AEESP Converging COVID-19, environment, health, & equity conference

Session 6 Transcript – November 20, 2020

WELCOME, EVERYONE.
WE WILL BE STARTING MOMENTARILY.
GOOD MORNING.
GOOD AFTERNOON OR GOOD EVENING, DEPENDING ON WHEN YOU ARE WATCHING THIS.
WELCOME TO OUR SIXTH AND FINAL SESSION OF THE AEESP ASSOCIATION OF ENVIRONMENTAL ENGINEERING AND SCIENCE PROFESSORS CONVERGING COVID-19 ENVIRONMENT HEALTH AND EQUITY.
THIS IS OUR LAST SESSION AS I SAID.
THE THEME IS COVID-19 AND CLIMATE CHANGE MITIGATION AND ADAPTATION.
WE HAVE A GREAT SET OF PANELISTS AND A MODERATOR TODAY.
BEFORE THAT I WOULD LIKE TO GO THROUGH SOME LOGISTICS.
JUST A DISCLAIMER THIS WEBINAR WILL BE RECORDED.
BY CONTINUING TO VIEW THIS WEBINAR YOU ARE CONSENTING TO BEING RECORDED.
MY NAME IS COLLEEN NAUGHTON I'M AN ASSISTANT PROFESSOR IN CIVIL AND ENVIRONMENTAL ENGINEERING AT THE UNIVERSITY OF CALIFORNIA, AND A CO-ASSISTANT ON THIS NATIONAL CONFERENCE --
AND THESE ARE ZOOM WEBINAR INSTRUCTIONS.
SO ON THE RIGHT-HAND SIDE YOU CAN GO TO SIDE-BY-SIDE GALLERY VIEW SO YOU CAN SEE THE SIGN LANGUAGE INTERPRETER.
YOU MAY ALSO HAVE A DIFFERENT PANEL.
OR A WAY TO GET TO SIDE BY SIDE MODE.
SO JUST CLICK ON VIEW OPTIONS AT THE TOP OF YOUR SCREEN SO THAT YOU CAN SEE THE SPEAKERS AND THE INTERPRETER.
WE ALSO HAVE CLOSED CAPTIONING.
SO IF ON THE AT THE BOTTOM YOUR SCREEN YOU NEED THE SERVICE YOU CAN SEE.
IT AND THERE'S A WAY TO SUBMIT QUESTIONS AND ANSWERS AT THE BOTTOM.
YOU MAY ALSO SUBMIT QUESTIONS OR ANSWERS TO THE G MAIL OR TO THE #AEESP CONVERGING COVID-19.
THIS IS OUR LAST SESSION.
SO I JUST WANT TO THANK -- IN ADDITION AS YOU HAVE SEEN MYSELF AND DR. MAYA TROTZ, BUT TO OUR ORGANIZING COMMITTEE.
HEATHER HOPKINS IS A PROGRAMS COORDINATOR FOR STRONG COAST AT THE UNIVERSITY OF SOUTH FLORIDA, AND OUR STUDENTS MISTELL LAWSON AND ASHLEY OSTER AND BROOKLYN JAMES IS AT UNIVERSITY OF WEST -- AND THANKS TO THE CLOSED CAPTIONERS AND WORKERS AND INTERPRETERS DURING THESE CLOSED SESSIONS.
I WILL NOW INTRODUCE A VIDEO OF THE CONFERENCE.
[¶¶¶]
IT IS MY HONOR NOW TO PRESENT THE MODERATOR FOR TODAY'S SESSION.

DR. LILIA ABRON.
SHE IS CEO AND PRESIDENT AND FOUNDER OF PEER CONSULTANTS.
SHE IS A TRAILBLAZER, A HISTORY MAKER AND AN ENTREPRENEUR.
SHE IS THE FIRST AFRICAN-AMERICAN WOMAN IN THE NATION TO EARN A PH.D. IN CHEMICAL ENGINEERING AND
THE FIRST AFRICAN-AMERICAN TO START AN ENGINEERING CONSULTING FIRM FOCUSED ON ENVIRONMENT AND ENVIRONMENTAL ISSUES.
DR. ABRON IS A NATIONAL ACADEMY OF ENGINEERING MEMBER.
AN NAE MEMBER.
SHE IS PRESIDENT-ELECT OF THE AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERING AND SCIENTISTS.
AAEES.
AND AN AEESP LEGACY MEMBER.
SO PLEASE JOIN ME IN WELCOMING OUR MODERATOR DR. ABRON.
>> GOOD MORNING, DR. NAUGHTON.
THANK YOU VERY MUCH FOR THAT VERY KIND AND GRANDOS INTRODUCTION.
THANK YOU ALL FOR MEETING US HERE TODAY FOR THE SIXTH OF THE SIX SESSIONS.
AND THIS ONE IS ON COVID-19, CLIMATE CHANGE MITIGATION AND ADAPTATION.
OUR PANELISTS TODAY WILL BE PRESENTING CO-GENT IDEAS AND PERSPECTIVES ON CLIMATE CHANGE AND MITIGATION IN A WORLD WHERE HONESTLY, WE ARE BEYOND BEING ABLE TO MITIGATE CLIMATE CHANGE.
THE EARTH IS GETTING HOTTER.
AND HUMANS ON THIS PLANET ARE LARGELY TO BLAME.
WE SHOULD NOT ABANDON THE STRATEGIES THAT WILL HELP CURVE CLIMATE CHANGE SUCH AS ENERGY EFFICIENCY, ADVANCING ALTERNATIVE ENERGY SOURCES, ADVANCING CLIMATE INTERVENTION STRATEGIES AND REDUCING GREENHOUSE GASES AS DESCRIBED IN THE REPORT THAT THIS WORKSHOP IS BASED ON.
BUT WE SHOULD ALSO BEGIN TO THINK STRATEGICALLY ABOUT MASS MIGRATIONS TO THE U.S. INTERIORS BECAUSE OF CLIMATE CHANGE.
USING SYSTEM THINKING APPROACHES TO IDENTIFY POTENTIAL OUTCOMES AND SOLUTIONS IN REALTIME.
I THINK MASS MIGRATIONS TO THE INTERIOR OF THE U.S. HAVE ALREADY BEGUN.
AND WHILE INITIALLY, THEY WERE NOT CLIMATE CHANGE DRIVEN, CLIMATE CHANGE IS NOW BECOMING THE MAJOR DRIVER.
THESE MIGRATIONS MUST BE ANTICIPATED, UNDERSTOOD AND PLANNED FOR.
I AM THE PRODUCT OF THE OUTCOME OF ALREADY TWO MASS MIGRATIONS.
ONE NOT DESIRED.
BUT IT HAPPENED.
AND THAT IS THE FORCED MIGRATION OF THE AFRICANS FROM THE AFRICAN CONTINENT, STARTING IN THE EARLY 1600S AND BEFORE.
THIS MASS MIGRATION RESULTED IN A FOURTH OF THE POPULATION OF THE AFRICAN CONTINENT BEING TRANSPORTED ALL OVER THE WORLD.
THE UNINTENDED CONSEQUENCES OF THAT MIGRATION ARE STILL BEING RESOLVED TO THIS DATE.
THE SECONDED MASS MIGRATION, TERMED "THE GREAT MIGRATION" WAS THE SELF-IMPOSED RELOCATION OF MORE THAN 6 MILLION AFRICAN-AMERICANS FROM THE RURAL SOUTH TO THE U.S. CITIES OF THE NORTH, MID-WEST AND WEST FROM ABOUT 1916 TO 1979.
THE UNINTENDED CONSEQUENCES OF THAT MIGRATION ARE MAJOR REASONS FOR THE CONTINUING CIVIL AND POLITICAL UPHEAVAL IN THE U.S. TODAY.

PRESIDENT OBAMA IN A 2016 PRESIDENTIAL MEMORANDUM "CLIMATE CHANGE AND NATIONAL SECURITY" POINTING OUT THE RELATIONSHIP BETWEEN CLIMATE CHANGE AND MIGRATION WITH UNINTENDED CONSEQUENCES OF POLITICAL AND CIVIL INSTABILITY.
HE DIRECTED FEDERAL AGENCIES TO PERFORM CERTAIN FUNCTIONS TO ENSURE THAT CLIMATE CHANGE RELATED IMPACTS ARE FULLY CONSIDERED IN THE DEVELOPMENT OF NATIONAL SECURITY DOCTRINE, PLANS AND POLICIES.
BY BREAKING CLIMATE CHANGE DOWN INTO ITS COMPONENT GEO PHYSICAL SYMPTOMS THE MEMO MAKES A STRONG CASE FOR TREATING IT AS A THREAT MULTIPLIER, WITH THE POTENTIAL TO PUSH VULNERABLE STATES PAST THE TIPPING POINT INTO CHAOS.
EXTENDED DRAUGHT, MORE FREQUENT AND SEVERE WEATHER EVENTS, HEAT WAVES, WARMING AND ACIDIFYING LEVELS AND RISING SEA LEVELS ALL HAVE COMPOUNDING EFFECTS ON PEOPLE'S HEALTH AND WELL-BEING.
FLOODING AND WATER SCARCITY CAN NEGATIVELY AFFECT FOOD AND ENERGY PRODUCTION.
ENERGY INFRASTRUCTURE, ESSENTIAL FOR SUPPORTING OTHER KEY SECTORS, IS ALREADY VULNERABLE TO EXTREME WEATHER, AND MAY BE FURTHER COMPROMISED.
OTHER CONCERNS ARE TRANSPORTATION DISRUPTIONS, PEST OUTBREAKS, THE SPREAD OF INVASIVE SPECIES, AND DISEASE.
ALL OF THESE CAN LEAD TO POPULATION MIGRATION WITHIN AND ACROSS BORDERS, SPUR CRISIS AND AMPLIFY OR ACCELERATE CONFLICT IN COUNTRIES OR REGIONS ALREADY FACING INSTABILITY AND FRAGILITY.
THE MASS MIGRATION IN THE U.S. TO ITS NORTH, SOUTH, EAST AND WEST CLOSEBY INTERIORS HAS BEGUN.
AND IT IS INCUMBENT UPON ENVIRONMENTAL ENGINEERS TO PUT THEMSELVES CLEARLY ON THE FOREFRONT OF DEVELOPING AND IMPLEMENTING STRATEGIES TO ADAPT TO CLIMATE CHANGE IN PLACE, AND TO WORK COLLABORATIVELY IN MULTI-DISCIPLINARITY TEAMS, UTILIZING SYSTEMS THINKING APPROACHES TO PROVIDE SOLUTIONS TO RESPONDING TO A CHANGING PLANET CAUSED BY A CHANGING CLIMATE.
NOW LET'S TURN OUR ATTENTION TO OUR SIXTH SESSION.
COVID-19 AND CLIMATE CHANGE MITIGATION AND ADAPTATION.
OUR FIRST SPEAKER, DR. SIBYL DERRIBLE.
DR. SYBIL DERRIBLE IS AN ASSOCIATE PROFESSOR OF CIVIL AND MATERIALS ENGINEERING AND THE UNIVERSITY HE CHICAGO AND COLLEGE OF ENGINEERING AND A RESEARCH ASSOCIATE PROFESSOR HE IS INSTITUTE FOR ENVIRONMENTAL SCIENCE AND POLICY AT UIC.
HE IS THE CO-ARTHUR OF A RECENT BOOK,"URBAN INFRASTRUCTURE:
REFLECTS FOR 2100."
DR. DERRIBLE.
>> HELLO, THANK YOU VERY MUCH, DR. ABRON.
I HAVE THE GOOSE BUMPS.
YOUR SPEECH WAS AMAZING.
THANK YOU VERY MUCH.
WHAT I WILL DO NOW IS I WILL TELL YOU A LITTLE BIT ABOUT A PROJECT THAT WE HAVE HAD WITH UIC AND THE STATEMENT OF UNIVERSITY SINCE APRIL.
AND IT'S ABOUT SURVEYS PEOPLE IN THE UNITED STATES ABOUT HOW THEY HAVE BEEN AFFECTED TO COVID-19 WITH A FOCUS ON TRAVEL BEHAVIOR.
WE ARE ALL TRANSPORTATION PEOPLE.
SO WE ARE NOT MEDICAL PEOPLE.
BUT WE ARE ASKING THEM ABOUT THEIR HABITS, HOW THEY HAVE CHANGED AND THEIR ATTITUDES, HOW THEY HAVE CHANGED.
NEXT SLIDE, PLEASE.

