A NEARLY CARBON-NEUTRAL CONFERENCE MODEL

WHITE PAPER / PRACTICAL GUIDE

Air travel to conferences, talks, and meetings can account for a third or more of the carbon footprint for a typical scholar or university. Some scholars routinely fly over 100,000 miles per year. This document both explores this problem and offers a nearly carbon-neutral (NCN) conference alternative, which is completely free of cost, that can reduce these carbon footprints by a factor of 100 or more. The first events to employ this NCN conference approach took place in May (visit the archived website) and Oct/Nov (website) of 2016. Our most recent NCN conference was the June 14-30, 2018 ASLE-Sponsored Symposium *A Clockwork Green: Ecomedia in the Anthropocene* (website). Jump down to Intro.

Regarding COVID-19: because there has been a good deal of attention given to this NCN model in light of the pandemic, the publisher of my most recent book (Routledge) was kind enough to allow me to post here the appendix chapter from *Writing a New Environmental Era: Moving Forward to Nature.* It addresses specific aspects of the NCN approach, such as how participants felt about the loss of direct human contact, adapting the model for roundtables, whether NCN talks "count" during promotion reviews, and so forth. It can be found below under "Details."

CONTENTS

Panel HTML

Acknowledgments

WHITE PAPER

Introduction

UC Santa Barbara (UCSB) recently calculated the size of its carbon footprint. The assessment not only included the immediate campus and its vehicle fleet, but also a range of facilities and activities that support it, including campus housing. One area in particular stood out.

Roughly one third of UCSB's carbon footprint comes from faculty and staff flying to conferences, talks, and meetings. All this air travel annually releases over 55,000,000 pounds of CO2 or equivalent gasses directly into the upper atmosphere, where they contribute most to climate change. Putting 55 million pounds of CO2 into human terms, this is equal to the total annual carbon footprint of a city of 27,500 people in the Philippines. Note that this is more than UCSB's undergraduate, graduate, and faculty populations combined and that many climate scientists recommend that planetary greenhouse gas (GHG) emissions be not much more than the current per capita level of the Philippines.

This issue can also be approached personally. When Peter Kalmus, a climate scientist at NASA's Jet Propulsion Laboratory (and a speaker at UCSB's first nearly carbon-neutral conference), did the math, he found that two-thirds of his annual GHG emissions came from travel to and from conferences and meetings. The remaining third was from his car, electricity use, natural gas for heating his home and cooking, food, sewage, and so forth. Not all scholars travel this much; however, a single roundtrip transcontinental flight releases one metric ton of CO2 per

coach passenger, which is equal to the recommended annual emissions allowance for each person on the planet if we hope to limit global temperature rise to 1.5 degree Celsius (the goal set forth at COP 21).

Although GHG emissions obviously vary across individuals and institutions, this is a major issue for academia. Put bluntly, air travel is, environmentally, academia's biggest dirty little secret. And opting out is generally not much of an option. "Publish or perish" has a less famous corollary: present or perish. At many institutions, conference presentations are tallied up alongside publications at tenure and other merit reviews. From graduate students advised to network at these events to seasoned scholars delivering the keynotes, conference participation is in academia's DNA.

As the U.S. is home to nearly 5000 colleges and universities, tens of thousands of academic conferences take place every year. Some are quite large. The annual Modern Language Association (MLA) convention averages over 7000 participants. And academic conferences are just the tip of the iceberg. Some estimates put the total number of participants at all conferences, seminars, and similar meetings in the U.S. alone at over 200 million annually.

Yet, traveling by air is a privilege that few share globally. The overwhelming majority of people on the planet will never step foot in an airplane. Only 5% of the world's population flies annually. Even among Americans, half do not annually fly and just a quarter do so three or more times a year. Unfortunately, academics often find themselves in this last, rarified group because of conference travel. If we were to equate this to ground transportation, we would not be among those walking, biking, or using mass transit, or even those carpooling in hybrid cars. We would be the solitary SUV drivers.

What's worse, the traditional conference has more than just environmental shortcomings. The cost of airfare from anywhere in the developing world to anywhere in North America or Europe is often greater than the per capita annual income in these countries. Consequently, scholars from most of the world's countries, and nearly the entire Global South, have long been quietly, summarily excluded from international conferences. Even in wealthy countries like the U.S., conference participation is, owing to vagaries in funding, a privilege unequally shared.

What's to be done? While attending fewer or only local conferences is an option, at UCSB we have been developing and experimenting with an online, nearly carbon-neutral (NCN) approach for conferences. This model was first implemented in May of 2016 (visit conference website). A second NCN conference, which featured Bill McKibben as one of its keynote speakers, took place at UCSB in Oct/Nov of 2016 (website).

Even though online activity has its own carbon footprint, crouching the numbers for UCSB's two pilot conferences revealed that their total GHG emissions were less than 1% of traditional, fly-in events. When asked if this NCN conference approach was successful, 87% of the speakers from the first event responded "yes," 13% "not sure," and 0% "no."

This document was created to help stage NCN conferences based on this UCSB model. It both explores the rationale behind this approach and provides a step-by-step guide for staging such events. An individual familiar with WordPress installations should be able to have a conference space (website) prepared in less than a day.

In a nutshell, here is how this NCN approach works (note that it differs significantly from a typical webinar using Skype or similar technologies):

1) *Speakers record their own talks*. This can be A) a video of them speaking, generally filmed with a webcam or smartphone, B) a screen

recording of a presentation, such as a PowerPoint, or C) a hybrid of the two, with speaker and presentation alternately or simultaneously onscreen. Here are examples of speaker, presentation, and hybrid presentations from the May 2016 UCSB conference. Alternate approaches are also possible, such as this talk from the conference, which is a short documentary with the talk as a voiceover. Note that even smartphones can now produce videos of broadcast resolution.

2) *Talks are viewed on the conference website*. Once made available on the conference website, talks can be viewed at any time. Talks are organized into panels (i.e. individual webpages) that generally have three speakers each and a shared Q&A session – just like a traditional conference. As they are prerecorded, videos can be closed captioned for greater accessibility, as were all the talks for UCSB's second NCN conference. Visit a sample panel.

3) *Participants contribute to an online Q&A session*. During the time that the conference is open, which is generally two or three weeks, participants can take part in the Q&A sessions for the panels, which are similar to online forums, by posing and responding to written questions and comments. Because comments can be made at any time in any time zone, participants from across the globe can equally take part in the conference. Jump to a sample Q&A.

While this NCN model is just one of many possible, because this approach has advantages that go beyond helping to mitigate climate change, it makes clear that a range of new technologies have opened up exciting possibilities for reimagining the traditional conference:

1) Without the requirement of travel, scholars can participate from nearly anywhere on the globe, as prerecorded talks can be viewed at any time and text-based Q&A sessions extending over multiple weeks

eliminate the challenge presented by world time zones, thereby facilitating truly global interaction. One of the pilot NCN conferences had participants from six continents.

2) This approach is generally more accessible than its traditional counterparts, as A) eliminating travel also eliminates many hurdles to physical accessibility, B) prerecorded talks can be closed captioned for hard-of-hearing individuals, and, C) with respect to the visually impaired, conference websites can be optimized for audio screen readers and talks can also be made available as audio podcasts.

3) Similar to open-access journals, the archive created by NCN conferences (both recorded talks and Q&A transcripts) gives nearly anyone anywhere on the globe, as long as Internet access is available, instant and lasting access to all the cutting-edge material introduced at the event. In contrast, traditional conferences are often closed-door affairs open to only a privileged few. In many respects this online conference archive challenges the need for the print publication of select conference proceedings.

4) On average, the pilot conferences' Q&A sessions generated three times more discussion than takes place at a traditional Q&A. A few sessions generated more than ten or fifteen times more, making clear that, while different from a traditional conference, meaningful personal interaction was not only possible, but in certain respects superior.

5) Because the cost of a NCN conference is considerably less than its traditional counterparts, a range of groups and institutions, such as schools in the developing world currently lacking the significant financial resources required to coordinate international conferences, are now able to do so. Our pilot conferences were cobbled together largely using free, open-source software.

6) Conference talks can be closed captioned in more than one language. Although this was not done for the pilot conference, future UCSB events are being planned with talks by speakers in their native languages that will be closed captioned in English. In addition, we plan to have all talks captioned in Spanish as well as English, opening up the possibly of a true multilingual conference.

7) Such events can result in far more efficient use of a conference goer's time, as one can quickly scan through the text of a talk or a Q&A session for material of interest. Consequently, this NCN approach allows us to listen to all the talks of interest to us – and none of those that are not – in the order, and at a time, of our choosing (more).

At first glance it may seem that conducting an online academic conference using real-time video conferencing solutions (such as Skype, Zoom.us, WebEx, GoToMeeting, or Google Hangouts) would be a viable alternative to this NCN approach; however, doing so would risk eliminating nearly all of the above advantages. Unlike real-time approaches, prerecording talks make them more accessible, as they can be conveniently viewed in any country or time zone (#1 above) and can be carefully closed captioned in advance for accessibility (#2), including in additional languages (#6). Asynchronous Q&A sessions taking place over a number of weeks not only allow truly global interaction between participants in different time zones (#1), but also provide a space for more and and arguably higher quality discussion (#4), as well as more efficient use of participants' time (7). Moreover, the material presented and generated there can be archived as a lasting reference (#3).

Let's be honest: it is unlikely that an online conference experience will ever replicate face-to-face interaction. Granted. However, given the horrific environmental costs and inherently exclusionary nature of traditional conferences, the time has come to radically rethink this

cornerstone practice of our profession. This NCN conference experiment is an attempt to do just that.

About This Document

Given the urgent need to globally reduce GHG emissions, an early draft of this document was released In June of 2016 less than a month after the pilot UCSB event so that additional NCN conferences could be staged on this model. It was written by UCSB professor Ken Hiltner, © 2016-2020. It includes revisions of early material that I created for the above-mentioned conferences, such as their CFPs, as well as their opening and closing remarks (including the Q&A session for the opening talk of the May 2016 event and the Q&A for the Oct/Nov opening talk). Some of the material previously included in this White Paper has been removed, as it was included in my book on *Writing a New Environmental Era: Moving Forward to Nature* (Routledge, 2019).

Please feel free to modify the NCN conference approach explored here. As the goal is to create a viable alternative to the traditional conference, improvements to the approach are most welcome. Do experiment. And let me know what worked (and what didn't) so that future NCN conferences can be improved upon. Questions and feedback are most welcome. Please feel free to contact me.

The goal is to encourage as many individuals as possible – either as coordinators or speakers – to take part in NCN conferences. Consequently, a university in the developing world with a limited budget and largely outmoded desktop computers or an individual with a tablet costing under fifty U.S. dollars are as well positioned to take part in such conferences as anyone else. Moreover, since the technology used is relatively commonplace (the Q&A sessions, for example, are similar to online forums), this type of online conference experience proved to be largely intuitive to participants at the UCSB pilot events.

Because it is in part designed to be a practical guide, this document's appendices include resources such as a sample CFP, example emails, and HTML code. As noted above, authoring a conference website should be relativity straightforward for someone familiar with WordPress. Note that many students (graduate and undergraduate alike) often have the ability, as WordPress is an exceptionally popular website and blogging platform. Note too that a conference of this sort could be run from an existing WordPress website, as were the pilot UCSB conferences.

Nearly carbon-neutral (NCN) conferences have the potential to largely supplant their traditional counterparts. If we hope to meet the ambitious goals for climate change mitigation set by the COP21 in Paris in 2015, we all need to get to work rethinking a range of personal activities that we often take for granted. With respect to academia, conference travel is environmental enemy #1 and an excellent place to start.

Details

Because we have now staged five conferences based on this Nearly Carbon-Neutral (NCN) model, it has elicited a range of questions from individuals interested in the approach. Here are a few of them and my responses. Many of the below points have nothing to do with environmental issues, such as climate change. I am of the mind that if we hope to rewrite a cultural practice, perhaps the best approach is to make it appealing for a range of reasons (in this case, some environmental, some not).

