anomalies of intramonthly quantiles of wave heights at Brent in the northern North Sea and at Ekofisk in the central North Sea. This exercise yields the following results.

		Change (cm)	
Quantile	**50%**	**80%**	**90%**
Brent	13	18	20
Ekofisk	14	19	22

The statistical models predicts a small, almost uniform, shift of 10–20 cm of the wave height distribution toward taller waves. Thus, the projected changes of the wave height distribution at the two locations are small and qualitatively consistent with the results obtained in the dynamically derived estimates. Note, however, that the numbers cannot be compared one to one, as the dynamically determined numbers refer to annual quantiles whereas the statistical model returns intramonthly percentiles.

An advantage of the statistical method is that it does not require the availability of a realistic weather stream as only mean fields are processed. Therefore global climate change scenarios generated with coarse resolution, such as T42 (horizontal resolution approximately 300 km), can also be used as input. A time-slice experiment, formally identical to the one considered so far but integrated over 30 yr with a T42 resolution, is available and has been used for the derivation of another, equally plausible scenario. This results in decreases of the significant wave height percentiles at Brent of the order of 50–70 cm; at Ekofisk the reduction is about 10 cm for all three percentiles.

The T106 mean air pressure field was also used to estimate changes of storm-related surge percentiles at a number of southern and eastern North Sea coast tide gauges (Langenberg et al. 1997).

		Change (cm)	
Quantile	**50%**	**80%**	**90%**
Den Helder	6	7	8
Esbjerg	8	11	13

These numbers compare well to the estimate given by von Storch and Reichardt (1997) for Cuxhaven. If the T42 time-slice experiment is used instead of the T106, then the changes of storm-related percentiles are still positive but considerably smaller.

7. Conclusions

a. *Analysis of past hundred years*

Our joint efforts for determining whether the storm and/or wave climate in the North Atlantic Ocean and adjacent seas have roughened resulted in two findings.

- *The storm and surge climate along the European coasts has not roughened in the past hundred years.* This result is consistent with other analyses based on local data. For instance, Jónsson (1981) studied the number of "storm days" on Iceland, as defined by local observations, and found no systematic changes (cf. von Storch et al. 1994).

  The Koninklijk Nederlands Meteorologisch Instituut published an assessment on the state of climate and its change for the territory of the Neth-

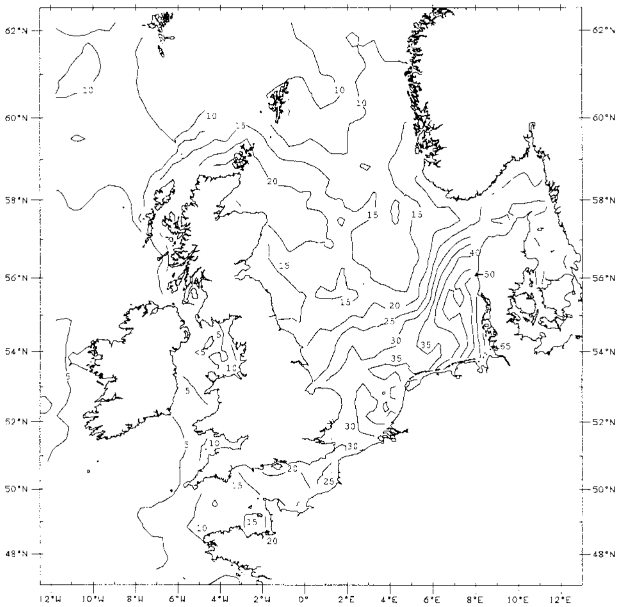

FIG. 16. Difference of 5-yr return values of water level heights, derived from simulations of a storm surge model, forced with winds and air pressure from the 2 CO_2 and the control T106 time-slice experiments. The difference is within the bounds of natural variability. Units: cm.

erlands (KNMI 1993). According to that report the maximum wind speeds observed during severe storms have not increased between 1910 and today.

- For the wave statistics, hardly any reliable estimates about systematic trends can be derived for in situ data, and all numbers established on these grounds should be considered as upper bounds of any real roughening.

  To overcome this situation, the Waves and Storms in the North Atlantic (WASA) project has executed a four-decade-long hindcast. This hindcast suffers again from inhomogeneities inherited from the wind–air pressure analyses. It is hoped, however, that the derived empirical model is less affected by these problems.