SO WE CAN LEARN MORE -- BY THE WAY YOU CAN LEARN MORE AT COVIDFUTURE.ORG.
THE SURVEY INCLUDES SEVEN SECONDS, EMPLOYMENT AND WORKING AND STUDYING AND SHOPPING AND DINING AND DAILY TRANSPORT AND ATTITUDES AND DEMOGRAPHICS AND SOCIAL NETWORK.
WE HAVE DONE EXTENSIVE WORK.
WE HAVE CLOSE TO 9,000 RESPONSES.
WE ARE PLANNING ON HAVING THREE WAVES.
WE HAVE COMPLETED WAVE ONE.
AND NOW WE WANT TO SEE WHETHER THE CHANGES THAT WERE MEASURED IN WAVE ONE PERSIST OVER TIME.
PEOPLE KEEP ADAPTING THE BEHAVIOR.
AND WE WANT TO THE SEE WHAT PERSISTS AND WHAT DOES NOT PERSIST.
WE JUST FINISHED A COLLECTION OF THE DATA.
UNFORTUNATELY WE HAVE NOT ANALYZED DATA THOROUGHLY.
SO I WILL PRESENT TO YOU SOME OVERALL TRENDS THAT WE HAVE SEEN, BUT THERE'S MUCH, MUCH MORE IN THE DATA ITSELF.
WE WILL DO SOME ANALYSIS OURSELVES BUT THE DATA WILL ALSO BE MADE COMPLETELY AVAILABLE TO EVERYONE.
IT IS PART OF THE UNIVERSITY FUNDING FROM THE UNITED STATES NATIONAL STATES FOUNDATION AND FROM THE U.S. DEPARTMENT OF TRANSPORTATION.
SO ALL OF THE DATA WILL BE RELEASED.
YOU WILL ALL HAVE ACCESS TO IT.
SO RIGHT NOW THE NS ARE VERY LIMITED.
I APOLOGIZE IN ADVANCE.
NEXT SLIDE, PLEASE.
THE FIRST THING THAT WE WILL SEE IS LONG DISTANCE AIR TRAVEL IS BEING IMPACTED SEVERELY.
RIGHT NOW, OF COURSE, NOT MANY PEOPLE ARE USING IT.
BUT EVEN IN THE FUTURE WITH HOW EASY IT IS TO USE ZOOM, WHAT WE ARE DOING NOW, PEOPLE -- A LOT OF PEOPLE THINK THAT THEY WON'T TRAVEL AS MUCH IN THE FUTURE.
SO THAT'S PROBABLY THE BIGGEST SECTOR THAT HAS BEEN AFFECTED.
NEXT SLIDE, PLEASE.
THE SECOND ONE IS ABOUT THE WORKING FROM HOME.
SO THE ONE ON THE -- THE FIGURE ON THE LEFT SHOWS BEFORE THE PANDEMIC.
YOU CAN SEE A BIG SLIDE.
WHICH IS THE NUMBER OF TIMES THAT PEOPLE COMMUTE PER WEEK.
SO FIVE WAS NOTICEABLY THE LARGEST ONE BEFORE THE PANDEMIC.
AND DURING THE PANDEMIC A LARGER PORTION OF THOSE FIVE DAYS PER WEEK HAVE SWITCHED TO ZERO.
SO A LOT OF PEOPLE DON'T COMMUTE ANY MORE.
THEY JUST WORK FROM HOME.
NEXT SLIDE, PLEASE.
AND WHEN WE LOOKING AT WHO HAS THE ABILITY TO WORK FROM HOME, AND WHO DOESN'T, WHAT WE CAN SEE IS -- SO YOU CAN SEE ON THE TWO PANELS ON THE LEFT-HAND SIDE ARE OTHERS AND THE TWO UNDER -- RIGHT INSIDE THE LOW INCOME HOUSEHOLDS.
AND WE HAVE BEFORE AND AFTER.
AND WHAT WE SEE IS FOR LOW INCOME HOUSEHOLDS THE PROPORTION OF HOUSEHOLDS WHO HAVE BEEN ABLE TO SWITCH FROM WORKING IN PLACE AT THEIR WORK TO WORKING FROM HOME IS NOT AS MUCH.
WHICH MEANS THAT PEOPLE WITH LOW INCOME HOUSEHOLD JUST HAVE TO -- THEY CAN'T WORK FROM HOME.

A LOT OF THEM HAVE TO STILL GO TO THEIR JOBS SO THEY ARE AT A HIGH RISK OF GETTING COVID-19.
NEXT SLIDE, PLEASE.
AND THERE'S A DIRECT RELATIONSHIP BETWEEN LOW INCOME AND LOW INDICATION.
AND THAT'S WHAT WE SEE HERE.
SO THE MORE YOU GO TOWARD THE RIGHT ON THE FIGURE, THE LESS EDUCATED THE PEOPLE ARE.
AND WHAT WE SEE IS THE LIGHTER GREEN AND DARKER GREEN.
NOT HAVING A WORK FROM HOME OPTION AND DARKER GREEN IS WORK FROM HOME OPTION.
THE HIGHER THE DEGREE THE MORE YOU ARE ABLE TO WORK FROM HOME.
THE LESS EDUCATION, THE LESS YOUR OPTIONS TO WORK FROM HOME.
SO THESE ARE THE BIG, BIG -- SOME OF THE BIG UNSIGHTS THAT WE FOUND.
NEXT SLIDE, PLEASE.
IN TERMS OF COMMUTE.
IN TERMS OF TRAVEL MODE TO COMMUTE, WHAT WE FOUND IS -- ON THE LEFT-HAND SIDE HERE WE SEE THE PRECOVID-19 CASE AND THE RIGHT-HAND SIDE AND PRECOVID-19 CASE.
AND DURING COVID-19 A LOT OF THOSE COMMUTING TRIPS DON'T HAPPEN ANY MORE.
PEOPLE --
(AUDIO DIFFICULTIES)
THEY SEE THAT THE TREND HAS BEEN AFFECTED QUITE SEVERELY.
A LOT OF PEOPLE USED TO TAKE TRANSIT TO GO TO WORK AND IT'S JUST NOT HAPPENING AS MUCH NOW.
IN THAT CASE, HERE FROM THE FIGURE WE SEE -- IN LARGE PART BECAUSE PEOPLE ARE NOT COMMUTING ANY MORE.
AND IF WE CAN GO TO THE NEXT SLIDE.
MY LAST SLIDE.
IT'S ABOUT ATTITUDE AND RISK PERCEPTION.
SO PEOPLE DO FEEL -- IN THE UNITED STATES THAT RIDING PUBLIC TRANSPORTATION IS A HIGH RISK.
AND I LIKE TO EMPHASIZE THAT THIS IS REALLY FROM THE UNITED STATES.
I'M ACTUALLY FRENCH.
DURING THE WHOLE STAY AT HOME ORDER IN THE SPRING I WAS IN FRANCE.
PEOPLE WERE STILL USING TRANSIT.
PEOPLE WERE WEARING MASKS.
THEY WERE WASHING THEIR HANDLE.
AS FAR AS I KNOW IN MANY COUNTRIES IN THE WORLD PUBLIC TRANSIT RIDERSHIP HAS GONE UP TO PRECOVID-19 LEVELS AND THIS IS REALLY A U.S. THING.
SO RIDING PUBLIC TRANSPORTATION IS REALLY SEEN AS NOT SAFE AS WELL AS TAKE AN AIRPLANE.
NEXT SLIDE, PLEASE.
SO THIS IS REALLY BASIC, BASIC TRENDS THAT WE HAVE ANALYZED.
I'M SURE YOU WERE EXPECTING THEM.
WE HOPE TO HAVE MORE AND MORE DATA COMING SOON.
IT WILL BE AVAILABLE AT COVID FUTURE.ORG AND YOU CAN TAKE OUR SURVEY AT COVIDFUTURE.ORG WE ASK QUESTIONS ABOUT GENDER AND RACE AND ETHNICITY.
SO THERE'S DEFINITELY A LOT OF WORK TO BE DONE AND I LOOK FORWARD TO DOING IT AND SHARING IT WITH MANY OF YOU IN THE FUTURE.
THE LAST THING I WANT TO SAY IS WE DID HAVE A TWO-HOUR SESSION YESTERDAY ABOUT SOME OF THE RESULTS.
AND I HAVE THE RECORDING.