Environmentally, just how big is this problem? Unfortunately, it is staggering in scope. Let's take the University of California at Santa Barbara (UCSB) as an example. As part of its Climate Action Plan, UCSB carefully calculated its total greenhouse gas (GHG) emissions. This evaluation revealed that 30% of UCSB's total GHG emissions come from air travel, such as to conferences, talks, and meetings. If we remove

commuting from the equation, air travel jumps to 35%. This 30% (or 35%) figure for air travel represents approximately 55,000,000 pounds of CO2 or equivalent gasses. At the risk of stating the obvious, this is an astonishing amount of GHG emissions.

A little math reveals the enormous global scope of the problem: Just twenty schools like UCSB would have combined GHG emissions for air travel of more than a billion pounds per year. As there are nearly 5,000 colleges and universities in the U.S. alone, the planet's institutions of higher learning are responsible for many, many billions of pounds of GHG emissions annually. All just from flying.

While these dismal figures contain a sobering indictment of our profession, or at least one of its cornerstone practices, the good news is that this is a problem that can be largely solved – and solved now. This would not have been the case twenty or even ten years ago, as the necessary technology had not matured to its current level or price-point. For example, ten years ago the modern smartphone (which helped bring inexpensive, high-definition video capabilities to desktop computers as well) did not exist. Similarly, broadband Internet capable of streaming broadcast-quality video was globally something of a rarity at the time.

The challenge now is to find digital alternatives that can supplant the traditional conference. While I am endorsing a particular NCN conference model here, any and all alternatives that can respond to this challenge should obviously be considered.

What about the loss of direct human contact? This is undoubtedly the #1 concern that is raised in relation to this conference model. However, once they learn that air travel to conferences and similar events is our profession's single largest course of GHG emissions, few scholars believe that direct human contact is worth the environmental cost. Nonetheless, this is an important issue that needs to be taken up.

It should be acknowledged from the start that it is unlikely that any kind of virtual interchange can truly replicate face-to-face human contact. Most of us have had experience with Skype-type talks, conference versions of these, phone calls, as well as written back-and-forth discussions in forums, emails, IM chats, etc. None of these replicates a face-to-face meeting.

Nonetheless, if human contact at conferences primarily centers around the discussion of ideas, then the NCN model is fully capable of giving traditional conference interaction a run for its money. As noted above, the average amount of online discussion in the Q&A sessions for the UCSB pilot conferences was three times greater than takes place in a conventional Q&A.

Of course, this sort of discussion is not of the face-to-face variety. However, studies suggest that people take online relationships more seriously than we might suspect. In their book *Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution*, Jim Blascovich and Jeremy Bailenson note that studies reveal that “young adults consider their Facebook friends just as important as the people who live close enough to meet physically” (2).

After the May 2016 UCSB conference concluded, its speakers were polled for their feelings on this issue. They were first asked “Did you meaningfully ‘connect’ with people in the Q&A sessions?” 73.3% of those who responded said “yes,” 26.7% “not sure,” and 0% “no.” They were then asked “Was the lack of direct human contact at the conference a significant shortcoming?” 60% replied “no,” 20% “not sure,” and 20% “yes.”

The fact that 1) only one in five of the respondents found the loss of direct human contact a significant shortcoming and 2) nearly three out of four felt that they had meaningfully connected with others during the

conference, suggests that this issue may not be as significant as one might imagine.

It is also helpful to put this potential shortcoming of the NCN conference in perspective with its advantages. When taking up this issue in one of the Q&A sessions for the May 2016 UCSB conference, Jon Mills, one of the speakers, had this to say:

> Of course, not having direct human interaction with the audience and colleagues is a limitation, but it is a small price to pay, almost inconsequential, when we look at the overall value of getting ideas distributed on a global scale, which certainly may have more impact…than just a handful of people attending a talk, especially when it is archived and potentially available to viewers any time, as well as those who could not attend, or were disinclined to, or could not afford to attend.

Note that Mills focuses on the cultural rather than environmental advantages, which are obviously significant.

But it is true that there are other types of contact at conferences, such as casual discussion in halls and at dinners. These interactions can be important to us all, but especially to individuals that are early in career, hoping to make contacts that will benefit them in the years to come.

At the onset, it needs to be acknowledged that, like the traditional conference itself, this risks being both a practice of privilege and a limiting one. Many individuals will never be able to receive the benefits of direct human contact owing to geographical and financial limitations, issues of physical accessibility, and so forth. This is not only limiting for those excluded, but for all of us as we miss out on the opportunity to meet a broad swathe of scholars unable to attend such conferences.

It is, consequently, unfortunate that such crucial academic relationships have traditionally required direct proximity. Wouldn't it be far better if proximity and time zones were not an issue and we could interact with scholars the world over with interests that intersected with ours? This NCN conference approach seeks to leverage the power of social media to help build and strengthen academic relationships online.

Will speakers want to take part in these conferences? Prior to releasing the Call for Papers (CFP) for the May 2016 UCSB conference, this was a major question and concern for me. As was noted on the initial CFP, instead of traveling to the conference to attend panels and deliver a talk, prospective speakers needed to agree to the following unusual requirements:

> 1) Film themselves giving a talk of 15-17 minutes.
>
> 2) Take part in their online Q&A session by responding to questions raised by their talks.
>
> 3) View as many of the talks as possible, posing questions of their own.

For a typical conference of this sort, 25-50 submissions might have been expected. The UCSB pilot conference received over 100. Speakers ranged from Ph.D. candidates to senior scholars.

It soon became clear that the format contributed to the success of the conference rather than jeopardized it, as scholars from eight countries spoke at the event. As John Ryan, one of the speakers succinctly noted in one of the conference Q&A sessions:

> Living in Thailand now, after 7.5 years in Australia, the issue of equity really resonates. Professors at Thai universities earn between $10-12,000 US per year, a high salary for Thailand. There also appear to

be fewer research funds and conference travel support programs here. Attending an international conference, after the registration fee, flights, taxis, accommodation, and meals, could cost 1/10th of an academic's annual wages. So an online asynchronous format has huge potential to remedy some of the issues of equity in the global academic environment while bringing important research from under-served regions such as SE Asia to an international audience.

Consequently, while some scholars may eschew participating in such an unusual event, many others around the world may well embrace the opportunity.

Will keynote speakers want to be involved? Yes, if our May 2016 UCSB conference is any indication. Once we explained that we were trying to stage a conference that was more egalitarian, accessible, and environmentally sound, potential speakers became sympathetic to the cause. This included Peter Singer (the DeCamp Professor of Bioethics in the University Center for Human Values at Princeton University – in 2005, *Time* magazine named him one of the 100 most influential people in the world) and Kim Stanley Robinson (one the most respected climate-fiction novelist writing today in the English language).

An advantage for keynote speakers is that geography is no longer a limiting factor. Consequently, keynotes have the potential to reach new audiences. Speakers from the Global South, for example, might welcome the opportunity to be heard in North America.

What is the carbon footprint of such conferences? Just to clarify, it was not claimed that the May 2016 UCSB conference was carbon-*free*, just nearly so when compared to conventional ones. Consequently, its subtitle really has an implied second part, as this was "a nearly carbon-neutral conference (when compared to its traditional, fly-in counterparts)." Nonetheless, there is a real concern that streaming video, which was the

technology used for the conference talks, consumes a worrisome amount of energy.

The fact is that a staggering percentage of the energy that goes to running the Internet is used to send videos out to viewers. This is in large measure due to the fact that video takes much more bandwidth than, for example, text files. The average video file for one of the panel talks at the May 2016 conference was approximately 1 gigabyte (note that some are of 720p resolution, some 1080p). In contrast, if a talk took the form of a text file, it could be less than 100 kilobytes – i.e. ten thousand times smaller! Consequently, a text-only conference would have a much smaller carbon footprint. Of course, if talk files included images, sounds, or videos, they would grow significantly. Nonetheless, the point still fairly stands.

Just how much of the Internet is taken up by streaming video? According to the *Washington Post*, by 2020 “80 percent of the entire world’s Internet consumption will be dominated by video.[i]“ Netflix already accounts for “36.5 percent of all bandwidth consumed by North American Web users.”[ii] That’s a lot of movie and TV show watching. However, returning to the May 2016 UCSB conference, it used a relatively tiny amount of energy, mainly because the talks were not viewed nearly as much as other online video content. We know this because I carefully monitored how often the talk videos were watched.

For most panels, the talks were viewed around 2-4 times per day each. Not a great deal; however, the conference was open for 21 days. Thus, if we assume an average of 3 per day for the duration of the conference, we are looking at 63 views or so per panel talk.

In 2014, researchers at the Lawrence Berkeley National Laboratory (Berkeley Lab) considered just how much energy is required to stream video to viewers. Including the streaming source, transmission

pathway, access network, and equipment for playback and viewing. It is 7.9 megajoules (MJ) of energy per hour.[iii] In the process, 0.4 kg of CO_2 is emitted per hour. An average conference panel talk is approximately 15 minutes. Consequently, everything else being equal, each time such a talk is viewed 0.1 kg of CO_2 is released into the atmosphere. Let's assume that the above estimate of 63 views per talk is conservative (esp as people may continue to visit the website and view the talks after the conference is over) and increase it by 50% to round it off to 95 views, which would translate into 9.5 kg or 21 lbs of total CO_2 for each panel talk.

Now let's consider what the carbon footprint would be for a speaker flying to a conference, using the May 2016 UCSB event as an example. Since we know where each of the speakers would have needed to travel from to get to Santa Barbara, we were able to calculate that collectively they would have needed to fly just over 300,000 miles to get to and from our campus. Divide that by roughly 50 speakers and you have about 6,000 miles each. That's a lot, the equivalent of a round-trip flight from Los Angeles to New York. But keep in mind that this was a truly international conference with speakers from Canada, England, Europe, and a significant contingent from Australia (round-trip from Sydney to Santa Barbara is a whopping 16,000 miles). In any event, a round-trip, 6,000-mile flight releases roughly the equivalent of 2,000 pounds of CO_2 into the atmosphere.

Consequently, 95 views of a panel talk, which would cause 21 lbs of CO_2 to be released into the atmosphere, has about 1% of the carbon footprint of flying the speaker in for the talk. These are back-of-napkin calculations. Still, even if there are factors that we are failing to take into account and our 1% figure needs to be doubled or tripled, it still amounts to a very small percentage of the carbon footprint of a traditional conference.

True, there are other energy needs for a conference like this one, such as running the website and Q&A session. However, since the Q&A is text- rather than video-based, it is a rather small source of carbon emissions.

But also consider that a traditional conference's carbon footprint involves more than just air travel. Ground transportation to and from both the departing and arriving airport (four trips total) for each of the participants, catering, energy to heat and power the venue where the conference is taking place, as well as hotel rooms, and so forth all require GHG emissions. We are also only counting the speakers here. If all of the registered participants would have come to Santa Barbara, the total amount of CO2 released for air travel would have more than doubled.

Finally, since videoed talks are the backbone of the NCN conference approach detailed here, it is worth putting their viewing into perspective with other online video services. In 2016, the year that the first NCN conference took place, YouTube's most popular music video (*Gangnam Style* by the artist Psy) received more views than would all the talks for 625,000 conferences the size of the UCSB event. Approached another way, if every one of the roughly 5000 colleges and universities in the U.S. staged 125 such NCN conferences each, in total they would have the same carbon footprint as this single YouTube music video.

What is the environmental impact of the devices used? Electronic equipment, such as is needed to run a NCN conference, can have bewilderingly complex environmental costs. Consequently, if conference organizers required scholars to obtain specialized equipment for NCN conferences of this sort, they would in part be responsible for the environmental footprint of these devices.

Consider a related example. At some universities, instructors require students in large lectures to purchase a device called an i>clicker, which looks somewhat like a TV remote control and which allow students to

respond to multiple choice questions projected on the screen. Instructors use this device both to take attendance and to poll students during lecture.

In requiring students to purchase such a device, instructors need to realize that, although themselves small, these devices have a substantial environmental footprint, including the mining of the materials used in their making, the manufacturing process itself, the energy required to run the device, and dealing with it as e-waste, as well as perhaps dozens of disposable batteries required during its life. Not to mention the social costs and the conditions to which workers at all steps of its life are subjected.

However, in the case of NCN conferences, the situation is rather different. In this, the second half of the second decade of the 21st-century, every scholar on the planet should have access to some sort of computer or tablet device and reliable access to the Internet. This is absolutely a requirement. Although this is not the case everywhere, this is a wrong that needs to be righted. Since scholars are already (or at least should be) in possession or have access to this technology, only a relatively small portion of such a device's use and lifecycle needs to be devoted to NCN conferences.