  The empirical model confirms the finding of a roughening wave climate in the past four decades and relates it in part to a change of the strength of the North Atlantic oscillation (cf. Hurrell 1995).

  However, the increase of the last decades does not appear alarming when compared to the reconstruction of the wave field earlier this century.

In summary, it is claimed that neither the storm climate nor the wave climate has undergone significant systematic changes in this century. Instead, the situation is masked by the presence of natural variability on all timescales, ranging from year to year to interdecadal. This low-frequency variability violates the basic assumption of stationarity in conventional extreme value analyses and coastal engineers should be aware of this violation as a potential pitfall in conventional data analysis.

The recent increase in wave heights, the reality of which is still questionable, might well be another swing in the never-ending sequence of ups and downs of natural variability. Further close monitoring of the development is required to eventually evaluate whether the other possible explanation—systematic changes because of anthropogenic climate change—might be adequate (cf. von Storch and Hasselmann 1995).

Our study has a number of caveats. The analysis of geostrophic winds, pressure tendencies, and high-frequency sea level variations covers only the near-coastal areas of northern Europe, and no robust analysis is available for open ocean regions. Also, one may speculate whether the link between these proxy data and the wind speeds holds for extreme wind speeds. Another caveat refers to the wave hindcast. This has been performed with wind analysis that over the course of time resolved more details (i.e., strong wind events); thus the diagnosed roughening of the wave climate in the past decades may still be artificial to some extent.

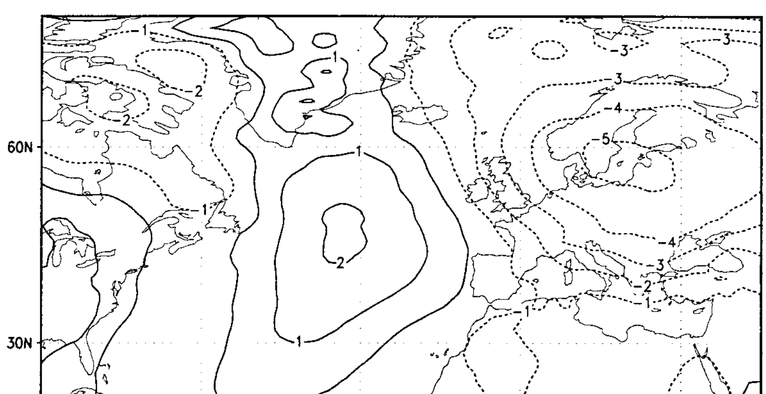

FIG. 17. Simulated atmospheric response to doubled carbon dioxide concentrations, as derived from a T106 time-slice experiment. The variable shown is air pressure at sea level, given in hPa.

b. *Outlook for the next century*

Our scenario for the expected time of doubled carbon dioxide concentrations points to moderate increases of surges along the North Sea coast and of wave heights in the Atlantic.

At this time, a word of caution is required. The scenarios given above are consistent with, and within, the range of previously observed variations. As such, they are plausible. However, they depend crucially on the validity of the driving GCMs; if these GCMs turn out to be inadequate then our numbers will be inadequate as well. Thus, these scenarios should not be given too much informational weight.

Also, no error bars are given for the scenarios. Such error bars are often considered by physicists to be indispensable but cannot be given with any degree of confidence for scenarios. The expected error is composed of many factors, such as the natural variability of the system, the uncertainty in the timing of the expected atmospheric doubled carbon dioxide concentration, or errors originating from the various parameterizations in the used climate model. Since the climate models are tuned to the observational record and only one such record exists, rigorous statements about errors cannot be made.

c. Other aspects

A topic not within the focus of the WASA project, but of related interest, is the Baltic Sea. Here as well, increased storm surge levels have been reported, but Backmann and Tetzlaff (1998) showed that the increase since the 1950s is mainly due to the increased volume of the Baltic as a result of intensified mean westerly winds (cf. Heyen et al. 1996). Also, levels of wave activity were found to be more or less constant (Mietus and von Storch 1997).

Other aspects examined in the WASA project concern the potential of changing storm surges at the southern North Sea coast (Bijl 1997) and a process study demonstrating that an acceleration of the weather stream does not cause a significant intensification of the heights but rather a reduction (Bauer et al. 1996).