SO I WILL PUT THE LINK IN THE CHAT.
AND YOU ARE MORE THAN WELCOME TO WATCH IF YOU WANT TO.
AND OF COURSE I WILL STAY AROUND IF YOU HAVE ANY QUESTIONS AFTER ALL THE SPEAKERS HAVE PRESENTED.
THANK YOU VERY MUCH.
>> THANK YOU VERY MUCH, DR. DERRIBLE.
NOW DR. RICHARD CORSI.
DR. CORSI IS THE DEAN OF PORTLAND STATE UNIVERSITY OF MASEEH COLLEGE OF ENGINEERING AND COMPUTER SCIENCE.
HE HAS OVER 25 YEARS PRIOR TO HIS CURRENT POSITION AS PROFESSOR DEPARTMENT OF CHAIR AND ENDOWED CHAIR IN THE DEPARTMENT OF CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING AT THE UNIVERSITY OF TEXAS AT AUSTIN.
HE IS THE PRESIDENT OF THE ACADEMY OF FELLOWS OF THE INTERNATIONAL SOCIETY OF INDOOR AIR QUALITY AND CLIMATE.
DR. CORSI.
>> THANK YOU, LILIA.
SLIDE.
THANK YOU.
SO I'M GOING TO SPEAK ABOUT INDOOR AIR QUALITY, CLIMATE ADAPTATION AND ENVIRONMENTAL JUSTICE OR MORE SPECIFICALLY EQUITY.
I THINK EVERYBODY REALIZES WE ARE IN THE MIDDLE OF TWO HUGE CRISIS AT THE MOMENT.
TWO BIG CHALLENGES.
HORRIFIC, HORRIFIC PANDEMIC.
AND THE RAVAGES OF CLIMATE CHANGE CONTINUE.
OUT WEST WE SEE HORRIFIC WILDFIRES IN COMMUNITIES.
WHAT WE DO FOR THESE EVENTS ARE CONTRADICTORY.
IN SCHOOL WE ARE TOLD GREATER VENTILATIONS IN SCHOOLS AND IN HOMES AND GREATER VENTILATIONS EVERYWHERE AND FIRES WE ARE TOLD TO HAVE LESS VENTILATION IN HOMES AND SCHOOLS AND EVERYWHERE.
SO WE HAVE CONTRADICTORY THING WE HAVE TO DO TO DEAL WITH THESE CRISIS AT THE SAME TIME.
AND HOW WE DO THESE -- AND WE CAN DEAL WITH BOTH OF THESE THINGS BUT THEY ARE REAL EQUITY ISSUES BECAUSE OF THE COST OF TRYING TO DEAL WITH BOTH OF THOSE THINGS SIMULTANEOUSLY.
SO I WILL TALK ABOUT THAT IN MY NEXT FEW SLIDES.
NEXT SLIDE, PLEASE.
SO UNDERSERVED COMMUNITIES -- YOU KNOW, HAVE -- THEY STRUGGLE WITH BOTH OF THESE ISSUES, RIGHT.
WE HAVE MULTIGENERATIONAL FAMILIES IN MANY UNDERSERVED COMMUNITIES THAT LIVE IN SMALLER HOMES.
SO THEY ARE MORE PRONE TO RAPID SPREAD OF COVID-19 INFECTION IN THE HOUSEHOLD.
THEY LACK MONEY FOR EFFECTIVE CONTROLS IN THE HOME TO CONTROL AEROSOL PARTICLES IN THE AIR, FOR EXAMPLE.
THEY MAY HAVE LESS QUALITY HEALTH CARE.
AS SYBIL SAID, MANY IN UNDERSERVED COMMUNITIES CAN'T WORK FROM HOME SO THEY HAVE TO GO TO WORK.
THEY WORK IN SERVICE JOBS.
THERE'S BEEN A HUGE JOB LOSS IN THE SERVICE INDUSTRY, AND EVEN IF THEY KEEP THEIR JOB, SERVICE INDUSTRY TEND TO BE VERY LACKING IN CONTROLS FOR THINGS LIKE AEROSOL PARTICLES.

AND THEN IF WE LOOKING AT SCHOOLS, MOST IN UNDERSERVED COMMUNITIES GO TO PUBLIC SCHOOLS.
WE SAW YESTERDAY THAT NEW YORK CITY CLOSED ALL OF THEIR PUBLIC SCHOOLS AND MOST OF THE PRIVATE SCHOOLS ARE STAYING OPEN. AND PRIVATE SCHOOLS CAN STAY OPEN BECAUSE THEY ARE LESS DENSE.
THERE'S LESS CHILDREN IN THE CLASSROOM.
THEY HAVE A LOT MORE MONEY.
THEY CAN SPEND MONEY ON CONTROLLED TECHNOLOGIES TO IMPROVE THE ENVIRONMENT FOR COVID-19.
AND PUBLIC SCHOOLS DON'T HAVE THOSE -- THAT MONEY AND DON'T HAVE THOSE CONTROLS SO THEY HAVE GREATER INFECTION RISKS FOR THE STUDENT AS WELL AS TEACHERS AND STAFF.
NEXT SLIDE.
SO I'M GOING TO TALK ABOUT -- IN MY NEXT THREE SLIDE, ONE TECHNOLOGY THAT ACTUALLY CAN DEAL WITH BOTH THE EFFECTS OF COVID-19 REDUCING OUR DOSE AND THEREFORE RISK TO ASSOCIATE WITH AEROSOL PARTICLES THAT ARE VIRUS LADEN BUT ALSO HELP US DEAL WITH PARTICLES ASSOCIATED WITH WILDFIRE SMOKE WHICH CAN BE QUITE HARMFUL, ESPECIALLY TO PEOPLE THAT HAVE RESPIRATORY DISEASES LIKE ASTHMA.
HEPA AIR FILLERS ARE A PROVEN TECHNOLOGY.
AND THEY ARE A GREAT SUPPLEMENT TO TECHNOLOGY WHEN WE WANT TO VENTILATE LESS.
SO THEY CAN GIVE US AN EQUIVALENT WHEN USED APPROPRIATELY FOR AN AIR CLEANER. UP TO THREE OR FOUR AIR CHANGES PER HOUR, WHICH IS TYPICALLY MORE THAN YOU WOULD FIND ON AVERAGE IN AN AMERICAN HOME.
THEY ARE VALUABLE IN WILDFIRE SEASON.
SO MY WIFE AND I HAD TWO REALLY GOOD PORTABLE CLEANERS IN OUR HOUSE DURING WILDFIRE SEASON IN OR DONE AND THEY WORK DRAMATICALLY FOR US IN TERMS OF DRAMATICALLY LOWERS PARTICLES IN OUR HOME.
IN TERMS OF PARTICLES THAT CARRY THE SARS COV-2 VIRUS.
GOOD HEPA CLEANER CAN RUN YOU 250 TO $300 AND IF YOU WANTED TO HAVE MULTIPLES IN THE HOME OR HAD IN A CLASS OR A SCHOOL YOU ARE RUNNING INTO THE THOUSANDS OF TENSE OF THOUSANDS OF DOLLARS.
NEXT SLIDE, PLEASE.
SO WHAT HAS HAPPENED IS THERE HAS BEEN -- THIS IS REALLY EXCITING FOR ME.
THERE'S BEEN SOME REALLY BRIGHT INDIVIDUALS WHO HAVE SAID, LET'S SOLVE THIS PROBLEM BY MAKING OUR OWN PORTABLE AIR CLEANERS.
WHAT IF WE TOOK A $17 BOX FAN, AND WE PURCHASED A GOOD FILTER, A MERV-12 OR MERV-13 FILTER, AND WE PUT IT UP AGAINST A BOX FAN AND SUCKED THROUGH THE FILTER OPPOSED TO PUSHING THROUGH THE FILTER BECAUSE IF WE SUCKED IT WE WILL SEAL IT NICELY TO THE BOX FAN.
CAN WE REDUCE THAT TO REACH PARTICLES INSIDE SCHOOLS OR HOMES.
AEROSOL PARTICLES THAT MAY BE ASSOCIATED WITH VIRUS LADEN PARTICLES THAT CONTAIN THE COV-2 VIRUS AND THESE ARE RESULTS AND A TEST DONE BY PORTLAND STATE UNIVERSITY SHOWING ON THE VERTICAL ACCESS THE FINE CONCENTRATION IN A CUBIC METER IN A SMALL ROOM IN HIS HOME VERSUS MINUTES FROM WHEN THE FAN WAS TURNED ON AND HE WAS RUNNING AT 160 MICRO GRAMS PER CUBIC METER IN HIS HOUSE.
HE USED THIS IN HIS HOUSE ASK YOU CAN SEE THIS DRAMATIC REDUCTION FROM A DEVISE THAT COST HIM $35 TO BUILD, THE MERV-13 FILTER.
THE PROBLEM IS TRYING TO GET THIS RESISTANCE FROM A BOX FAN THROUGH A FILTER.