Consequently, environmentally the best conference solution at the present seems to be some sort of NCN conference that makes use of our existing devices and networks. The worst solution, which is more problem than solution, is flying. Of course, we should do everything that we can to make sure that our various computers and devices are made, used, cycled (in the sense of having a long-life cycle before being replaced), and recycled responsibly. And that the energy sourced to power them and their networks is renewable whenever possible. Yet, they obviously can and should be part of our lives. If leveraged effectively, these devices, which many of us already possess, can bring about real gains,

such as more egalitarian, more accessible, more cost-efficient, and more environmentally sound conferences.

Can this model be adapted for talks and roundtables? Yes. Bringing in an individual speaker obviously has a much smaller carbon footprint than an entire conference; nonetheless, for some scholars, flying to give talks can nonetheless significantly contribute to their individual greenhouse gas emissions.

Fortunately, using a NCN approach for both talks and roundtables is straightforward—in fact, far simpler than staging a conference, as only a single webpage need be created for these events. Moreover, the page format is virtually identical for NCN conference panels, individual talks, and roundtables

In the case of roundtables, the same format used for a NCN conference panel (i.e. the same HTML) can be used, although in this case by adding additional speakers, assuming that there are more than three, rather than subtracting them for an individual speaker. In this instance, a two-tiered approach to the Q&A may be preferable, with the first week reserved for roundtable participants to interact with each other, followed by two weeks open to everyone.

Are breakout sessions possible in this approach? Breakout sessions are a staple of many traditional conferences, as they allow participants with similar interests to meet for extended discussions. The difficulty is that scheduling time for these sessions either makes for a longer conference or requires overlapping parallel sessions. With this NCN approach, breakout sessions can occur throughout a conference in at least two ways.

Because traditional Q&A sessions are short (generally just 15-20 minutes), breakout sessions are sometimes scheduled after panels to

allow for extended conversation. In contrast, the written Q&A sessions of NCN conferences are themselves breakout sessions of a sort insofar as individuals with shared interests have a place and time for extended interaction that can last for weeks.

In addition, separate breakout sessions can either be scheduled in advance of the conference or put together during the event. While the themes of these sessions can be related to one or more panels, they need not necessarily be so. This approach was first employed at the Oct/Nov 2016 UCSB conference. At this conference, which took place during the U.S. presidential election, a breakout session entitled “Making Sense of the 2016 Presidential Election” was hastily put together the day after the election. Opened by a brief (3-minute) talk by the conference coordinator (me), a conversation soon ensued with participants from a range of countries. By the close of the conference, over 16,000 words—the equivalent of more than 60 double-spaced pages—of lively discussion had occurred during the Q&A for this session. Given the success of this experiment, similar breakout sessions will be incorporated into future NCN conferences.

Is the archived presentation a talk or an article? In certain ways, a paradigm shift is taking place with talks of this sort. I am obviously not taking credit for this, as conference talks have been recorded in a variety of ways for some time now. Nonetheless, with this type of NCN conference, recorded talks now become central and required.

Traditional conference talks are for the most part a sort of ephemera. Unlike journal articles, they do not usually have material existence in print (or anywhere else, for that matter, other than in the notes from which they are given). Consequently, just a few hours after they are given, talks begin to fade in the memory of the audience. Within a few months, all that may remain in the minds of most might be the core idea and perhaps a few other tidbits, if that, and if remembered correctly. Of course, an

audience member can take notes; however, these rarely are cited in books or articles. Though it certainly may happen, it is a rarity.

With talks that are recorded and archived, this now changes. Arguably, they become more like journal articles than traditional conference talks on this count, as they can be quoted from with confidence and precision.

And yet, conference talks *are* different from journal articles precisely because we deliver them with the expectation that they will soon fade. We may even hope that they are eventually forgotten by everyone present. Not necessarily because we want to disown the ideas, but because we would rather that the world became acquainted with them in a more mature form in an article or book. And yet, with respect to the conference experience, they sometimes only reached that final written and archived form because of lively feedback that we received when first delivering them.

Conference coordinators could help try to make the talks more ephemeral by taking a SnapChat approach, erasing the talks and Q&A sessions when the conference concludes. However, because there would be plenty of time (three weeks in the case of the May 2016 UCSB conference) to pull quotes from the talks or copy Q&A comments, it is doubtful that this would be very effective.

Another option would be to give each speaker the option of having an emphatic “DO NOT CITE FROM THIS TALK” inserted under their talk’s video. This would help to ensure that it does not show up later in print. They could even request that its ideas not be paraphrased.

On the other hand, creating a lasting archive is important for reasons that have little to do with the primary motivation in conducting a conference such as this one, which is environmental. As noted above, a range of scholars across the globe do not have access to books and articles

because of the high cost of purchasing and subscribing to them, respectively, which can be beyond the ability of many institutions (and certainly individuals). The NCN conference archive short circuits all this, giving us all access to exciting new ideas at the moment when they first publicly see the light of day. It also creates a lasting archive of conference talks and Q&A discussion. If NCN conferences become common, services that aggregate information on them could grow as well. For example, the *MLA International Bibliography,* which maintains a database of journal articles, could do the same for conference talks. However, unlike many of the articles indexed by MLA that reside behind journal paywalls, conference talks would all be available free of charge to anyone with Internet access.

Finally, it is worth reflecting upon what we have always known: that conference talks contain inchoate ideas, which, when tested out on an audience, can prove to be incomplete and sometimes simply wrong. And one day perhaps even prove embarrassing. These are core features/risks of the genre. However, it seems clear that the primary reason that this genre of intellectual discourse exists at all is so that ideas can be improved upon by way of a critical audience. It might seem like it would be great to deliver a talk and receive nothing but praise, but, at the end of the day, it would substantively be an almost useless experience.

Will these talks "count" during promotion reviews? As with a traditional conference, for our pilot conferences we expended a great deal of effort jurying the talks. A majority of the submissions that were received were not accepted. In this sense, it was no different than a traditional conference.

There is, however, a difference in that the talks are permanently archived. With a conventional conference, the only information that a hiring or review committee generally has is the talk title and the venue. Consequently, if one were to give a talk and then spend the next three

days sightseeing, no one back home would likely know. However, if a committee is interested in doing so, with a conference of this new sort they can view the talk itself. Moreover, they can also assess total conference participation, as it is easy enough to check the Q&A sessions to see who is contributing, and how much and of what sort.

Given that this conference is unusual, it seems natural enough that a talk's inclusion on a CV or in a merit review might raise some questions, but it seems clear that it should certainly receive as much consideration as a traditional talk. If the situation were reversed, and the digitally archived conference was being challenged by a new face-to-face variety that left no material trace of the talk given or overall conference participation, it certainly might raise concerns. In this case, however, the opposite is occurring, as reviewing committees are now being given much more information for consideration.

Why are talks in video form but Q&As text-based? When putting the 2016 May UCSB together, I decided on a presentation approach with videoed talks and text-based Q&A sessions. The rationale was that it would feel more like a traditional conference if one could view the talks. Similarly, since online forums are common and allow multiple conversation threads to simultaneously take place, adapting one for the Q&A sessions seemed promising. Because we human beings generally read much faster than we speak, this also makes it quicker to scan through for questions of particular interest.

However, other permutations would certainly be possible. For example, the talks could be text-based with audio visual material embedded directly in the document. Alternately, the Q&A sessions could be largely video-based using services such as FlipGrid. Note that with either alternative, talks and Q&A sessions could take place over a period of weeks and would be asynchronous (which, as noted above, is a key feature of this conference approach)

In an effort to ascertain if the approach used at the pilot UCSB conference was well received, speakers were polled for their opinions after the event closed. They were first asked “Was the format of this conference, with videoed talks and text-based Q&A sessions, successful?” Of those that answered, 86.9% responded “yes,” 13.3% “not sure,” and 0% “no.” They were then asked “Would it have been preferable if the talks had been supplied as text (such as via PDFs) instead?” 100% of the respondents said “no.” Finally, “Would it have been preferable if the Q&A sessions had taken video form?” Similarly, 93% of the respondents said “no.”

While further experimentation with different approaches would be useful, it seems clear that videoed talks and text-based Q&A sessions are generally well received. In general, the traditional conference experience appears to be replicated reasonably well by this model. One of the speakers polled after the May 2016 UCSB event had this to say on the subject: “I think the conference combined the best features of recorded videos (potentially better rehearsed, more carefully scripted, and more polished than typical conference breakout session presentations) with the best features of an in-person conference (in particular, using a particular month in time to give a sense of being an event rather than merely a website with videos).”

Are transcripts of the talks available? As an experiment, unabridged transcripts of talks were made available for two of the panels at the Oct/Nov 2016 UCSB conference. These transcripts were timestamped in order to point to moments of potential interest in the videos. Because they were derived from the closed captioning created for the talks, the transcripts were faithful to the actual talk given, rather than notes that may have been used by the speaker. Since many speakers, especially those who use PowerPoints and similar presentations, are no longer

reading verbatim from prepared talks, this approach is arguably preferable.

Transcripts have obvious and significant advantages, as they can be quickly scanned to provide an overview of the talk. Moreover, as video files are huge by comparison—they can be more than ten thousand times larger than a talk transcript—reading rather than watching may be a welcome option if a fast Internet connection is not available. This could provide crucial access in parts of the developing world and elsewhere lacking fast connections. Note that, as the embedded video is not accessed until the “play” button is selected, just reading the transcript obviously uses far less energy than viewing the talk video and consequently is responsible for fewer greenhouse gas (GHG) emissions.

Providing a full transcript for each of the talks on the panel webpage has another advantage: this makes the talks visible to search engine crawlers, ensuring that the full text of a talk will be indexed by services like Google. A major shortcoming of online journals that keep articles behind paywalls is that, as they are not necessarily made accessible to such indexing, the text of the articles remains invisible to Google. Moreover, as these crawlers do not ordinarily index closed captioning text (at the time of this writing, Google does not index YouTube’s automatic closed captioning), the text of videoed talks is similarly inaccessible. In contrast, publically posting the full text of a talk to the conference webpage ensures that it can both be found by anyone and that they will be directed to a single page that contains video, transcript, and Q&A session.

Offering talks in two formats, as both a video and a written transcript, also promises to make them more engaging for a broader range of individuals. As one of the participants in the Oct/Nov 2016 UCSB conference noted, “It is good to be able to read the talk, and to skim it before deciding which one to watch and hear in its entirety. In teaching (and training future

educators), I constantly reiterate that different formats work better for different participants. So the greater the range offered, the greater the range engaged." Another noted that "I like having the transcript to refer back to—I think this encourages people to use the presentations in a more thoughtful way."

It is clear that transcripts proved popular at the Oct/Nov 2016 event. There is, however, the abovementioned concern that creating a lasting record (in the form of a video) of a talk makes it more akin to a journal article than a conference talk. Providing a transcript presumably makes it even more so. This is an inevitable consequence of an online conference of this sort that is arguably more advantage than shortcoming.

Note that YouTube, the video-streaming source for the Oct/Nov 2016 and subsequent conferences, automatically generated closed captioning for the above talks using voice recognition technology. Unfortunately, YouTube's software leaves much to be desired in terms of accuracy. However, as YouTube makes their closed captioning easily editable, most of the Oct/Nov 2016 conference speakers either personally edited their talk's closed captioning for accuracy or entrusted the job to someone else. Consequently, the transcripts were generally accurate and faithful to the talks given.

What form can the conference talks take? Although talks generally take a variety of forms, three in particular stand out:

1) *A video of the speaker delivering the talk*. These can be filmed with a computer webcam, a smartphone, a camcorder, or a DSLR camera with video capabilities. All of these devices can now record high definition video of near broadcast quality. Note that talks can be delivered anywhere (at home, in the office, a garden, etc.).

2) *A recording of a presentation, such as a PowerPoint*. Most computers have the ability to simultaneously record what is happening on screen, such as a PowerPoint or Prezi presentation, along with audio of the speaker as a voiceover. In this case, no camera is necessary, as the speaker never appears on screen.