Acknowledgments. This paper is based mostly on the various papers that have emerged in the WASA project. Additionally, the following members of the project have contributed: Slava Kharin, Hinrich Reichardt, Knut Iden, Jules Beersma, Hans von Storch, Marek Stawarz, Hans Alexandersson, Eigil Kaas, Roger Flather, Torben Schmith, Gerbrand Komen, Arnt Pfizenmayer, Heike Langenberg, Magnar Reistad, Ignacio Gonzalez, and Mirek Mietus. The T106 scenario was kindly supplied by Ulrich Cubasch (DKRZ Hamburg) and Lennart Bengtsson (MPI für Meteorologie). The ongoing encouragement and support by Dr. Ib Troen from the Commission of the European Union is gratefully acknowledged. Scott Hanson helped with editorial advice. The WASA project was funded by the European Union's Environment program from 1994 to 1997: EV5V-CT94-0506.

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[redacted]

From: Monica Wagner
Sent: Thursday, December 31, 2015 12:53 PM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

The LA Times said was “a quasi-governmental organization” formed by “representatives from the oil industry, insurance companies and several North American and European governments” but it sounds like that wasn’t correct?

From: Alan Belensz
Sent: Thursday, December 31, 2015 10:25 AM
To: Monica Wagner; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

It appears the WASA Group consisted of a group of European researchers evaluating the potential for increased storminess in the North Atlantic. A 1998 paper listing the scientific researchers is attached.

From: Monica Wagner
Sent: Thursday, December 31, 2015 10:01 AM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

It’s jampacked. Have we heard of the Waves and Storms of the North Atlantic Group?

From: Alan Belensz
Sent: Thursday, December 31, 2015 9:26 AM
To: Lemuel Srolovic; Monica Wagner; Mandy DeRoche; Philip Bein; Laura Heslin; Kevin Olson
Subject: RE: One more

Wow, much here to digest.

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM
To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
Subject: Fwd: One more

Latest from LA Times.

Sent from my iPhone

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** December 31, 2015 at 6:46:12 AM EST
> **To:** Lemuel Srolovic <Lemuel.Srolovic@ag.ny.gov>
> **Subject: One more**

Before year's end.
http://graphics.latimes.com/oil-operations/

Happy New Year

Lee Wasserman
Rockefeller Family Fund

[redacted]

From: Alan Belensz
Sent: Thursday, December 31, 2015 2:15 PM
To: Monica Wagner; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

All I could find with a quick Google search is the paper I sent around. [redacted]

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[redacted]

From: Monica Wagner
Sent: Thursday, December 31, 2015 2:31 PM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

What a skeptic you are (except about climate change).

From: Alan Belensz
Sent: Thursday, December 31, 2015 2:15 PM
To: Monica Wagner; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

All I could find with a quick Google search is the paper I sent around [redacted]

From: Monica Wagner
Sent: Thursday, December 31, 2015 12:53 PM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

The LA Times said was "a quasi-governmental organization" formed by "representatives from the oil industry, insurance companies and several North American and European governments" but it sounds like that wasn't correct?

From: Alan Belensz
Sent: Thursday, December 31, 2015 10:25 AM
To: Monica Wagner; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

It appears the WASA Group consisted of a group of European researchers evaluating the potential for increased storminess in the North Atlantic. A 1998 paper listing the scientific researchers is attached.

From: Monica Wagner
Sent: Thursday, December 31, 2015 10:01 AM
To: Alan Belensz; Lemuel Srolovic; Mandy DeRoche; Philip Bein; Laura Heslin
Subject: RE: One more

It's jampacked. Have we heard of the Waves and Storms of the North Atlantic Group?

From: Alan Belensz
Sent: Thursday, December 31, 2015 9:26 AM
To: Lemuel Srolovic; Monica Wagner; Mandy DeRoche; Philip Bein; Laura Heslin; Kevin Olson
Subject: RE: One more

Wow, much here to digest.

From: Lemuel Srolovic
Sent: Thursday, December 31, 2015 8:53 AM

To: Monica Wagner; Mandy DeRoche; Alan Belensz; Philip Bein; Laura Heslin; Kevin Olson
Subject: Fwd: One more

Latest from LA Times.

Sent from my iPhone

Begin forwarded message:

> **From:** Lee Wasserman <lwasserman@rffund.org>
> **Date:** December 31, 2015 at 6:46:12 AM EST
> **To:** Lemuel Srolovic <Lemuel.Srolovic@ag.ny.gov>
> **Subject: One more**
>
> Before year's end.
> http://graphics.latimes.com/oil-operations/
>
> Happy New Year
>
> Lee Wasserman
> Rockefeller Family Fund