SO ON SOCIAL MEDIA I THREW OUT THE IDEA IN A MAYBE WE SHOULD ACTUALLY BUILD THE UNIT.
BUILD AN ACTUAL PORTABLE AIR CLEANER WHERE THE WALLS OF THE PORTABLE AIR CLEANER WERE MERV-13 CLEANERS SO WE COULD GET A HIGHER AIR FLOW.
SO NEXT SLIDE, PLEASE.
SO A WONDERFUL TICKER AND INNOVATOR IN TEXAS BUILT WHAT YOU SEE ON THE LEFT WHICH HE CALLED THE CORSI BOX, WHICH I SHOULDN'T TAKE CREDIT FOR.
BECAUSE HE BUILT IT WITHIN 24 HOURS OF HEARING THIS.
HE BUILT THIS BEAUTIFUL PORTABLE AIR CLEANER WHERE THE WALLS ARE ACTUALLY MERV-13 FILTERS AND DRAMATICALLY REDUCES THE RESISTANCE ON THE FAN.
SO YOU CAN GET A MUCH HIGHER FLOW THROUGH.
IT AND THE UNIT THAT YOU SEE HERE IS ALMOST AS EFFECTIVE AS ONE OF THESE 250 TO $100 FANCY PORTABLE AIR CLEANERS AT A FRACTION OF THE COST.
YOU KNOW ABOUT A SIXTH TO A SEVENTH OF THE COST.
SO ONE IDEA HERE IS -- IS IT POSSIBLE TO GET ORGANIZATIONS TO ASSIST WITH TEACHING PEOPLE -- MAYBE TEACHING HIGH SCHOOL STUDENTS HOW TO MAKE OR THOMAS PRODUCE THESE LOW COST PORTABLE AIR CLEANERS FOR SCHOOLS AND HOMES AND UNDERSERVED COMMUNITIES.
SO COINING THE TERM HERE CITIZEN MANUFACTURING AS A WAY OF DEALING WITH TWO CRISIS AT ONCE.
THE RAVAGES OF SMOKE FROM WILDFIRES AND ALSO THE RAVAGES OF VIRUS LADEN PARTICLES IN HOMES AND SCHOOLS ASSOCIATED WITH COVID-19.
CAN WE DEAL WITH BOTH OF THOSE AND SERVE UNDERSERVED COMMUNITIES WITH THESE NEW PORTABLE AIR CLEANERS, THAT ARE MUCH, MUCH LOWER COST?
SO I'M JUST THROWING THAT OUT THERE A AN IDEA FOR OUR COMMUNITY AND HOPING THAT SOME PEOPLE ARE INTERESTED IN IT.
SO THANK YOU.
>> THANK YOU, DR. CORSI.
VERY INTERESTING.
OUR NEXT SPEAKER IS DR. MARCCUS HENDRICKS.
DR. HENDRICKS IS AN ASSISTANT PROFESSOR IN THE SCHOOL OF ARCHITECTURE, PLANNING AND PRESERVATION AT THE UNIVERSITY OF MARYLAND.
HE IS ALSO THE DIRECTOR OF THE SIRJ LAB AND AN AFFILIATED RESEARCH FACULTY IN THE CLARK SCHOOL OF ENGINEERING'S CENTER FOR DISASTER RESILIENCE.
DR. HENDRICKS.
>> THANK YOU SO MUCH, DR. ABRON.
AND FIRST, I WANT TO SORT OF TAKE A MOMENT TO SORT OF GIVE YOU FLOWERS VERBALLY.
FOR TWO REASONS.
ONE, FOR THE WONDERFUL INTRODUCTION.
AND TWO, FOR BEING A TRAILBLAZER FOR FOLKS THAT LOOK LIKE YOU AND I TO BE IN THIS POSITION, AND TO BE DOING A WORK THAT YOU'VE DONE AND THAT I'M STARTING TO DO.
AND I DON'T TAKE THAT LIGHTLY.
AND I SINCERELY APPRECIATE IT AND WANT TO TAKE A MOMENT TO SAY THAT.
AS DR. ABRON SAID I'M DR. MARCCUS HENDRICKS.
I'M FROM THE UNIVERSITY OF MARYLAND AND DIRECT A LAB FROM STORMWATER INFRASTRUCTURE RESILIENCE AND SORCE LAB.
AND I WANT TO THANK AEESP FOR ALLOWING ME TO SHARE THIS SPACE WITH YOU ALL TODAY AS A PLANNER AND A SOCIAL SCIENCES BY TRAINING.
AND TO BE ABLE TO SHARE MY THOUGHT AND RESEARCH.
NEXT SLIDE, PLEASE.

SO THIS IS PROBABLY THE LAST GROUP THAT I HAVE TO CONVINCES THAT WE ARE IN THE MIDDLE OF AN INFRASTRUCTURE CRISIS.
FROM COLLAPSING BRIDGES IN CALIFORNIA TO OVERFLOWING STORM DRAINS IN HOUSTON. INFRASTRUCTURE SYSTEMS ARE FAR PAST THEIR PRIME.
AND DECAYING INFRASTRUCTURES ALL AROUND US, INCLUDING PUBLIC HOSPITALS WHERE WE HAVE SEEN -- YOU KNOW HAVE SERVICE -- YOU KNOW MARGINALIZED COMMUNITIES AND DISPROPORTIONATELY HAVE SUFFERED RELATIVE TO WHITE GROUPS AND OTHER GROUPS THAT HAVE HAD BETTER SERVICE AND TREATMENT.
THE AMERICAN SOCIETY OF CIVIL ENGINEERS HAS CONSISTENTLY SORT OF SCORED OUR NATIONS INFRASTRUCTURE FROM THE LOCAL LEVEL UP AT A D PLUS.
AND THIS INFRASTRUCTURE CRISIS HAS BEEN WELL DOCUMENTED, BOTH IN MEDIA AND A START IN THE RESEARCH.
NEXT SLIDE, PLEASE.
IN FACT, THIS SUMMER I TOOK A MOMENT TO FURTHER DOCUMENT THIS INFRASTRUCTURE CRISIS AND TO MAKE A CONNECTION BETWEEN THE CURRENT CORONAVIRUS PANDEMIC AND OUR INFRASTRUCTURE CRISIS BY DISCUSSING SANITARY SEWER OVERFLOWS AND BACK HUNDREDS IN THE CITY OF BALTIMORE AND A POTENTIAL RISK OF COVID TRANSMISSION BY-WAY OF WASTE WATER EXPOSURE.
NEXT SLIDE, PLEASE.
HOWEVER, YOU KNOW FOR ANYBODY THAT STUDIES ANY TYPE OF DISASTER AND CRISIS WE KNOW THAT SOCIAL STRATIFICATION IS INHERENT.
HOWEVER NO ATTENTION HAS BEEN PAID TO WHERE AND ON WHOM DOES THE BURDENS OF DECAYING INFRASTRUCTURE FALL HEAVIEST.
NEXT SLIDE, PLEASE.
SO I WANT TO TURN US TO SORT OF A SERIES OF SOCIAL PHENOMENON AND EVENTS THAT HAVE TRANSPIRED SINCE -- AS DR. ABRON SAID, FROM 1619 AND BEYOND IN TERMS OF THE BLACK AMERICAN EXPERIENCE FROM SLAVERY TO JIM CROW TO SEGREGATION AND RED LINING THROUGH THE CIVIL RIGHT ERA.
TO EVEN -- YOU KNOW MORTGAGE LOANS AND HOW BLACK AND BROWN HOUSEHOLD WERE DISPROPORTIONATELY EFFECTED IN 2008 DURING A GREAT RECESSION.
NEXT SLIDE, PLEASE.
THESE SOCIAL PROCESSES.
YOU KNOW FROM POVERTY TO DISCRIMINATORY PLANNING TO ONGOING ECONOMIC INVESTMENT AND SEGREGATION AND RED LINING AND RACIAL ZONING ARE INEXTRICABLY LINKED TO THESE PROCESSES IN TERMS OF THE INVENTORY CONDITION AND DISTRIBUTION OF PHYSICAL INFRASTRUCTURE SYSTEMS AND EVEN THE MAINTENANCE AND REHABILITATION DECISIONS AND PROCESSES THAT WE MAKE IN TERMS OF INVESTMENTS THROUGH CAPITAL IMPROVEMENT PROGRAMS.
HOWEVER MOST OFTEN FOLKS WHO HAVE BEEN INVOLVED IN THE SPACE OF INFRASTRUCTURE MANAGEMENT AND A BUILT-IN ENVIRONMENT HAVEN'T NECESSARILY MADE THIS CONNECTION BETWEEN THESE SOCIAL AND INFRASTRUCTURAL PROCESSES.
NEXT SLIDE, PLEASE.
BUT I WANT TO OFFER SORT OF TWO FRAMEWORKS THAT I WORK WITH BETWEEN ENVIRONMENTAL JUSTICE AND SOCIAL VULNERABILITY TO DISASTER THAT OFFERS US PERSPECTIVE BY WHICH WE MAY SORT OF EXAM THE CONNECTION BETWEEN SOCIAL PROCESSES AND INFRASTRUCTURE PROCESSES.
ENVIRONMENTAL JUSTICE TALKS ABOUT HOW THE NATION'S ENVIRONMENTAL LAW'S REGULATIONS POLICIES HAVE NOT BEEN FAIRLY APPLIED ACROSS ALL SEGMENTS OF THE POPULATION.