3) *A combination of speaker and presentation*. In this approach, the speaker is alternately (or simultaneously in a small window) on screen with a presentation, such as a PowerPoint or Prezi. This is generally made possible by software that simultaneously records what is happening on screen along with the speaker delivering the talk through a webcam. Once both "tracks" are recorded, they can be edited into a video that either switches between the two or inserts one into the other as a small window.

In general, prerecorded talks allow for greater control over the presentation, as they can be edited before uploading. With a little ingenuity, they can provide provocative and engaging alternatives to the traditional conference talk.

Can this approach be used for "flash conferences"? Yes. In fact, this is one of the strengths of this approach.

As noted above, during the second UCSB pilot conference, which took place in Oct/Nov of 2016 and which took as its theme "The World in 2050," Donald J. Trump was elected President of the United States. Since this event changed the course of world history in a way that will arguably impact the world in 2050, the day after the election (as noted above) I posted a special panel on "Making Sense of the 2016 Presidential Election." It proved to be exceptionally popular.

This panel underscored the flexibility of an online approach such as our NCN model. Since a conference website can be authored in a day and

speakers can create videos of their talks using desktop or handheld equipment, an entire “flash conference” could have been up and running a day or two after the election. Compare this to traditional, fly-in conferences, which generally take months to coordinate.

Where are the avatars, virtual rooms, and 3D goggles? In a sense, this NCN conference model is based on yesterday’s technology, rather than tomorrow’s. It neither requires specialized equipment to produce the talks nor to watch them, such as a studio outfitted with a green screen to allow for shifting backdrops or 3D goggles. To the contrary, a decade-old computer or entry-level tablet or smartphone is all that is required. Consequently, there is no need to rush out to buy specialized hardware that may ultimately contribute to GHG emissions in its manufacture, use, and disposal. Similarly, the software used can all be free and open source.

It is also unclear what advantages many these technologies bring to the asynchronous NCN conference model explored in this document. Being able to interact in real-time with another person as an avatar in a 3D virtual world may be exciting and have other benefits, but it would be profoundly inconvenient if the parties were separated by a twelve-hour time difference. Alternately, prerecording a talk as a 3D avatar would seemingly have limited benefits.

Of course, the adoption of new technologies for NCN conferences should be considered as these become available and affordable for the majority of the world’s scholars.

Is this conference approach a form of social media? Yes, arguably it is. Consequently, this conference model has much in common with social media services (Facebook, Twitter, YouTube, Instagram, etc.), as these all involve the sharing of, as well as the ability to interact with, user-generated content. In the process, individuals are able to meet and

network online, usually by commenting on posted media. In the case of the NCN conference model explored here, the Q&A sessions allow for written discussion of user-generated videos of talks.

Like this NCN conference approach, social media services are generally also asynchronous. The extraordinary success of social media—Facebook, for example, has over two billion active users—is arguably in part due to this fact, as it allows individuals to interact at a time of their choosing, even if they happen to be in the same time zone or locale. Surprisingly, even though nearly half of Facebook friends live within 25 miles of their online friends,[iv] they do a good deal of interacting via this social media service, suggesting that many individuals prefer to interact asynchronously as well as in real-time.

In contrast, real-time online events, such as facilitated by Skype or GoToMeeting, are not social in the same way, as they largely seek to replicate face-to-face interaction (though generally seem to be perceived as coming up short in the process). In offering a viable, asynchronous alternative to traditional social interaction, rather than trying to simply mimic it, successful social media services facilitate what is in many ways a largely new type of social interaction. In other words, realizing that efforts at duplicating traditional, real-time social interaction online would likely come up short, social media services reimagined social interaction for the digital age.

Social media has helped to pave the way for this NCN conference approach, as it has normalized asynchronous online social interaction for billions of individuals worldwide. This is especially the case with the millennial generation that matured along with social media. The fact that this NCN conference model builds upon the familiarity that a great many individuals now have with social media should not only make the approach more accessible, but also contribute to its adoption.

Consequently, future NCN conferences may incorporate additional features borrowed from social media services.

Why is it important that conferences be global? At first glance, this NCN approach may not seem desirable for regional conferences, especially those focusing on local issues. For example, a conference on the topic of point-source pollution and environmental justice in the Southern United States may seem to be of little interest outside of the immediate area, especially as most of its speakers may hail from the region. Because a majority of participants would likely drive rather than fly, staging such an event as a live rather than NCN conference may thus seem preferable. Alternately, because most participants would come from just one or two time zones, staging it as a real-time teleconferenced event by way of a service like Zoom or GoToMeeting might also seem an appealing option.

However, the American experience with this particular issue, as well as the significant body of scholarship now surrounding it, may be of great interest to scholars in other regions of the globe now wrestling with similar problems. Not only may they be able to learn much from the conference, they may also have much to contribute because of their familiarity with similar issues in their own locale. The same can be said for many—arguably most—regional conferences.

Unfortunately, traditional conferences that offer only local speakers and which leave no trace behind in the form of an archive miss out on the opportunity to facilitate the sharing and discussion of ideas more broadly. Not only is the dissemination of ideas in such cases limited to a specific locale, discussion traditionally takes place among a small gathering of scholars behind closed doors.

Consequently, making talks and discussion equally available to scholars anywhere on the globe, even when the issue may seem local in scope, is a distinctly appealing idea.

Are the Q&A sessions a form of collective intelligence? While this NCN approach shares much with conventional conferences, its Q&A sessions allow for a level of discussion that is simply not possible with its traditional counterpart. Consequently, it is useful to consider what these sessions have in common with recent experiments in the online deployment of collective intelligence.

At the Oct/Nov 2016 UCSB conference, one of the Q&A sessions generated over 16,000 words (roughly 60 double-spaced pages) of discussion. Although lengthy, this does not capture the depth of what happened there, as the questions, answers, and comments were often more thoughtful than their spoken counterparts. As one of the Q&A's participants succinctly noted, "there's a depth to the Q&A here that I do not experience in 'normal' conferences."

This sort of depth is possible because this NCN approach to the Q&A session is making a shift from the spoken to written word. Consider the dialogue that one encounters in really good fiction. One of the joys of reading such a conversation comes from the fact that it is often just too good, with phrases and retorts chosen just too perfectly, to have been spoken in real-time. And it wasn't, as the author had the benefit of time in writing and revising it into a polished form. In transitioning from the spoken to written word in an online Q&A session taking place over multiple weeks, conference participants have the same luxury. Consequently, while it may read like the transcript of a spoken conversation (as does the dialogue in a novel), an NCN Q&A session is potentially more thoughtful and precise.

When such careful thinking and writing comes from a range of individuals and is focused on a particular issue, it is possible to collectively think through the matter at hand. While this sort of collective thinking is not new, and in fact occurs in a traditional Q&A session, this online approach extending over weeks greatly expands and enhances the process. To

understand how, it will be helpful to consider how online collective thinking has recently been deployed and explored.

Faced with a particularly difficult theorem, Cambridge mathematician Tim Gowers, a Fields Medal recipient, did something unusual in January of 2009. Instead of attempting to work through the problem himself, he posted a question to his popular personal blog: “Is massively collaborative mathematics possible?” “It seems to me that, at least in theory,” Gowers ventured, “a different model” than the traditional approach to problem solving “could work: different, that is, from the usual model of people working in isolation or collaborating with one or two others. Suppose one had a[n online] forum…The idea would be that anybody who had anything whatsoever to say about the problem could chip in.”[v]

Putting his theory to the test, Gowers posted the problem, the density Hales-Jewett theorem, to his blog, inviting anyone – professional mathematicians and laypeople alike – to help work through it. Almost immediately, a host of individuals, ranging from high school math teachers to other Fields Medalists, collectively weighed in on the problem. Working through the theorem step by step, ideas were proposed and discussed. Some were rejected, some accepted; often they were modified collectively. Six weeks and 170,000 words of online discussion later, not only had the original theorem been proved, but so was an even more difficult root problem of which this was only a special case. The findings were so significant that two scholarly articles were generated by the experiment.

Why did such a collective approach work? There are a number of reasons, but perhaps none more important than expertise. As is the case with many fields, mathematics is highly specialized. Consequently, when the collaborative mathematicians reached a potential impasse, it was sometimes the case that an individual contributor, who may well have

been wholly incapable of proving the theorem alone, was able to draw on esoteric expertise and interests to make the next incremental step. Bring enough of these specialists together from all over the world, which Gowers did online, and you have enough collective intelligence (as it is increasingly being called) to solve what no one individual, with only a single lifetime of accrued skill and knowledge, ever could.

Gowers's experiment is just one of many that have suggested to some thinkers, such as Michael Nielsen, that a paradigm shift in human intelligence is presently underway.[vi] Important discoveries, they argue, may increasingly not only come from lone geniuses, as they have traditionally, but also, as in the case of Gowers's experiment, from the collective intelligence of many. The claim of newness can, of course, be misleading, as scientists and scholars have always worked collectively. Albert Einstein, a particularly popular lone genius, had, in fact, reached an impasse somewhere around 1912 that kept him from generalizing special relativity. Fortunately, he had a friend, Marcel Grossmann, who mentored Einstein in his own esoteric specialty, non-Euclidean geometry, which provided the underlying mathematics that made general relativity possible. Whether through contact with friends, colleagues, and students, or through seemingly endless hours of solitary reading, we are always thinking with and through others.

But Gowers's experiment reveals that the times are indeed changing, especially with respect to scale, speed, and the underlying issue of authorship. Imagine if the collaborative mathematicians had worked together through the traditional journal format. Gowers would have submitted his opening thoughts on the theorem for publication. Assuming that referees judged the work important enough for publication (which may well not have been the case, as the density Hales-Jewett theorem is really not a very significant mathematical problem and Gowers offered just the beginning of a proof), it would have appeared in print in a year or

two. The process would have then started all over again with each of the subsequent contributors. Of course, personal conversations and correspondence can speed things up, but such a process is often slow, involving just a handful of players. Now, however, such collaboration, which can involve a startling range of far-flung specialists, can happen online at breathtaking speeds.

Is a similar deployment of collective intelligence possible in other fields? Theorists like Michael Nielsen are doubtful: “Think of criticism of English literature. Critics are not going to one day put down their quills and arrive at a common understanding of Shakespeare. Indeed,” Nielsen continues, “arriving at a common understanding isn’t the point. In such fields a plurality of views is a feature, not a bug, and a new way of understanding Shakespeare is to be celebrated.”[vii] While Nielsen is correct in arguing that a “plurality of views” is certainly crucial to literary criticism, he ignores the fact that such diverse perspectives ideally come together in a shared understanding of Shakespeare’s works. If a community of scholars generally accepts a new perspective on Shakespeare, our “common understanding” (to use Nielsen’s phrase), at first challenged, soon benefits. A quick look to the past few decades of Shakespeare scholarship reveals just how much our shared understanding has changed over the years.

Returning to the NCN Q&A session, it is implemented using the same technology (the robust collaborative commenting system at the core of WordPress) that Tim Gowers used for his original, as well as a range of subsequent, experiments in collective intelligence. Consequently, it has the many of the same advantages, some of which are explored in this document, of the approach used by Gowers, such as the ability to facilitate an extended, worldwide conversation among scholars separated by geography and time zones. The early implementation of this approach

at the UCSB events suggests that there is considerable potential for collective intelligence in this NCN approach.

The challenge, which will be addressed in future NCN events, is how to focus the intellectual energy of the experts that a typical conference brings together. Part of the reason that Gowers's experiment worked is because he focused the online community that he brought together on a specific problem. Similarly, the abovementioned Q&A session at the Oct/Nov 2016 UCSB conference that generated over 16,000 words of discussion was so active because it centered on a particular issue of timely interest to nearly all conference participants.

If a conference coordinators were to pose a single question, likely relating to the conference theme, that was interesting enough to entice a broad swathe of participants to engage in its discussion, contributors might very well collectively develop provocative answers to it in a shared Q&A session. Of course, multiple questions (each with its own Q&A session) could also be posed. In a sense, this is what each of the panels does insofar as they center on a shared interest. However, keeping overall focus on a single issue would seem less likely to fragment participation. Opening the event with an intentionally brief talk by the conference coordinators—the UCSB session's video was just three minutes—would help entice conference participants to look into what is going on.

There are, of course, no doubt other approaches to focus collective thinking at NCN conferences. One of the things that makes such events exciting is that they offer the opportunity to reinvent the traditional conference by the inclusion of features not previously possible, such as those designed to leverage the exciting potential of networked collective intelligence.

What about supplementing with real-time interaction? When asked for suggestions on how to improve this NCN model after the May 2016

UCSB conference, one of the speakers noted that “I think more focus should be made on having regional/national hubs.” Another asked, “What if there were a 24-hour video café feature, where people could hang out (and schedule times to hangout together as they’d like) to talk in real time?”

Because the May 2016 UCSB event was imagined as primarily asynchronous in nature, real-time interaction was not a major focus (with the exception of a real-time closing event). However, while videoconferencing obviously does not replicate face-to-face interaction, it is potentially a meaningful way to interact. In order to explore the usefulness of such discussion in a conference setting, at the Oct/Nov 2016 UCSB conference I created “NCN Salons” where participants could casually interact in real-time using a Skype-like technology. The challenge involved scheduling, as participants were in a range of different time zones. The solution was to create three separate global NCN Salons.

Most of the world can be divided into three blocks comprising six or seven time-zones. An example would be the Americas, as 4 p.m. in Brazil (the most eastern part of the two continents) is 10 a.m. in Alaska. Consequently, a one-hour NCN Salon opened from 10-11 a.m. in Alaska / 4-5 p.m. in Brazil would be reasonably convenient for most of the Americas. A second such block includes Europe, Africa, and the Middle East. A third Russia, Asia, and Australia. All three of these time blocks were well represented by speakers at the Oct/Nov 2016 UCSB conference.

The idea was to open, via a real-time video conferencing service, three one-hour NCN Salons where, in the words of the above speaker, “people could hang out” and interact casually, perhaps scheduling times to meet. As this speaker further noted, “this would have an added benefit of not leaving a permanent record. I would have availed myself of such a

feature.” Participants were free to visit NCN Salons outside of their regions if the inconvenience of the time difference was accepted.

Unfortunately, as with many events of this sort using real-time video conferencing technology, the results were in many respects disappointing. There were two primary issues: 1) Some participants had difficulty negotiating the software, such as turning on their audio and video feeds. Some never even succeeded at logging in. 2) Poor Internet connections ultimately forced more than half of the participants to turn off their video and take part with audio only. The second issue was by far the most problematic.

Real-time video conferencing may work well in a university or corporate setting where a reliable and fast Internet connection can be counted upon. However, as our participants from across the globe were for the most part logging in from their homes, connections were far less reliable.

Somewhat paradoxically, conference goers generally did not appear to have nearly as much difficulty watching the prerecorded videoed talks, even though they were in many cases of a higher resolution than the feeds for the video conference. The reason has to do with the fact that video services like YouTube and Vimeo typically buffer their video streams (usually by approximately 30 seconds) so that a few seconds of lagging Internet connection goes completely unnoticed. Unfortunately, as a real-time video feed by definition cannot be buffered, the repeated presence of such lags can disrupt a real-time event.

What is the solution to this problem? As time goes on and Internet connections across the globe become faster and more reliable, NCN Salons could perhaps become more rewarding experiences. Alternately, participants could ensure that they already have such an Internet connection, perhaps in their university offices.

Why isn't the academic rank of participants noted? In one of the Q&A sessions of the Oct/Nov UCSB conference a participant noted that "It is a relief to be free of the power dynamic that often lies just below the surface in the academic Q&A." In putting together this model I debated whether to have speakers sign in with their academic rank or position (i.e. "Ken Hiltner, _____, UC Santa Barbara," with the blank filled with "Professor," "Ph.D. Candidate," "Lecturer," etc.). I decided to drop the titles in the hope of making conferences of this sort more egalitarian, which in a variety of ways was one of my central goals. Unless you happen to know the person (or go to the trouble of looking up their bio), a comment can thus be judged on its merit, rather than its author's position or rank.

It is also the case that some people are simply a little reticent in certain social situations. As the above NCN conference participant noted, "Many of us are uncomfortable speaking in a roomful of strangers, but are happy to post something in writing. I've found this to be a pleasant surprise about the format here." In general, many of us have had the experience of wanting to ask a question at a conference but felt reluctant to do so, esp as some Q&A participants sometimes speak with intimidating authority. Unasked, the question stayed with us, becoming more developed and refined. After an hour or two of taking form, we might regret not having asked it when we had the opportunity. At a conference of this sort, such an opportunity doesn't slip away in even a day or two.

How might a university help support this approach? This NCN conference approach asks speakers to do something unusual: produce a video of a conference talk. While recording a talk with a webcam or making a screen recording of a presentation such as a PowerPoint can be relatively simple, it can sometimes be a challenge. Producing a hybrid video that switches back and forth from speaker to presentation can be even more so. Moreover, even though the quality of the videos that

webcams can produce has improved dramatically in recent years, they still fall far short of professional equipment, such as high definition DSLR cameras capable of extended video recording.

Many universities fund travel for faculty. Ideally, a small portion of these resources could be redirected to provide modest video production capabilities. Some institutions already have facilities that could be adapted for the purpose. If not, a repurposed classroom with a podium would be all that is needed. If so desired, the room could be adequately sized for a small audience of interested friends, students, and colleagues who could help energize a talk. The equipment required (a high definition digital camera, podium microphone, adequate lighting, data projector, laptop computer, etc.) would likely cost less than providing funding for four or five faculty members to attend a single national or international conference. A student or staff technician with modest training and experience could operate the equipment.

In this approach, the speaker would deliver the talk to either the technician or small audience. A video switcher would allow the presenter's PowerPoint (or other presentation method) to be simultaneously captured along with a video of the speaker. The technician could, in real-time, create a videoed talk that switched back and forth from speaker to presentation. A few minutes after the talk was finished, it could already be uploaded to a server for streaming. Such archived videos can easily be embedded in a conference webpage. A copy of the videoed talks could also be archived by the university for safekeeping.

Alternately, the university could dedicate a server for the purpose and itself become the streaming source. This could be particularly appealing option if the server was powered by renewable energy. This would also create the opportunity to centrally archive and index all of the talks made by a university's faculty. Along with the videos, the archive could also

contain the text of the Q&A session that it generated. If the Q&As exist as HTML, as do the sessions for the pilot UCSB conferences, they could simply be saved to a blank webpage.

Such a modest facility could produce 20-30 talks per week (i.e. a thousand or more per year) at a fraction of the cost that colleges and universities have traditionally provided for faculty conference travel, accommodations, meals, and so forth.

What about greenhouse gases other than CO2? The carbon dioxide released for fly-in conferences contributes to climate change more than any other source. However, other greenhouse gases are also emitted for such events. For example, jet airliners release oxides of nitrogen (NOx) into the upper atmosphere where they form ozone, which contributes to global warming. Similarly, catering and dinners for conferences, especially where beef is served, are responsible for the release of methane.

Consequently, it would be more accurate to refer to the conferences described here as “nearly free of greenhouse gas emissions” rather than “nearly carbon-neutral.” However, while “greenhouse gas emissions” may one day replace “carbon” as the preferred term in the popular imagination (so that, for example, we would refer to our footprint of greenhouse gas emissions or simply “climate footprint” rather than our carbon footprint), this has not yet happened. Consequently, I provisionally used the moniker “NCN conferences,” even though by this I mean all sorts of events (including individuals that fly in to give talks, roundtables, etc) that are nearly free of greenhouse gas emissions.

Why should we tackle this particular issue? After all, there are plenty of other things that we can do to help mitigate climate change. However, if there is one thing that we scholars, either individually or institutionally, can do to make the biggest difference, this is clearly it.

Let’s start by considering this issue as an institutional one, again using UCSB as an example. As noted above, approximately one third of UCSB’s total GHG emissions currently comes from air travel to conferences, talks, and meetings. Before considering these emissions directly, let’s consider the other two thirds and what can be done about them.

The total GHG emissions from the electricity that UCSB purchases is, coincidentally, just about equal to those that come from air travel: roughly 55,000,000 pounds annually. The University of California system (UC) is deeply committed to reducing emissions from purchased electricity. For this to happen, the State of California’s current energy infrastructure needs to be completely revamped. California is already one of the leaders in the nation in this effort, as 30% of its electricity came from renewables in 2017. The long-term goal is 50% by 2030.[viii] Many billions of dollars will be spent in this effort, as this entails nothing less than a transition out of a fossil fuel economy and into one that instead has renewables as its backbone.

Following behind GHG emissions that come from air travel and electricity are those that come from the combustion of fossil fuels on the UCSB campus, principally for heat and cooking. This is annually responsible for roughly 38,000,000 pounds of CO2 or equivalent gasses. Currently, roughly 75% of the UC’s power supply comes from natural gas.[ix] This is especially disturbing as the majority of natural gas in the U.S. is obtained from the environmentally disastrous practice of hydraulic fracturing (fracking).[x] The UC hopes to both become more efficient in its natural gas use and to replace it with biogas.[xi] However, as noted above, biogas may present more environmental problems than it solves. With respect to greater efficiency, UCSB has long been committed to this goal. Its Bren Hall was both the first building in the nation to receive a LEED (Leadership in Energy & Environmental Design) rating of “Platinum” by

the Green Building Council, as well as the first to receive a second Platinum LEED award for its operations and maintenance. However, only so much energy can reasonably be saved.

With a sustained, concerted effort, the two thirds of UCSB's GHG emissions that do not come from air travel (i.e. purchased electricity, stationary combustion, and a range of smaller emission sources) could perhaps be cut in half in the upcoming decades. The UC is in fact committed to doing this sooner; however, in order to do so it will have to purchase both renewable electricity and biogas from limited supplies in the state. This is in no way a solution that every institution and individual in California could enact, as there is simply not nearly enough renewable electricity and biogas to go around.

By contrast, the third of UCSB's total GHG emissions that come from air travel is indeed very low-hanging fruit, as we are in a position—right now—to reduce this by a factor of 100. This will not cost billions of dollars. In fact, significant funds could be saved in the process, as NCN conferences cost less than their traditional counterparts.

The story is similar if this issue is approached from a personal perspective. As noted above, climate scientist Peter Kalmus was able to reduce his GHG emissions by two thirds simply by giving up air travel. Not all scholars travel this much; however, as noted above, if we assume the equivalent of three transcontinental flights per year factored by an average American's carbon footprint, we are back to the one third figure.

These numbers will obviously vary across institutions and individuals; nonetheless, eliminating (or greatly reducing) academic air travel represents an extraordinary opportunity to simply and easily—relatively speaking, especially in relation to other concerns, such as natural gas and electricity use—to dramatically reduce GHG emissions. For many institutions and individuals, it can reduce GHG emissions by a third. Of

course, we should also do everything else that we can, such as the programs being enacted by the UC and elsewhere, to halve the other two thirds. If we succeeded at both, we would be at a third of where we started.

Why should we tackle this particular issue? It is simply the fastest and easiest way for our profession to help mitigate climate change. No other technological innovation or shift in cultural practices can come close by a long shot.

Is the Time Right for NCN Conferences? Given the significant environmental and cultural advantages that can come with such an approach, it seems likely that most conferences in 2040 or 2050 will largely take place online. The fact that an online approach can both reduce a conference's GHG emissions by a factor of a thousand or more while also allowing a range of individuals who would not otherwise be able to attend—because of issues relating to cost, geography, time zones, accessibility, and so forth—full access to the proceedings argues strongly for the adoption of such an approach.

However, it is unclear that the time is right for such an approach now. When I teach *Silent Spring*, students often astutely observe that Carson's message was well timed. Had she delivered it ten years prior, in the early 1950s, it may well have gone largely ignored. In the case of an online conference approach, there is little doubt that the technology is now available to make it possible. As is noted above, by 2020, half of the world's population will personally have the ability to produce and watch high-definition videos of broadcast-quality—thanks to the astonishing proliferation of smartphones. Moreover, as a broad array of social-media services have proven, desktop, laptop, and mobile devices are already facilitating online social interaction for billions of individuals.

But is the time right for the online conference? Given the optimism surrounding the COP21, it may be the case that we are, to adapt a phrase used by Bill McKibben in his keynote address for the second UCSB pilot NCN conference, ready to “walk the talk” and immediately do more to mitigate our global GHG emissions. Moreover, given that traditional, fly-in conferences are our profession’s single largest source of GHG emissions, it may be the case that academia will lead the way on this count. Let’s hope.