WHEN IT COMES TO SOCIAL VULNERABILITY TO DISASTER, SOCIAL STRATITIZATION BASED ON RACE, INCOME, GENDER, AGE, RACE, NATIONALITY CONTRIBUTE TO RISKS AND IMPACTS FROM DISASTERS.
AND I ALSO WANT A POLICY PARENTHETICALLY TO BE CLEAR THAT ALTHOUGH MOST OFTEN WHEN WE MAP AND MODEL ISSUES AROUND VULNERABILITY AND ENVIRONMENTAL INJUSTICE WE REDUCE TO RACISM AND CLASS ISSUE, BUT THESE ARE ISSUES OF RACISM AND CLASS AND SEXISM.
I WANT TO BE CLEAR ABOUT THAT. SO SELECTED MENTIONS OF THE ENVIRONMENTAL JUSTICE AND SOCIAL VULNERABILITY LITERATURES.
IN 1994 THEY WANTED TO INCLUDE THE INFRASTRUCTURE.
MY COLLEAGUE AT THE UNIVERSITY OF MARYLAND IN 2008 TALKED ABOUT THE FAILURE OF MUNICIPALITIES TO INSTALL UP TO CODE SEWER AND WATER INFRASTRUCTURE, CAN LEAD TO AS A RESULT AND SEWER WATER SYSTEMS, PARTICULARLY AMONG POOR PEOPLE AND PEOPLE OF COLOR.
DR. SHANNON VAN ZANDT IN 2012 STARTED TO ELUDE HOW INFRASTRUCTURE AND ENVIRONMENTAL FEATURES CAN POTENTIALLY MODIFY VULNERABILITIES AND MODIFY RISKS AND SOME OF MY EARLY WORK AND PARTICIPATORY PLANNING, I DISCUSSED HOW THROUGH PARTICIPATING AND COMMUNITY SCIENCE PROVISION OF INFRASTRUCTURE THERE'S AN OPPORTUNITY FOR US TO REDISTRIBUTE PUBLIC RESOURCES TOWARDS JUSTICE AND SUSTAINABILITY.
NEXT SLIDE, PLEASE.
SO THROUGH MILESTONE STORMWATER INFRASTRUCTURE AND RESILIENCE AND JUSTICE LAB AT THE UNIVERSITY, ME AND MY TEAM DO JUST.
THAT WE TALK ABOUT THE NEXUS OF ENVIRONMENTAL PLANNING AND PLANNING AND HAZARD MITIGATION AND DISASTER PLANNING TO THINK ABOUT THE EFFECTS OF INFRASTRUCTURE ON A NATURAL BUILT AND SOCIAL ENVIRONMENT.
WE ALSO EXPLORE THE ROLE OF INFRASTRUCTURE AND MODIFYING HAZARD AND CLIMATE RELATED RISK AND EVEN PUBLIC HEALTH OUTCOMES.
WE THINK ABOUT INFRASTRUCTURE DESIGN AND RESILIENCE AND ADAPTATION AND HOW WE MIGHT CHANGE THE WAY THAT WE DO BUSINESS, BOTH FROM A SOCIAL MANAGEMENT PERSPECTIVE AS WELL AS A PHYSICAL DESIGN PERSPECTIVE IN LIGHT OF SUSTAINABILITY.
I ALSO TALK A LOT ABOUT -- YOU KNOW HOW CAN WE MOBILIZE AND ACTIVATE COMMUNITY AND CITIZEN GROUPS TO BE INVOLVED IN OVERSEEING AND PROVISIONING INFRASTRUCTURE.
AND LAST -- AND CERTAINLY NOT LEAST, THE FOUNDATION OF MY RESEARCH PROGRAM AND THE WORK OUT OF MY LAB IS TO UNDERSTAND AND ADDRESS EQUITY AND ENVIRONMENTAL JUSTICE ISSUES RELATED TO INFRASTRUCTURE AND PUBLIC WORKS. PARTICULARLY IN TERMS OF PROCESSES, DISTRIBUTION AND RESTORATIVE JUSTICE.
NEXT SLIDE, PLEASE.
SO JUST TO TAKE YOU ALL REALLY QUICKLY THROUGH SOME EMPIRICAL WORK THAT I'VE DONE ACROSS THE COUNTRY BETWEEN HOUSTON AND WASHINGTON, D.C., I'VE BEEN ABLE TO SHOW THAT -- PARTICULARLY WHEN IT COMES TO STORMWATER INFRASTRUCTURED SYSTEMS, THAT COMMUNITIES OF COLOR ASK LOWER INCOMES AND INCOME COMMUNITIES IN HOUSTON HAVE STORMWATER SYSTEMS THAT ARE PAST THEIR PRIME AND OUTDATED BY DEVELOPMENT CODE, AND JUST FRANKLY NOT DESIRABLE BY THE COMMUNITY.
AND ALSO THE BURDEN OF MAINTAINING SOME OF THESE STORMWATER SYSTEMS THAT ARE DISPROPORTIONATELY LOCATED IN COMMUNITIES OF COLOR FALLS ON THE COMMUNITY THEMSELVES AS OPPOSED TO THE CITY OF HOUSTON TAKING RESPONSIBILITY.
AND ABOVE AND BEYOND SORT OF THE NEIGHBORHOOD LEVEL FACTORS THAT WE MIGHT ASSUME DRIVE THE DISTRIBUTION OF PHYSICAL SYSTEMS, THE PERCENT OF NON-HISPANIC

BLACK ABOVE AND BEYOND WAS THE MOST SIGNIFICANT PREDICTOR OF THE DISTRIBUTION OF THESE OUTDATED SYSTEMS.
NEXT SLIDE.
SO MY OTHER WORK ARE THEIR PARENTS AND TEACHER ON THE EAST END THE HOUSTON ARE DEVELOPED AN ASSESSMENT TECHNIQUE FOR INFRASTRUCTURE, TO BE ABLE TO THINK ABOUT HOW CAN WE ENGAGE COMMUNITY MEMBERS FOR TAKING OWNERSHIP OVER THESE SYSTEMS AND WORKING WITH CITIES IN ORDER TO EFFECTIVELY MANAGE THESE SYSTEMS.
BUT MOST OFTEN I KNOW NOT ONLY ARE THESE COMMUNITIES OVERBURDENED BY ENVIRONMENTAL BAGS AND LOCALLY UNWANTED LAND USES BUT THEY ALSO STRUGGLE WITH THE BURDEN OF PROOF IN TERMS OF BEING ABLE TO EMPIRICALLY DEMONSTRATION THESE THINGS.
SO IMMEDIATELY AFTER I DEVELOPED THIS ASSESSMENT TECHNIQUE I TOOK IT A STEP FURTHER AND DEVELOPED AN EXPERIMENT ALONG WITH SOME OF MY ENGINEERING COLLEAGUES AT TEXAS TO WHERE WE SET UP AN EXPERIMENT BY WHICH COMMUNITY DESIGNS AND TRAINED ENGINEERS AND LIGHT OUR TECHNOLOGY INSPECTED THE SAME SET OF INFRASTRUCTURE ASSETS.
AND WE WERE ABLE TO EMPIRICALLY SHOW THERE WASN'T A STATISTICS DIFFERENCE IN THE QUALITY OF DATA BETWEEN CITIZENS AND SCIENTISTS IN LIKE OF TECHNOLOGY IN TERMS OF VALIDITY AND RELIABILITY NEXT SLIDE, PLEASE.
AND LASTLY ONE OF MY MORE RECENT PUBLICATIONS REALLY JUST SHOWS HOW WE HAVE TO SORT OF ENVISION A FUTURE BY WHICH MUNICIPALITIES AND UNIVERSITIES PARTNER WITH COMMUNITIES TO DESIGN GRASS-ROOTS MASSIVE PLANS TO INCLUDE ISSUES THAT ADDRESS ISSUES FROM SUSTAINABILITY TO CLIMATE CHANGE AND FLOOD RISK.
AND THESE SORT OF GRASS-ROOTS MASSIVE PLANS ARE SORT OF THE FIRST STEP OF LEVEL THE LANDSCAPE FOR THESE COMMUNITIES WHO HAVE BEEN MARGINALIZED OVER TIME.
NEXT SLIDE, PLEASE.
SO THE MAINTAINING WHEYS FOR MY PRESENTATION IS REALLY CHARGING YOU -- CHALLENGING YOU ALL TO THINK ABOUT EQUITY AND INFRASTRUCTURE AND PROCEDURAL AND DISTRIBUTIVE AND RESTORATIVE JUSTICE AND BUILT ENVIRONMENT AND HOW STORMWATER MUST BE RECOGNIZED IN TERMS OF SOCIAL CIRCUMSTANCES AND IN TERMS OF THESE LARGER SOCIAL PROCESSES THAT HAVE OUTCOMES RELATED TO INFRASTRUCTURE.
ASK LASTLY THE FUTURE IS HOPEFULLY MORE DEMOCRATIC.
AND DEMOCRACY IS ALIVE AND WELL.
AND THE MORE FOLK WE HAVES PARTICIPATES IN PROCESSES RELATED TO INFRASTRUCTURE AND BEYOND IS CRITICAL THROUGH COMMUNITY SCIENCE AND CIVIC PARTICIPATION AND DIFFERENT TYPES OF PARTNERSHIPS THAT ARE FUNDAMENTAL TO EQUITY AND RESILIENCE.
NEXT SLIDE, PLEASE.
AND ALWAYS I JUST LIKE TO END ON THIS SLIDE.
THIS PICTURE IS A PICK OF ME AND A GROUP OF BLACK AND BROWN STUDENTS IN HOUSTON WHO I DEDICATED MY DISSERTATION RESEARCH TO.
AND I REALLY BELIEVE THEY ARE THE VANGUARD OF THE ENVIRONMENTAL JUSTICE MOVEMENT MOVING FORWARD.
AND I OWE ALL OF MY EARLY WORK AND MY ENTIRE CAREER TO THEM IN TERMS OF REALLY SHARING WITH ME THEIR KNOWLEDGE AND INCIDENT WIGS AROUND A NUMBER OF THESE CRITICAL ISSUES.
THANK YOU ALL SO MUCH.
>> THANK YOU, DR. HENDRICKS.
OUR NEXT SPEAKER IS DR. SHANNON CAPPS.