Has the time come to adopt the online conference? Perhaps a better and more useful question is to ask what needs to be done to make such conferences ready for widespread adoption. Or, even better, us ready for them. In other words, are we prepared to abandon a longstanding cultural practice for an altogether new alternative? As with most cultural changes, inertia may well dictate the kneejerk response. However, given that a new generation of individuals are now living a broad swath of their lives online, we may well be prepared for it—or at least may be in the process of being prepared for this new take on an old practice.

Why are we waiting? In January of 2008, just three months after it was announced that Al Gore and 1500 scientists jointly received the Nobel Peace Prize for their work on climate change, *The Chronicle of Higher Education* published an opinion piece with the pithy title “Academic Travel Causes Global Warming.”[xii] It was written by Mark Pedelty, an associate professor of journalism and mass communication at the University of Minnesota-Twin Cities. In just a few hundred words, Pedelty drew attention to both the scope of the problem and possible solutions. He began by noting how air travel for a single conference can have a carbon footprint greater than 10,000 people in India for all aspects of their lives for a year. But he did more than just outline the issue, he considered alternatives by describing an online talk that “demonstrated how rich and useful videoconferencing could be if conducted on a larger

scale. Distance educators have discovered the potential of videoconferencing, and so should the rest of academe."

Although Pedelty did a commendable job of succinctly bringing this problem and its potential solution to the attention of the *Chronicle's* many readers, little has been done to address this issue in the years since its publication.

Why is this the case? Although there are a range of reasons, three in particular stand out:

1) Many scholars are simply not aware of the problem or its scope. The *Chronicle* never published a follow-up article and there has been little coverage elsewhere. Consequently, nearly all UCSB faculty who I informed that one third of the campus's total GHG emissions came from air travel to conferences, talks, and meetings were shocked by the fact. On a personal note, they were often equally distressed to learn that a third or more of their personal GHG emissions may come from academic air travel. Although it reached a large audience, Pedelty's message seems to have been largely forgotten.

2) Teleconferencing technology is frankly disappointing. Although many scholars have attended talks coordinated via Skype, GoToMeeting, and Google Hangouts, it is very likely that the experience was not rewarding, especially when compared to face-to-face talks. Consequently, in the minds of many scholars, an entire conference using this technology would not likely be very successful.

3) Many scholars are concerned about the loss of direct human contact that is integral to traditional conferences (see above).

Taken together, these three issues offer a reason for why we are waiting, as many scholars are not aware of the enormous scope of the problem or

are doubtful that digital technology can offer an adequate alternative, especially to direct human contact.

The NCN conference approach advocated for in this book attempts to address these issues by fostering greater awareness of the issue through what I believe is a viable alternative, which, among other advantages, provides for abundant and productive interpersonal contact. Importantly, this model can be implemented now, using a globally installed base of technology.

This is, of course, not the only model possible. Consequently, I very much welcome alternate approaches. In fact, an ideal scenario would be if a range of groups and individuals dedicated themselves to this problem. Enormous amounts of time and funding have been devoted to, for example, digitally sharing photographs and snippets of thoughts online (Instagram, Twitter, etc.). If just a fraction of this energy could be applied to the pressing issue of conference travel, we could keep many billions of pounds of greenhouse gases from being released into the upper atmosphere each year.

If, instead of conference travel, we were taking up the issue of flying for other purposes, such as vacations and family visits, it is unclear just how such a problem might be best approached. Certainly eliminating frivolous travel, such as the “getaway weekend,” would be a start, but even this would likely meet strong resistance. Consequently, we would be waiting for some sort of solution not yet offered to the problem. However, with respect to conference travel, there is no need to wait, as NCN approaches already have the potential to actually deliver a superior academic conference experience than their traditional, fly-in counterparts.

Why are we waiting? Many scholars are either unaware of the scope of the problem or how easily it can be solved. With this in mind, an immediate course of action (which in the one advocated for in this book)

is to stage NCN conferences in order to draw attention to academia's air-travel problem while simultaneously offering a viable alternative.

[i] https://www.washingtonpost.com/news/the-switch/wp/2015/05/27/in-5-years-80-percent-of-the-whole-internet-will-be-online-video

[ii] https://www.washingtonpost.com/news/the-switch/wp/2015/05/28/netflix-now-accounts-for-almost-37-percent-of-our-internet-traffic

[iii] http://newscenter.lbl.gov/2014/06/02/berkeley-lab-study-highlights-growing-energy-impact-of-internet-video-streaming

[iv] http://blog.bozuko.com/2012/01/25/new-data-more-than-45-of-your-customers-facebook-friends-live-within-shopping-distance-of-your-business/

[v] http://gowers.wordpress.com/2009/01/27/is-massively-collaborative-mathematics-possible/

[vi] (see Nielsen's *Reinventing Discovery: The New Era of Networked Science*, pages 1-11, 209-13)

[vii] Ibid, 76.

[viii] http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable

[ix] http://ucop.edu/sustainability/_files/carbon-neutrality2025.pdf

[x] http://blogs.wsj.com/corporate-intelligence/2015/04/01/how-much-u-s-oil-and-gas-comes-from-fracking

[xi] http://ucop.edu/sustainability/_files/carbon-neutrality2025.pdf

[xii] http://chronicle.com/article/Academic-Travel…/45937

PRACTICAL GUIDE

Introduction

Taken as a whole, the UCSB May 2016 experience revealed that coordinating a NCN conference was arguably much simpler (and certainly less expensive) than a traditional, fly-in event, especially as there is no need to coordinate air and ground transportation, hotel accommodations, catering, venue and audio-visual setup, conference dinners, and so forth. It does, however, require a modicum of digital expertise.

Consequentially, what follows is somewhat technical. If you are familiar with self-hosted WordPress installations and embedded streaming video services such as YouTube, this will likely seem straightforward. If not, it would probably be useful to enlist someone to help who has such familiarity. Because WordPress makes it relatively simple to create a website, this need not necessarily be someone with formal training or technical credentials. Ask around; many students, both graduate and undergrads, have the necessary skillset.

Incidentally, if you send us your CFP, we will do what we can to help promote your NCN conference.

Website

Content Management System

The May 2016 UCSB conference website ran on WordPress, which is a content management system (CMS) that is now used by nearly 60% of all websites worldwide that disclose their CMSs. One of the major

advantages that WordPress brings to the table is its robust commenting features, a holdover from its origins as a blogging platform, that are simple to adapt for online Q&A sessions. WordPress is also relatively straightforward to use, as well as to extend by way of plugins (see below). Note that this should be a self-hosted WordPress installation, as WordPress.com does not generally allow the installation of plugins. Other platforms, such as Drupal, could certainly be used, but it is arguably far easier to build a conference with WordPress. As noted above, a conference could be incorporated into an existing website, as was done with the UCSB May 2016 event.

Visual Theme

While WordPress is itself a robust website engine, it needs to have a "theme" installed on top of its backend to make it user accessible. The UCSB May 2016 event used a commercially available theme named "Enfold," which was modified for the purpose. However, there are range of free themes that would work, such as the 20xx themes by WordPress.org (i.e. Twenty Seventeen). Any modern WordPress theme should be "responsive," meaning that it should make the website as accessible on mobile devices as it is on desktop and laptop computers.

The broad range of themes available for WordPress installations is potentially a significant advantage here, as it allows conference websites to take on a variety of appearances, as well as functionality.

Plugins

One of advantages of the WordPress platform is that it can be extended by way of "plugins." The UCSB May 2016 conference used four. The first is essential, the other three helpful. The fifth, which is also optional, was added for the Oct-Nov 2016 conference.

1) Subscribe to Comments Reloaded. This plugin allows participants to be notified via email whenever a question, answer, or comment is posted to a particular Q&A. Because the email notification contains the new comment in its entirety, it allows participants to both follow the discussion as it is unfolding, as well as decide whether they would like to step in at any point. By way of this plugin, participants can choose to receive email notifications for as many of the conference Q&A sessions as they like, as well as stop notifications at any time.

2) Remove Nofollow. In an effort to reduce spam, WordPress inserts the “Nofollow” attribute to keep comments from containing online links. Unfortunately, this means that legitimate users who would like to embed links in their comments are barred from doing so. This plugin removes that restriction. Because this NCN conference approach requires individuals to register before posting comments (see below), spam is generally not a major danger in this case.

3) Easy Social Share Buttons In order to leverage social media coverage of the conference, this plugin generates a message (such as a tweet) containing information of your choosing about the conference or particular panel. See our sample page for this plugin in operation. Many similar plugins are available, some of them at no cost. You might also consider creating a hashtag for the conference.

4) Soon for WordPress. In order to make the conference feel like an event, prior to its opening a timer is inserted near the top of the landing page to count down to the opening day. Once the conference is started, it is used to count down to its closing. See our sample page for this plugin in operation. While this particular plugin offers a range of countdown options, no cost options are also available.

5) RegistrationMagic. Having participants register both reduces spam and allows their institutional affiliation to be displayed along with their name when they take part in Q&A sessions (institutional affiliation is added to the “nickname” field of WordPress user data). While registration can be manually done for each conference participant (which was the method used for the May 2016 conference), this plugin automates the process.

Recording the Talks

(Note that some of this material is also included in the sample acceptance email below.)

The May 2016 UCSB conference provided two brief videos with tips on how best to film and upload talks. Please feel free to direct speakers to these. Although viewing them only takes a few minutes, they offer helpful tips to walk speakers through the filming process. The first of the two videos explains how to use an external webcam (which is preferable to the webcams that come with most computers – see below) to film the speakers giving the talk. The second explains how to make a screen recording of a PowerPoint or Prezi presentation accompanied by the speaker’s voiceover. Either of these is a perfectly acceptable alternative for a conference talk.

Some speakers may, however, be interested in going a step further by producing a video that merges the webcam video of them speaking with a screen recording of their PowerPoint or Prezi presentation (or movie clips, live shots of a website, etc). If they are interested in this approach, on the same webpage that has the above two talks there is an introductory video to a software product called ScreenFlow. Please note that there are many such programs available and that we are in no way endorsing this particular product. It is, however, a powerful yet relatively simple tool that allows users to simultaneously record the webcam video of them talking

and a video of whatever is happening on their computer screen, such as a PowerPoint or Prezi presentation. It then allows them to edit the two so that they can produce a video that switches back and forth between them.

Using a program such as ScreenFlow might be an appealing option for some individuals; however, not everyone may want to tackle the learning curve of a new piece of software (moreover, ScreenFlow is not free, although there are similar software options that are). This is perfectly understandable. As noted above, a simple webcam talk or screen recording of a presentation is perfectly fine.

Regarding format, the video file should either be an .mp4 or .mov. The resolution should be 720p (i.e. 720 x 1,280 pixels) or 1080p (1080 x 1,920). Anything higher, such as 2k or 4k resolution, is unnecessary. One of the reasons that we are suggesting using an external webcam (which is outlined in the abovementioned video) is that many of the webcams that come with computers do not offer resolutions this high. Apple's newest MacBook, for example, only offers 480p resolution (640 × 480). Because even 720p offers three times the pixels of 480p, and 1080p provides nearly seven times as many, using an external webcam will generally result in a far superior video. One of the reasons that Skype talks often look grainy is that they are shot with low-resolution webcams. If speakers use a relatively new external webcam it will most likely record at 720p or 1080p. Moreover, most video recording programs that come preinstalled on computers, like Apple's Quicktime, will automatically save the video as either a .mp4 or .mov file.

Another option is to have speakers film their talks using a smartphone, which often have included apps for video recording and high-resolution cameras of excellent quality (usually of better quality than the webcams included with most laptop computers). Because smartphones take a relatively small amount of energy to run, even when compared to an energy efficient laptop, such an approach to video recording will have a

very small carbon footprint. Note that it is preferable that the smartphone be positioned horizontally so that the video orientation is landscape rather than portrait. Also, note that many smartphones have two cameras: one facing the user and one outward facing, the latter generally being by far the better quality of the two and hence the one to use. Employing an inexpensive tripod mount, with perhaps someone to assist the speaker, may be desirable.

If the idea of recording the talk seems a little daunting to speakers, they might consider getting someone to help. Many academic departments have students, both graduate and undergrads, who are surprisingly computer/technology savvy. Some may even have their own video cameras and editing software. It might be worth having speakers ask around to find such a person.

Video Streaming Source

Choice of Streaming Service

Although it is possible to stream videos directly from a WordPress website, services such as YouTube and Vimeo are generally preferable, as they maintain robust server networks that ensure uninterrupted viewing – even if a range of individuals across the globe are viewing the same talk at the same time.

We have experimented with two video streaming services for our NCN conference approach: Vimeo for the May 2016 UCSB conference and YouTube for the 2016 Oct/Nov conference. Here are sample panels using each: Vimeo, YouTube.

We have concluded that YouTube is preferable for a number of reasons:

1) YouTube is free. In contrast, the required Vimeo Pro account for a conference costs $199 or $399 per year, depending on type.

2) YouTube, by way of its parent company Google, is making an effort to use sustainably produced electricity, efficient data centers, and to recycle their e-waste. As Vimeo does not at the time of this writing have transparent sustainability policies, it is unclear if (and seems unlikely that) they are implementing any such policies.

3) YouTube uses voice recognition software to automatically generate closed captioning. While the accuracy of this service is by no means perfect, it nonetheless guarantees that all conference talks are closed captioned for deaf or hard-of-hearing individuals. Moreover, speakers can manually add improved closed captioning, ensuring its accuracy. Although closed captioning can be added to videos uploaded to Vimeo (see below), as this must be done by each speaker (or someone entrusted with the job), there is no assurance that this will happen with all or even most talks, unless conference coordinators take this job upon themselves.

4) YouTube has an incredibly robust global server network, with local versions of the service in more than 80 countries.

If the “direct approach” to using YouTube outlined below is used, there are two additional advantages:

5) Speakers can upload their talks directly to YouTube. As this is not possible with Vimeo, and because videoed talks are generally too large to email, they must first be uploaded to a cloud source, such as Dropbox, which charges $99 per year for a Pro account, before they can be uploaded to Vimeo.

6) Because a second cloud service (such as Dropbox) is not required for file transfer, using a unified approach like YouTube, which skips a transfer/storage step, should result in energy savings.

For these reasons, we recommend using YouTube as a conference streaming source. However, since Vimeo is a viable option that has been proven to work, we have also included information here on its use.

YouTube

There are two approaches to using YouTube as a streaming source.

1) The direct approach:

This approach, which was used for the 2016 Oct/Nov UCSB conference, is simplest as it allows speakers to directly upload their talks to YouTube. Consequently, it does not require video files to first be uploaded to a cloud source such as Dropbox, which adds complexity and expense to the process. In order to upload their talks, speakers must first create their own YouTube accounts (which are cost-free). Using the process outlined below, all talks are then aggregated together on a YouTube conference playlist.

A particular feature (which can be seen as either a drawback or advantage) of this approach is that speakers can take down their own YouTube talks at any time, either during the conference or after. If conference coordinators desire to create a lasting archive of the event, this may not be desirable. In the second YouTube approach outlined below, video files are transferred to the conference coordinators, who then upload them to a single conference YouTube account. If desired, a

separate conference archive can also be created (see below). However, if a speaker requests that his or her talk be removed from the conference website and archive, conference coordinators may nonetheless wish to honor this request. If speakers have not signed a release transferring rights, they may well be legally bound to honor such a request.

Because we imagine that the overwhelming majority of speakers will not take down their talks (and we did not want to be in a position where we might have to contest them doing so), we employed this approach for the 2016 Oct/Nov UCSB conference.

The following steps are necessary for this “direct approach”:

A) Create a YouTube account and conference playlist.

B) Open the conference playlist and under “playlist settings/collaborate” select this option: “Collaborators can add videos to this playlist.” This will generate a link that will allow collaborators (i.e. conference speakers) to add their videos to your conference playlist.

C) Share the above link with your conference speakers.

D) Once speakers have created their own accounts and uploaded their talks to YouTube, the video ID numbers can be swapped into the embed codes in your conference panel webpages (see sample panel HTML). Make sure that speakers have verified their accounts so that videos longer than 15 minutes can be uploaded (info).

E) As noted above, YouTube will automatically create closed captioning shortly after a talk is uploaded. However, for

more accurate captioning, it is desirable to have speakers (or someone that they entrust with the job) manually enter the closed captioning. YouTube provides detailed instruction on how to do this on their page on community-contributed subtitles and closed captions. Note that speakers must add this closed captioning directly to the talk in their personal YouTube account.

2) The archive approach:

If conference coordinators desire to have all talk videos uploaded to their own conference YouTube account, this approach can be employed.

A) Create a Dropbox Pro or similar cloud account. Once speakers have recorded their talks, they will need to get them to you so that you can upload them to YouTube. Because the video file will likely be too large to email, using a cloud service such as Dropbox is necessary. Given the size and quantity of videos, a Dropbox Pro account ($99 per year) is needed. Aside from the cost issue, this can be a very time-consuming process.

B) Create a conference Dropbox folder and give each speaker access to it.

C) Create a YouTube account and conference playlist.

D) Once speakers have uploaded their talks to the Dropbox folder, upload the files from this folder to your YouTube account.

E) Once the talks have been uploaded to YouTube, the video ID numbers can be swapped into the embed codes in

your conference panel webpages (see sample panel HTML).

F) As noted above, YouTube provides automatic closed captioning that can subsequently be improved upon.

Vimeo

The following steps are needed to use Vimeo as a conference video streaming source:

1) As with the above approach, first create a Dropbox Pro account. While other services could be used, an advantage of a Dropbox Pro account is that they have partnered with Vimeo to allow video files to be automatically uploaded to their service. As the video files will generally be over 1 gigabyte in size, this eliminates a time-consuming step.

2) Create a conference Dropbox folder and give each speaker access to it.

3) Create a Vimeo Pro account and conference collection. As is noted above, such an account costs $199 or $399 per year, depending on type.

4) Once speakers have uploaded their talks to the Dropbox folder, upload the files to your Vimeo collection.

5) Once the talks have been uploaded to Vimeo, the video ID numbers can be swapped into the embed codes in your conference panel webpages (see sample panel HTML).

6) Because Vimeo does not employ voice recognition software to automatically generate closed captioning, a third-party solution must be used, such as Amara, which provides free closed

captioning software that allows anyone to caption videos. Because it does not generally require a steep learning curve, Amara can be relatively quickly learned by speakers and student interns. Like Dropbox, Amara has partnered with Vimeo to simplify integrating the two, which makes captioning videoed talks, both for greater accessibility and to translate into additional languages, relatively simple. See our sample page for a video embed from Vimeo that is captioned in four languages by Amara.

Audio Podcasts

Using a service such as SoundCloud can make conference talks available as audio podcasts, which makes them easy to listen to on the go. More importantly, a SoundCloud conference playlist can bring all of the talks together in one relatively convenient place for blind or visually impaired individuals. Offering the talks as audio podcasts has potential environmental advantages as well, as audio files take far less storage and bandwidth than video. Moreover, audio podcasts are generally played on mobile devices with relatively small energy requirements. SoundCloud podcasts are available on their website, as well as through free iOS and Android apps for mobile devices.

It would be ideal if YouTube would provide the option to only stream audio, as video uses approximately 10 to 20 times more bandwidth – and obviously requires significantly more energy. However, YouTube does not presently offer this type of functionality, seemingly because they do not want viewers to listen without watching ads. (YouTube Red, a paid service, does allow subscribers to listen to YouTube videos on mobile devices without video, but it is likely that the data stream still includes video.) Consequently, a separate podcast service, such as SoundCloud, may be the best option at this time.

Unfortunately, creating and uploading SoundCloud podcasts is time-consuming and adds expense. Here are the steps:

1) Create a SoundCloud Pro Unlimited account ($135 per year) and conference playlist. Note that this account could be used for multiple conferences.

2) Download each of the talks from either your YouTube or Dropbox account as MP4 files.

3) Convert each of the talks from an MP4 video file to an MP3 audio file either using video editing software or a service such as Zamzar.

4) Upload each talk to the SoundCloud conference playlist.

5) If desired, create a conference webpage for podcasts (here is an example).

Closed Captioning

As noted above, both YouTube and Vimeo have provisions for closed captioning. Although having captions automatically generate by YouTube's voice recognition software is appealing, the ideal solution is to have speakers (or someone that they employ) manually add the captioning. Because it was unclear if speakers would be willing to take the time to add this accessibility feature, speakers from the May 2016 UCSB conference where polled after the event for their feelings on the matter: 87.5% of those that responded answered "yes" when asked "would you (or someone that you entrusted with the job) be willing to use Amara to add closed captioning to your talk?" Consequently, the best course of action at the present may be to ask participants if they would be willing to closed caption their own talk.

Talk Transcripts

As noted above, we hope to include talk transcripts at all future NCN conferences (sample). These transcripts are directly derived from YouTube's closed captioning scripts for its videos. To access these scripts, simply go to a YouTube video and under "More" select "Transcript." It is then a simple matter to cut and paste the script into a panel's webpage.

The closed captioning that YouTube automatically creates using its voice recognition technology leaves much to be desired in terms of accuracy. Fortunately, YouTube makes it editable, making it easy to correct for errors that creep in. In order to see how this works, we have created a short (5-minute) video to walk speakers through this very straightforward process. It can be accessed here. Please do consider encouraging this editing, as it not only creates an accurate transcript, but ensures quality closed captioning for those that rely on it.

Note that it is preferable to have the full transcripts on the panel webpage, as the transcript and videoed talk will be indexed together by the search engines employed by Google and Bing. In other words, if a Google search reveals text from a promising paper, ideally the user should be sent to the page that has the text of the talk along with the video and Q&A session. Uploading the transcript as a separate file, such as a PDF, would keep this from happening.

In order to have a text box sufficiently wide to keep the closed captioning from awkwardly wrapping lines, the panel page layout needs to be changed from three fourths of the page devoted to the video embed and one fourth to the text on the right to instead be two thirds and one third, respectively. On our sample page, we converted the text to the right of the video to a scrolling box.

Video Archive

Although both YouTube and Vimeo should archive the conference talks for as long as the account is active (assuming the secondYouTube “archive approach” outlined above is used), it may be desirable to download and archive the MP4 files to a RAID 1 server maintained by a university in order to create a backup archive.

Conference Registration

The Q&A sessions for the May 2016 UCSB conference employed the powerful commenting features of WordPress. Because archived Q&A sessions may well be cited by scholars, it is necessary to correctly attribute the statement to the individual that made it. Consequently, each participant at the conference registered by supplying his or her name, email address, and institution affiliation on an online form. Email address and affiliation were individually confirmed before registering individuals at the conference, thereby helping to ensure that proper attribution of comments could be made. In order to differentiate the Q&A session from a typical online forum, no avatars were displayed. Registered participants were given WordPress “subscriber” status on the conference website a day or two before the conference opened. As is noted above, the RegistrationMagic plugin may be used to automate the registration process.

Academic conferences are not generally open to the public. Although it sometimes happens that a non specialist wanders into a talk, this is more exception than rule. After much deliberation, it was decided that, while the talks and Q&A sessions would be available for the public to view at the May 2016 UCSB conference, only students and faculty (i.e. anyone with a current .edu email account or who could demonstrate that they were currently a student or faculty member of a university or similar institution) should be able to take part in the Q&A. Other conference coordinators may, of course, decide differently. In order to test the

necessity of this approach, the Oct-Nov 2016 UCSB conference removed this requirement.

Appendices

Sample CFP

(After introducing the conference theme, the following material could be inserted. Feel free to copy and adapt any of this sample CFP.)

Please note that our goal is to – as much as possible – have a nearly carbon-neutral conference. Even a relatively small academic conference can generate the equivalent of 20,000 pounds or more of CO2 (chiefly from travel). To put that number in perspective, this is the total annual carbon footprint of ten people living in India, thirty-three in Kenya. We believe that a conference that takes up the issue of climate change while simultaneously contributing to the problem to such a degree is simply unconscionable.

Consequently, this conference will largely occur online. During the conference, which will take place over three weeks, talks will be available for viewing on the conference website. Q&A will also take place online during this period, as participants and registered attendees will be able to pose questions to speakers via online comments and speakers will be able to reply in the same way. Both the talks and Q&A sessions will remain up on the website as a permanent archive of the event.