DR. CAPPS IS AN ASSISTANCE PROFESSOR OF CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING AT DREXEL UNIVERSITY.
DR. CAPPS LEADS THE ATMOSPHERIC MODELING AT DREXEL GROUP WHICH CONDUCTS OUTDOOR AIR QUALITY MODELING TO ESTIMATE INFULENCES OF EMISSION SOURCES, EVALUATE HEALTH, ECOSYSTEM AND CLIMATE IMPACT OF POLLUTANTS.
AND ASSIMILATE SATELLITE BASED OBSERVATIONS TO IMPROVE MODELS.
DR. CAPPS.
>> THANK YOU, DR. ABRON.
THINK FOR A DAY ABOUT HOW --
(AUDIO DIFFICULTIES)
HOW THING HAVE CHANGED FOR PEOPLE DURING COVID-19 AND I WANT TO INTRODUCE THE PROCESS BY WHICH WE ASK THIS QUESTION.
DO PICTURES OF AIR POLLUTION FROM SPACE ACTUALLY REFLECT THOSE CHANGES IN U.S. CITIES?
NEXT SLIDE, PLEASE.
SO WE TAKE PICTURES OF AIR POLLUTION FROM SPACE WITH SPECIAL CAMERAS LIKE THE TROPE STRUM.
THESE GLIDE AROUND THE WORLD EVERY DAY AND PROVIDE A PICTURE WITH IMAGES OF 3 KILOMETRES TO BY 5 KILOMETRES SO THEY ARE HIGH ENOUGH RESOLUTION TO TELL THE DIFFERENCE IN CONCENTRATIONS OF POLLUTANTS ACROSS CITIES AND WITHIN THEM.
WE USE THIS INSTRUMENT BECAUSE IT MEASURES THE CONCENTRATION OF NITROGEN DIOXIDE BETWEEN THE SATELLITE AND THE GROUND OVER WHICH IT'S LOOKING.
ONE THING THAT HAPPENS IN THAT SPACE IS CARS ARE DRIVING ALONG, BURNING FOSSIL FUELS AND CREATING EMISSIONS OF OX I'DS OF NIGHT DEPEND.
THESE CHANGE CHEMICALLY IN THE AREA TO FORM NITROGEN DIOXIDE. AND WE CAN GET PICTURE OF THAT THROUGH SATELLITES.
WE CAN GET PICTURE OF THESE EARLY IN THE PANDEMIC IN MARCH AND PAPER WHEN CHANGES FROM A COUPLE WEEKS BEFORE TO THE WEEKS WHERE PEOPLE WERE IN LOCKDOWN REFLECTED SIGNIFICANT DROPS IN THE CONCENTRATION OF AIR POLLUTANTS.
BUT THE QUESTION WE WANTED TO ASK WAS WHETHER THOSE WERE REFLECTIVE PRIMARILY OF DRIVING PATTERNS OR IT MIGHT NOT BE ATTRIBUTABLE TO THAT.
IN ORDER TO ANSWER THAT QUESTION WE FOCUSED ON TEN U.S. CITIES, SPECIFICALLY THE COMBINED STATISTICAL AREA AROUND CITIES.
THIS ENCOMPASSES WHERE PEOPLE ARE DRIVING FROM INTO URBAN AREAS FOR WORK.
SO IT'S QUITE RELEVANT FOR EQUITY WHEN PEOPLE ARE DRIVING IN FROM SUBURBS INTO DENSE TRAFFIC IN CITY, THE PEOPLE MOST EXPOSED TO THAT POLLUTION BOB THOSE WHO ARE DWELLING THERE.
SO THERE ARE INTERESTING QUESTIONS ABOUT EQUITY THAT WE ARE ASKING HERE.
I'M FOCUSING THE RESULTS IN THIS TALK TODAY ON NITROGEN DIOXIDE CONCENTRATIONS IN TWO CITIES, NEW YORK AND DALLAS FORTH WORTH.
BUT I SHOULD NOTE NOT ONLY IS NITROGEN DYING EXCITED MADE WHEN YOU DRIVE A CAR.
ALSO CARBON DIOXIDE IS MADE AND THAT IS A CONTRIBUTOR TO GREENHOUSE WARMING.
SO THIS IS THE WAY WE CAN HAVE SOME INTERSECTION OF THIS WORK WITH CLIMATE CHANGE.
NEXT SLIDE, PLEASE.
YOU WILL SEE HERE RESULTS FROM THE TWO CITIES, DALLAS AND NEW YORK CITY OF THESE ARE TIME SERIES OF THE CONCENTRATIONS OF NITROGEN DIOXIDE ON A WEEKLY AVERAGE OVER THOSE TWO AREAS.

WHAT WE WERE SURPRISED BY WAS HOW LARGE THE DIFFERENCES ARE FROM WEEK-TO-WEEK IN THE AVERAGE IN BOTH DALLAS AND NEW YORK WHEN WE LOOKED AT ONLY THAT PURPLE LINE.
THAT'S FOR 2020.
THAT CAUSED US TO GO BACK AND ASK, ARE THESE CHANGES JUST DUE TO METEOROLOGY AND OTHER SOURCES CHANGING?
OR ARE THE DROPS THAT WE SEE IN THE PURPLE TIME SERIES AROUND LATE MARCH AND EARLY APRIL ACTUALLY REFLECTIVE OF CHANGES WITH BEE LIFE YOUR DURING COVID?
WHEN WE SAW THAT THE MAGNITUDE OF THE CHANGE WAS SIMILAR FROM THE SATELLITE BASED PICTURES IN 2019, WE THOUGHT WE SHOULD TAKE A MORE CAREFUL LOOK AT THE NO2 CONCENTRATIONS THAT ARE MEASURED LOCALLY.
NEXT SLIDE, PLEASE.
HERE WE HAVE THE DAILY MAXIMUM OF THE NO2 CONCENTRATION MEASURED AT SPECIFIC LOCATIONS IN THESE CITIES BY THE ENVIRONMENTAL PROTECTION AGENCY'S MONITORS THAT ARE ALWAYS OPERATING.
YOU CAN SEE THAT THE CHANGES FROM DAY-TO-DAY ARE MORE SIGNIFICANT.
ANYTHING ABOVE THE BLACK LINE MEANS THAT IT IS ANSWER CREASE FROM THE 2019 LEVELS TO 2020.
ANYTHING BELOW THE BLACK LINE WOULD BE A DECREASE.
WE SEE A DECREASE AS WE EXPECTED IN DALLAS AROUND LATE MARCH IN BOTH THE SATELLITE, THE BLUE LINE AND THE LOCALLY OBSERVED CHANGES, THE RED LINE.
LIKEWISE IN NEW YORK THIS IS ACTUALLY A LONGER BUT SMALLER PERCENTAGE-WISE DEPRESSION OF THESE CONCENTRATIONS.
AND WHAT THIS TOLD US IS THAT WE CAN HAVE SOME CONFIDENCE IN THE SATELLITE BASED OBSERVATIONS OF CHANGES AND NO2 CONCENTRATIONS EVEN AT THESE CITY SCALES.
NEXT SLIDE, PLEASE.
WHY WE WANTED TO LOOK AT DIFFERENT CITIES IS BECAUSE THESE OXIDES OF NITROGEN ARE NOT ONLY PRODUCED BY LARGER SOURCES, NOT JUST CARS AND TRUCKS BUT CARS AND TRUCKS MAKE UP A LARGER PORTION OF THE CITIES WITH A BLUE PORTION OF THE BARS BUT IF YOU LOOK AT THE BARS, THE FUEL FOR HEATING OR PROCESSING INDUSTRIAL SECTOR WHERE CHEMICAL COMPONENTS ARE BEING MADE BY BURNING FOSSIL FUELS THOSE ALSO CONTRIBUTE TO OXYGEN NITRIDES.
IF YOU LOOK IN NEW YORK YOU CAN SEE A BLUE BAR.
THIS MEANS IF ONE PERSON IN NEW YORK STOPS DRIVING THEY WOULD HAVE A SMALLER IMPACT ON THE NO2 CONCENTRATION THAN A PERSON WHO STOPS DRIVING IN DALLAS.
NEXT SLIDE, PLEASE.
KNOWING THAT WE WANTED TO TAKE A LOOK AT THE MEASURES OF BEHAVIOR THAT ARE ACCESSIBLE IN THE ENTIRE U.S. AND THOSE ARE PEOPLE STAYING AT HOME BASED ON GOOGLE'S MOBILE DATA.
SO THESE ARE PEOPLE WHO'S CELL PHONES REMAIN IN THE SAME PLACE FOR 24 HOURS.
THAT IS SHOWN IN THE ORANGE LINE.
AND WE CAN SEE A TREMENDOUS INCREASE FROM THE EARLY 2020 LEVELS IN LATE MARCH AND APRIL.
IN BOTH DALLAS AND NEW YORK.
THOUGH THE INCREASE IS A BIT LARGER IN NEW YORK CITY THAN IT IS IN DALLAS PERCENTAGE-WISE OF THE GREEN-LINE INDICATES THOSE WHO HAVE CEASED TO REQUEST DRIVING DIRECTIONS FROM APPLE MAPS AND THAT'S A SIMILAR INDICATOR.
WHEN IT IS NEGATIVE IT IS INDICATING THAT WE WOULD EXPECT FEWER EMISSIONS FROM MOBILE SOURCES.

SO WE HAVE FEWER PERCENT-AGENDA WIDE PEOPLE STAYING HOPE IN DALLAS BUT A SIMILAR PROXIMATE CHANGE IN DRIVING DIRECTIONS.
NEXT SLIDE, PLEASE.
PUTTING TOGETHER THESE CHANGES IN BEHAVIOR WITH THE CHANGES OBSERVED IN CONCENTRATION AND THINKING ABOUT THE FACT THAT ONE PERSON WHO STOPS DRIVING IN DALLAS WILL HAVE A BIGGER IMPACT ON THE NO2 CONCENTRATION, WE CAN SEE EXACTLY WHAT WE EXPECT.
WE HAVE A LARGER DECREASE IN THE NO2 CONCENTRATIONS IN DALLAS, EVEN THOUGH FEWER PEOPLE STOP DRIVING THAN WE OBSERVE SIMULTANEOUSLY IN NEW YORK WHEN MORE PEOPLE STARTED STAYING HOME IN LATE MARCH.
SO THIS IS INDICATIVE TO US THAT WE CAN ACTUALLY TELL -- NOT ONLY ABOUT THE CONCENTRATION BUT IF WE GO THROUGH THE DETAILS WELL ENOUGH WE CAN SEE FROM STATES WE ARE ABLE TO OBSERVE WHAT KINDED OF TRANSPORTATION PEOPLE ARE CHOOSING.
A PRACTICAL IMPACT WOULD BE PERHAPS HAVE YOU LEARNED TO RIDE A BIKE DURING COVID.
OR FOUND A GREAT WALKING PATH TO SOME THING THAT ARE YOU STILL ABLE TO DO OUTSIDE THE HOME.
THOSE THINGS DONE AT SCALE.
SO 20 TO 30% OF THE CITY EMPLOYING WALKING OR BIKING INSTEAD OF DRIVING WOULD HAVE AN IMPACT THAT WOULD BE VISIBLE FROM SPACE ON AIR POLLUTION IN CITIES.
THANK YOU SO MUCH FOR THE OPPORTUNITY TO SHARE THIS WORK.
PLEASE FEEL FREE TO CONTACT ME WITH FURTHER QUESTIONS.
>> THANK YOU VERY MUCH, DOCTOR CAPPS.
VERY INTERESTING.
OUR LAST SPEAKER.
MY NEXT PRESIDENT TO BE IN THE AMERICAN ACADEMY, DR. DAN OETHER.
DR. OETHER IS A PROFESSOR AT CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING AT MISSOURI INFLUENCE OF SCIENCE AND TECHNOLOGY.
HE IS AN AMERICAN SCIENCE DIPLOMAT AND SOCIAL ENTREPRENEUR AND PROFESSOR OF ENVIRONMENTAL HEALTH ENGINEERING:
HE IS VICE PRESIDENT OF THE AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS AND SCIENTISTS.
DR. OETHER.
>> THANK YOU, DR. ABRON.
I APPRECIATE IT.
AS BEING THE LAST SPEAKER, MY SLIDE ARE PERHAPS A LITTLE LESS DEALED AND I'M TRYING TO LEAVE YOU WITH PERHAPS A BROADER VIEW OF NEXT THINGS WE MIGHT UNDERTAKE.
AND THIS IS GOING TO BE A LITTLE BIT OF A DIFFERENT TALK FOR ENVIRONMENTAL ENGINEERS AND SCIENTISTS.
I'M TALKING ABOUT HOW DO WE USE INSURANCE TO PROMOTE COMMUNITY RESILIENCE?
NOW MY SLIDES ARE POSTED ON MY TWITTER FEED.
SO FOR NOSE OF YOU THAT LIKE TO ACTUALLY SEE THE SLIDES OR HAVE COPIES THE JPEGS ARE ON TWITTER.
SO I WOULD LOVE FOR YOU TO COMMENT AND MAKE POINT ON THAT AS WELL.
ON THE NEXT SLIDE WE WILL SEE THE ACTUAL OBJECTIVES OF THIS PRESENTATION.
THERE WE GO.
SO THERE'S THREE LEARNING OBJECTIVES I'M TRYING TO GET YOU TO LEAVE HERE LEARNING THREE THING.
NUMBER ONE.