Note that a conference using this format was staged at UC Santa Barbara in May of 2016. As that conference's website contains a complete archive of the event, please visit it if you have questions relating to how this conference will work. In particular, the opening remarks and the accompanying Q&A session help explain the rationale for this approach while also demonstrating it.

While we realize that this approach will not replicate the face-to-face interaction of a conventional conference talk and Q&A, we hope that it will nonetheless promote lively discussion, as well as help build a community of scholars with intersecting research interests. An advantage to this approach is that individuals who would not otherwise be able to become involved in the conference (owing to distance, financial limitations, and so forth) will be able to fully take part. There will be no registration fee for the conference. Although this online conference will have its own carbon footprint, as data centers and web activity also require energy, we expect that it will only be a small fraction of that of a conventional conference, likely just 1-3%.

Instead of traveling to the conference to attend panels and deliver a talk, speakers agree to do the following:

1) Film yourself giving a talk of 15-17 minutes. The webcams that come with desktop and laptop computers have improved dramatically over the past few years. Aftermarket webcams with noise cancelling microphones, which can be purchased for under $50, can often provide even better quality. It is also the case that most computers have video recording software preinstalled, such as Apple's QuickTime, Consequently, it is now possible, and relatively easy, to record a talk of surprisingly good quality in your home or office. How easy is it and how good is the quality? A sample talk that explains the concept and process in detail can be found here: http://ehc.english.ucsb.edu/?p=12048.

2) Take part in your online Q&A session by responding to questions raised by your talk. You will automatically receive an email each time a new question is posed. Only registered conference participants (this includes speakers, as well as others who register for the conference) will be posing questions.

3) View as many of the talks as possible, posing questions of your own to speakers. This is especially important, as this is how you will meet and interact with other conference participants. As with any academic conference, our goal is help establish relationships and to build a community. In this case, since travel has been removed from the equation, our hope is that this community will be diverse and truly global.

Abstracts of 250 words and a brief biographical note should be submitted by _____to _____. While we welcome international submissions, the talks should either itself be in English or subtitled (see below) in English. The Q&A will be in English. You should also note that you have viewed the sample video and agree both to the above conference requirements and to allow your filmed talk to be posted to the conference website, as well as our Vimeo, YouTube, and SoundCloud accounts. As noted above, the talks will become part of a permanent conference archive open to the public.

Amara provides free closed captioning software that allows anyone to caption videos. As they note on their website, Amara makes it possible "(and free) to caption and translate your videos…Amara is built by a nonprofit, 501c3 organization. We are driven by the mission to reduce barriers to communication and foster a more democratic media ecosystem." Because it does not require a steep learning curve, Amara can generally be quickly learned. Since our goal is to have a conference that is accessible as possible, please consider using Amara to add closed captioning to your talk or have someone (perhaps a student intern) do it for you. If you will not be able to closed caption your talk, please note this when submitting your abstract.

Abstracts are due by _____.

Participants will be informed if their submissions have been accepted by _____.

Videos of the talks will be due by _____.

The online conference will take place from _____ (generally, this should be a three-week period).

Please send any questions to _____.

Sample acceptance email with conference conditions

(Feel free to copy and adapt any of this sample email.)

Dear _____,

I am delighted to inform you that your proposal has been accepted for _____, our nearly carbon-neutral conference.

The next step will be for you to film your talk and get it to us by _____ (the sooner the better, as this will give us more time to work out any technical difficulties).

Apologies in advance for the lengthy email that follows, but we want to make sure to adequately detail how this unusual process and conference will work.

There are two brief videos with tips on how best to film and upload your talk available online from a previous conference of this type. You can watch them at http://ehc.english.ucsb.edu/?page_id=12523. Please do spend a few minutes viewing them (they are very short), as they should offer some helpful tips to walk you through the filming process. The first of the two videos explains how to use an external webcam (which is preferable to the webcams that come with most computers – see below) to film yourself giving the talk. The second explains how to make a screen recording of a PowerPoint or Prezi presentation

accompanied by your voiceover. Either of these is a perfectly acceptable alternative for your talk video.

You may, however, be interested in going a step further by producing a video that merges the webcam video of you talking with a screen recording of your PowerPoint or Prezi presentation (or movie clips, live shots of a website, etc). If you are interested in this approach, on the same webpage that has the above two talks we have included an introductory video to a software product called ScreenFlow. Please note that there are many such programs available and that we are in no way endorsing this particular product. It is, however, a powerful yet relatively simple tool that allows you to simultaneously record the webcam video of you talking and a video of whatever is happening on your computer screen, such as a PowerPoint or Prezi presentation. It then allows you to edit the two so that you can produce a video that switches back and forth between them as you like.

Using a program such as ScreenFlow might be an appealing option for some individuals; however, we realize that not everyone will want to tackle the learning curve of a new piece of software. Moreover, ScreenFlow is not free (although there are similar software options that are). This is perfectly understandable. As noted above, a simple webcam talk or screen recording of a presentation is perfectly fine.

Regarding format, your video file should either be an .mp4 or .mov. The resolution should be 720p (i.e. 720 x 1,280 pixels) or 1080p (1080 x 1,920). Anything higher, such as 4k resolution, is unnecessary. One of the reasons that we are suggesting using an external webcam (which is outlined in the abovementioned video) is that many of the webcams that come with computers do not offer resolutions this high. Apple's newest MacBook, for example, only offers 480p resolution (640 × 480). Because even 720p offers three times the pixels of 480p, and 1080p provides nearly seven times as many, using an external webcam will

generally result in a far superior video. One of the reasons that Skype talks often look so grainy is that they are shot with low-resolution webcams. Don’t worry if all this seems technical and a little confusing. If you use a relatively new external webcam it will most likely record at 720p or 1080p. Moreover, most video recording programs that come preinstalled on computers, like Apple’s Quicktime, will automatically save the video as either a .mp4 or .mov file. Please confirm that your video is either 720p or 1080p.

Another option is to film your talk using a smartphone, which generally come with apps for video recording and high-resolution cameras of excellent quality. Note that most smartphones have two cameras: one facing the user and one outward facing, the latter usually being the better quality of the two and hence the one to use. Employing a smartphone on an inexpensive tripod mount, with perhaps someone to assist you, is a very real option – and, as smartphones take a very small amount of energy to run, even when compared to an energy efficient laptop, this would translate to a tiny carbon footprint for the filming process.

If the idea of recording your talk seems a little daunting, you might consider getting someone to help. If your department is like ours, there are many students, both graduate and undergrads, who are surprisingly computer/technology savvy. Some may even have their own webcams and editing software. It might be worth asking around to find such a person.

Once you have recorded your talk, you will need to get it to us. Because your video file will likely be too large to email, we will send you access information for a Dropbox folder. Once you upload your video to Dropbox (which is a simple process), we will take it from there, transferring it to our Vimeo account and streaming from there to the conference website.

The conference talks will be available at three separate places online. Why three? Each has its own advantages, especially as one of our goals is to make the conference as accessible as possible to a variety of variously abled individuals.

1) *The Conference Website* will likely be the most convenient place to view the talks for most people, as the balance of the conference material will reside there along with the talks. Moreover, and importantly, the Q&A will only take place at the conference website.

2) *Vimeo* is our primary cloud repository for videos. The talks on the conference website will be streaming from this service. Because Vimeo maintains a robust server network, this ensures uninterrupted viewing – even if a range of individuals across the globe are viewing the same talk at the same time. Finally, Vimeo provides for a pleasant high-definition and ad-free experience.

3) *SoundCloud* makes the talks available as audio podcasts, which makes them easy to listen to on the go. More importantly, our SoundCloud conference playlist will bring all of the talks together in one relatively convenient place for blind or visually impaired individuals. The SoundCloud podcasts will be available on their website, as well as through their free apps for mobile devices.

Given that some conference goers may be visually impaired and hence will not be able to see the talk, it is a good practice to briefly explain what is on screen if you are using a PowerPoint, Prezi, or some other type of presentation. This is something that you may well already do somewhat automatically. For example, you might say, “The next image is of…” or “As we can see by the inclusion of _____ in the lower right of the screen…” Similarly, given that some viewers will be reading lips, try to enunciate clearly whenever possible when onscreen.

Note that the talks will actually reside in just two of the above three places, as the conference website only streams the talks from Vimeo. While the talks reside in two places, energy is primarily expended only when the talks are accessed. Consequently, having the talks in two places does not increase the total carbon footprint by a similar factor. Moreover, offering the talks as audio podcasts on SoundCloud means that they take far less storage and bandwidth than a video. Additionally, audio podcasts are generally played on mobile devices with tiny energy requirements. Finally, even though the talks will be archived in two places online, our carbon footprint should be far, far less than a typical fly-in conference.

In sending us your video, you agree to have it posted to the above three places. We plan on leaving the talks up on the above sites, where they will be viewable by the public, with no plans on taking them down in the near future. In sending us your video, you agree to allow it to remain up on the above websites. Also note that, since the videos will be viewable by the public, you should have permission or rights to use any material that you show in your video.

Please encourage your colleagues and students to participate in the conference! If they go to this page _____ and supply us with their name and email address, we will give them access to the Q&A sessions. As a speaker, you will automatically be given complete access to all the Q&A sessions. A day or two in advance of the online conference beginning, you should receive access privileges directly from WordPress (if you do not, check your spam folder).

The online conference will take place from _____ (generally, this should be a three-week period).

Please send any questions to _____.

Apologies again for this long email. we just wanted to answer as many questions in advance as possible. However, if you have more, feel free to send them to us directly at the below email address.

Looking forward to seeing you at the conference!

Sample email explaining conference registration

(Feel free to copy and adapt any of this sample email.)

HI Everyone,

In the next day or so, you should receive access privileges directly from WordPress (if you do not, check your spam folder) that will allow you to take part in the Q&A sessions for any and all panels. Each of the speakers is encouraged to help start off their particular Q&A session with a brief comment. Nothing fancy, a short statement noting that you would like feedback is just fine. Alternately, you could elaborate on your objectives, bring up questions that still remain in your mind, explain where you hope to go next with the idea, and so forth. It is entirely up to you. A benefit of making such an opening statement is that, when posting it, you will have the option of selecting “Notify me of followup comments via e-mail.” If selected, you will be notified via email whenever a question, answer, or comment is posted to your particular Q&A session (and only your Q&A, though you also have the option to subscribe to any sessions to which you make a comment). Because the email notification will contain the new comment in its entirety, as well as a direct link to your panel, you can both follow the discussion as it is unfolding, as well as decide whether you would like to step in at any point. Since the conference website is optimized for mobile devices, you could even respond directly from a smartphone. You can choose to stop these email notifications at any time. Because the Q&A sessions

will close at the end of the conference, all email notifications will also end at this time.

Thanks!

Panel HTML

Each conference panel usually contains from 2-4 speakers with a shared Q&A session. An HTML template is included here for creating a panel (i.e. a WordPress “post”) on the conference website. Note that this is a post with “Allow comments” enabled, rather than a page. Feel free to modify it as desired. You need not, of course, use this template, but it may help simplify creating a post. Note that it includes short code for the easy-share buttons plugin and modified embed code for Vimeo. This is for a full-width (i.e. 960px+) post without sidebar. For Youtube, click here for a sample post using this HTML; here to view and copy HTML. For Vimeo, click here for post using this HTML; here to view HTML. Please note that the HTML for YouTube and Vimeo are not interchangeable, though feel free to customize either.

Acknowledgements

Both the May and Nov/Dec 2016 UCSB conferences emerged out of a yearlong campus focus on “Climate Futures” that was jointly coordinated by UCSB’s Environmental Humanities Initiative (EHI) and its Critical Issues in America series. As a consequence, it owes its existence to the members of the EHI faculty Board (Peter Alagona, John Foran, Ken Hiltner, Jeff Hoelle, Tess Shewry, Janet Walker, and Volker Welter) and the co-conveners of the Critical Issues Series (John Foran and Ken Hiltner), as well as the hard work put in by UCSB students Tom Doran, Rick Thomas, Chris Walker, and Natasha Tandler. And, of course, it would have never taken place without the over 100 intrepid speakers who took part in these unusual events.