SUSTAIN ALBERTA DEVELOPMENT INCLUDES MORE THAN MEETING IMMEDIATE PHYSIOLOGICAL NEEDS.
MUCH OF WHAT WE DO IN ENVIRONMENTAL ENGINEERING AND SCIENCE IS AROUND MEETING IMMEDIATE PHYSIOLOGICAL NEEDS.
ACCESS TO CLEAN WATER.
ACCESS TO TOILETS.
ACCESS TO CLEAN FOOD, RIGHT.
THESE ARE THE THINGS THAT WE HAVE HISTORICALLY DONE.
BUT SUSTAINABLE DEVELOPMENT.
WHAT WE ARE DOING AT THE UNITED NATIONS BETWEEN NOW AND 2030 MEANS MORE THAN THAT.
AND WE WILL GET INTO THAT IN A SECOND.
AND ALSO ENVIRONMENTAL ENGINEERING, PARTICULARLY IN A WORLD THAT IS THINKING ABOUT ADAPTING TO A CHANGING WEATHER PATTERN TO A CHANGING CLIMATE MEANS IN A WE NEED TO BECOME PART AND PARCEL OF THIS IDEA OF BUILDING BACK BETTER.
THE WORLD NEEDS TO BE BUILT IN A WAY TO ADDRESS WHAT THE FUTURE LOOKS LIKE.
WE NEED TO BE IMAGINING THAT OUR KID RIGHT NOW GOING TO SCHOOL ARE GOING TO RETIRE INTO A WORLD OF 2065.
2075.
SO THE THING WE ARE BUILDING NOW HAVE TO BE ABLE TO EXIST INTO THAT WORLD.
BUT WE HAVE A DIFFICULT TIME EVEN IMAGINING.
SO THAT MEANS THAT WE NEED TO DESIGN SYSTEMS TO COME BACK BETTER.
ALSO, AND AS I THINK THIS IS A THEME THROUGHOUT THIS ENTIRE MEETING BUT ESPECIALLY IN THIS PARTICULAR PANEL.
THE WAY WE TEACH AND PRACTICE, AND THE WAY WE ENGAGE WITH POLICY AND ENVIRONMENTAL ENGINEERING MUST TRULY LEVERAGE CONVERGENCE.
AND I'M GOING TO GET INTO THIS AT THE END OF MY TALK ABOUT WHAT THAT MEANS TO ME AND WHY I THINK THAT'S IMPORTANT.
SO ON THE NEXT SLIDE WE WILL SEE THE BACKGROUND THAT MOTIVATES THIS.
NOW I THINK ALL OF THIS IN ENVIRONMENTAL ENGINEERING HAVE SEEN THIS DEFINITION FROM OUR COMMON FUTURE.
WHAT IS SUSTAINABLE DEVELOPMENT?
IT'S MEETING THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF THE FUTURE TO GENERATIONS TO MEET THEIR OWN NEEDS.
AND I WOULD SUGGEST TO YOU MANY OF THE TIMES WHEN WE TALK ABOUT THE BEGINNING, WE TALK ABOUT THE TIMELINESS OF IT, THE CONSUMPTIVENESS OF IT.
LET'S NOT BE GLUTINOUS BECAUSE THIS IS GOOD FOR OUR CHILDREN AND GRANDCHILDREN.
LET'S NOT OVERCONSUME.
THESE ARE IMPORTANT THINGS TO COME OUT OF THIS.
BUT I WILL PUT A KEY ON THE WORD NEEDS.
WHAT IS A NEED?
A PAIR OF TENNIS SHOES A NEED.
IS A RAIN COAT OVER TOP OF A WINTER COAT A NEED?
WHAT DO WE MEAN BY NEED?
WHEN WE TURN TO THE HIERARCHY OF NEED A GREAT TOOL TO UNDERSTAND WHAT DO PEOPLE NEED OF THE BOTTOM RUN IS THE PHYSIOLOGICAL NEED.
PEOPLE NEED FOOD AND THEY NEED WATER.
AND WE UNDERSTAND IN A AS ENVIRONMENTAL ENGINEERS AND SCIENTISTS.
WE WORK ON PROVIDING THAT TO PEOPLE.
BUT OFTENTIMES WE STOP THERE.

SO WE KIND OF OPERATE IN THIS WORLD WITH THE HAVE AND HAVE-NOTES.
THERE'S THOSE WE HELPED WITH PHYSIOLOGICAL NEEDS AND THOSE WE HAVEN'T HELPED.
SO WE DO THING THAT GET PEOPLE ACCESS TO MEETING THOSE NEEDS BUT I WOULD ACTUALLY PAUSE IT OR ARGUE THAT MORE THAN THAT IS WE NEED TO LOOK UP THE PYRAMID.
WE HAVE THE ABILITY TO CONTRIBUTE TO SAFETY AND SECURITY, TO LOVE AND FELLOWSHIP.
TO ESTEEM.
WE HAVE THE ABILITY TO CONTRIBUTE IN MORE THAN JUST MEETING THE PHYSIOLOGICAL NEED.
THIS IS WHERE THE SUSTAINABLE DEVELOPMENT GOALS, THE 1 GOALS THAT THE WORLD IS DOING BETWEEN NOW AND 2030 BECOME SO IMPORTANT.
SO IF YOU ARE NOT FAMILIAR WITH THEM, I URGE TO YOU BECOME FAMILIAR WITH THEM.
YES IT'S ABOUT GETTING WATER FILTERS TO FOLKS AND IMPROVING WATER SYSTEMS.
BUT IT'S ABOUT MAKING THE WATER SYSTEMS SECURE SO THEY CONTINUE TO DELIVER WATER EVEN WHEN THERE IS A DRAWING.
YOU NOTICE I DIDN'T SAY IF THERE IS DRAWING I SAY WHEN THERE IS A DRAWING.
SO WE LOOKING AT THE NEXT SLIDE.
DEVELOPMENT.
BETWEEN NOW AND 2030.
BETWEEN NOW AND 2050.
FOREVER, DEVELOPMENT IS ALWAYS INTERRUPTED BY DISASTER.
THIS IS SHOWN HERE BY THE CIRCLE ON THE LEFT-HAND SIDE.
WE HAVE A RESPONSE TO A HORRIBLE DISASTER.
WE END UP RECOVERING FROM IT IN SOME WAY.
AND THEN AS WE GO FORWARD WITH DEVELOPMENT WE TRY TO MITIGATE WHAT WOULD BE FUTURE DISASTERS.
WE TRY TO PREPARE FOR FUTURE DISASTER.
SO WE USED EXPERIENCES, PAST EXPERIENCES WITH SARS TO BE ABLE TO PREPARE FOR THIS CURRENT EXPERIENCE.
WE ARE RIGHT NOW RUSHING A VACCINE OUT BASED ON PAST EXPERIENCE WHICH WILL MAKE US BE ABLE TO RECOVER BETTER IN THE FUTURE.
AND CERTAINLY TECHNOLOGY CONTRIBUTES TO THAT.
BUT FINANCIAL SYSTEMS CONTRIBUTE TO THAT.
SO THIS IS THE GECKO FROM GEICO, RIGHT.
WE ALL KNOW.
THAT YOU HAVE INSURANCE.
INSURANCE IS ONE OF THOSE FINANCIAL INSTRUMENTS THAT WE AS ENGINEERS CAN MAKE CONTRIBUTIONS TO.
ALL INSURANCE IS UNDERPINNED BY MODELS.
AND WE AS ENGINEERS UNDERSTAND SYSTEMS THINKING.
WE UNDERSTAND AND CREATE MODELS.
IF WE CAN CREATE THE RIGHT KIND OF MODELS, WE CAN INCENTIVIZE THE RIGHT KIND OF BEHAVIORS.
WE KNOW OUR LIFE INSURANCE COSTS LESS IF WE GIVE UP SMOKING.
WE KNOW OW HEALTH INSURANCE COSTS LESS IF WE GET MORE EXERCISE.
IMAGINE IF WE INCORPORATED CLIMATE RESILIENCE INTO INSURANCE.
WHAT WOULD THAT LOOK LIKE?
COULD WE INCENTIVIZE THE RIGHT KIND OF CLIMATE BEHAVIORS BECAUSE WE CREATED GOOD MODELS TO UNDERPIN WISELY DEVELOPED INSURANCE POLICIES? SO ON NEXT SLIDE

I WILL SAY, YOU KNOW WE ACTUALLY HAVE DONE THIS IN ENVIRONMENTAL ENGINEERING AND SCIENCE.
REDUCE BE REUSE, RECYCLE.
IT'S KNOT INSURANCE BUT IT IS A FINANCIAL INSTRUMENT TO NUDGE BEHAVIORS.
THE IDEA OF A FINANCIAL BENEFIT FOR RECYCLING YOUR PLASTIC BOTTLE.
THAT IS A NUDGE BEHAVIOR.
THAT IS A FANTASTIC TOOL FOR CAUSING PEOPLE TO APPROACH THE WORLD SLIGHTLY DIFFERENTLY.
AND THAT HELPS.
IT COMPLIMENTS.
IT'S SYNERGISTIC WITH OUR TECHNOLOGIES.
SO AS WE WILL SEE ON THE NEXT SLIDE, I'VE BEEN WORKING ON HOW TO HELP THE CARIBBEAN FISHERIES INDUSTRY DEAL WITH A CHANGE IN CLIMATE.
PRACTICALLY SPEAKING.
THE OCEANS ARE GETTING WARMER.
THERE'S MORE CO-2.
FISH MIGRATE IN DIFFERENT WAYS.
THERE ARE WORSE AND MORE STORMS THROUGH THE CARIBBEAN.
AND THE FISHING INDUSTRIES HIGHLY SUSCEPTIBLE TO THOSE STORMS.
SO HOW DO YOU CONVINCE FISHERS TO USE SLIGHTLY INTERNETS?
TO NOT DRAG THING ACROSS THE REEF?
TO NOT USE SUCH SMALL NETS THAT THEY CAPTURE THE LITTLE FISH IN ADDITION TO THE MATURE LARGER FISH.
HOW DO YOU INCENTIVIZE THE BEHAVIOR TO MOVE TO AN INBOARD MOTOR VERSUS AN OUTBOARD MOTOR.
TO NOT HAVE AS MUCH MARINE POLLUTION?
WE HAVE DESIGNED AN INSURANCE SCHEME SO FISHERS BUILD BACK BETTER AFTER THE DAMAGE OF A STORM.
NOW THIS SAME TOOL IS BEING APPLIED TO DISEASE OUTBREAKS LIKE COVID.
NOW IN CASE OF COVID, THE PROVERBIAL HORSE IS OUT OF THE BARN, RIGHT.
WE CAN'T MAKE AN INSURANCE SCHEME FOR COVID BECAUSE WE ARE ALREADY LIVING THROUGH.
IT BUT WHAT WOULD IT LOOK LIKE IF WE USED INSURANCE SCHEMES TO HELP INCENTIVIZE VACCINE INTAKE.
WE HAVE RUSHED A ADVANTAGE AND NOW THE DISCUSSION IS DO WE OR DON'T WE REALLY TRUST THAT WE FEEL IT'S SAFE TO GET THIS RUSHED VACCINE.
BOTH PEOPLE WHO LIKE VACCINES AND THOSE THAT DON'T ARE STARTING TO RAISE CONCERNS AND WE HAVEN'T THOUGHT ABOUT HOW DO WE HAVE AN INSURANCE SCHEME OUT THERE.
HOW DO WE FEEL SAFE AND SECURE THAT THE ADVANTAGE IS SOMETHING THEY SHOULD GO TAKE.
BECAUSE IT IS SAFE FOR THEIR FAMILIES.
IT IS SAFE FOR THEIR LOVED ONES.
THIS IS AT PLACE WHERE ENGINEERS CREATE MODELS THAT DESCRIBE RISK.
THAT COMMUNICATE THAT RISK ACCURATELY.
THAT LINK FINANCE TO PEOPLE TO THE PLANET.
THINGS THAT WE DO IN ENVIRONMENTAL ENGINEERING.
HERE'S WHERE WE CAN MAKE SOME CONTRIBUTIONS.
FOR THOSE OF YOU THAT WOULD LIKE TO KNOW MORE ABOUT, IT ON THE NEXT SLIDE I HAVE SOME BIBLIOGRAPHY.
HERE'S WHERE I THINK WE NEED TO MOVE OURSELVES.

I HAVE A PAPER THAT DISCUSSIONS HOW I CAME UP WITH COAST AND WORKED THAN IN PARTNERSHIP WITH THE CARIBBEAN.
BUT THE THREE PAPERS IF YOU HAVEN'T READ I HIGHLY RECOMMEND YOU READ ARE THE MIHELCIC'S 2017 SCIENCE WHERE THEY DESCRIBE HOW MUCH BROADER A VIEW WE HAVE ON ENVIRONMENTAL ENGINEERING.
HOW MUCH WE NEED TO RETURN TO OUR ROOTS OF ADDRESSING HEALTH ISSUES MORE BROADLY.
IT'S NOT THAT WE SHOULDN'T DO LAB EXPERIMENTS AND NOT THAT WE SHOULDN'T CONTINUE TO MAKE ACTIVATED SLIDE WORK A LITTLE BETTER OF IT'S THAT WE HAVE AN OBLIGATION TO DO MORE.
WE HAVE AN OPPORTUNITY TO DO MORE.
AND THEN I REALLY LIKE THE PAPER BY EDWARD AND ROY.
AGAIN AN ENVIRONMENTAL ENGINEERING AND SCIENCE IN 2017 THAT RAISES THE SPECTRUM THAT PERHAPS WE ARE INCENTIVIZING ON FIELDS IN THE WRONG WAY, AND THAT DIRECTS US TO MONTOYA IN 2020.
IF WE WANT PEOPLE TO ENGAGE IN COMMUNITY RESEARCH.
IF WE WANT PEOPLE TO BE TRULY CONVERGENT IN ENVIRONMENTAL ENGINEERING WE MUST CHANGE THE WAY WE PROMOTE ENVIRONMENTAL AND TENURE AND MUST CHANGE THE WAY WE SUPPORT FACULTY WANTING TO WORK IN THESE ACTION RESEARCH AREAS.
LAST SLIDE, PLEASE.
I TOLD YOU I WAS GOING TO TRY TO CONVINCES YOU OF THREE KIND OF LEARNING OBJECTIVES HERE.
I HOPE I HAVE CONVINCED YOU THAT SUSTAINABLE DEVELOPMENT MEANS MORE THAN JUST MEETING OUR IMMEDIATE PHYSIOLOGICAL NEED.
I HOPE I HAVE CONVINCED YOU THAT ENVIRONMENTAL ENGINEERS HAVE AN OBLIGATION AND AN OPPORTUNITY TO HELP BUILD BACK BETTER.
AND THAT'S WHERE RESILIENCE WILL COME.
FROM AND I HOPE I HAVE CONVINCED YOU THAT THERE'S A LOT OF SMART PEOPLE OUT THERE THAT ARE PUSHING HARD TO SAY THAT WE NEED TO CHANGE OUR WAY THAT WE LOOKING AT TEACHING AND PRACTICE AND POLICY, TO TRULY LEVERAGE CONVERGENCE.
THANKS FOR YOUR ATTENTION.
I APPRECIATE YOU BEING HERE.
>> THANK YOU, PROFESSOR OETHER.
I THINK WE WILL ALL COME BACK TOGETHER NOW FOR A BRIEF SESSION OF QUESTIONS AND ANSWERS AND DISCUSSION ON WHAT WE HAVE HEARD.
AND THEN I WILL COME BACK FOR A CLOSING.
I'M GOING TO HAVE PRIVILEGE MODERATOR PRIVILEGE.
AND I WOULD LIKE -- AND YOU ALL CAN CRIME IN HOWEVER WAY YOU WOULD LIKE.
I WOULD LIKE TO KNOW IN YOUR RESEARCH OR IN YOUR TEACHING, HOW DO YOU INCLUDE EQUITY?
WE'VE HAD SOME VERY GOOD DISCUSSIONS ON EQUITY AND THE WAY WE PERCEIVE IT THIS MORNING.
HOW DO YOU INCLUDE EQUITY IN THE WORK THAT YOU DO?
YOU DON'T ALL HAVE TO RUSH AT ONE TIME.
DO I HAVE TO CALL ON SOMEBODY?
>> I'M HAPPY TO WEIGH IN.
I WILL WEIGH IN FROM THIS PERSPECTIVE.
THAT'S INCREDIBLY DIFFICULT FOR ME.
AS A WHITE, MIDDLE CLASS, MIDDLE AGED MALE, I'VE GOT TO LEARN A HUGE AMOUNT ABOUT HUMILITY TO INCLUDE EQUITY.
I'VE GOT --IF I WANT TO PARTNER, I'VE GOT TO REALIZE THAT I CAN'T BE THE ROLE MODEL.

I CAN BE A LISTENER.
I CAN SHUT UP AND LISTEN.
BUT FOR ME TO INCLUDE EQUITY, I HAVE TO BE INCREDIBLY INTENTIONAL ABOUT BEING HUMBLE AND LISTENING AND LEARNING FROM OTHERS.
SO I THINK ABOUT EQUITY THE SAME WAY I DO CULTURAL AWARENESS.
WHEN I GO TO ANOTHER COUNTRY I SPEND A LOT OF TIME LISTENING AND LEARNING.
AND WHEN I THINK ABOUT HOW DO I -- FROM THE PERSPECTIVE OF PRIVILEGE THAT I'VE LIVED, HOW DO I WORK WITH EQUITY, I HAVE TO START WITH A LOT OF HUMANITY MYSELF WE HAVE A LOT OF PEOPLE ON THE PANEL THAT WILL PROBABLY ANSWER ANOTHER WAY.
>> THANK YOU.
NEXT.
>> I WILL CRIME IN.
>> THANKS, MARCCUS.
>> I THINK HUMILITY IS THE FIRST STEP IN TERMS OF ADDRESSING EQUITY.
AND I THINK THROUGH MY WORK AND ONE OF THE PAPERS THAT I MENTIONED, YOU KNOW IN TERMS OF HOW I INCLUDE EQUITY IN MY PEDAGOGUE IS REALLY THROUGH SERVICE LEARNING OPPORTUNITIES AND PARTNERING WITH COMMUNITIES, YOU KNOW AND EXCHANGING IDEAS AND INFORMATION.
AND REALLY REFRAMING HOW WE THINK ABOUT KNOWLEDGE PRODUCTION AND RECOGNIZING THAT -- YOU KNOW COMMUNITY FOLKS ARE BRILLIANT IN THEIR OWN RIGHT AND HAVE AN INTUITION THAT WE CAN'T NECESSARILY ANTICIPATE FROM THE LITERATURE OR FROM RUNNING MODELS OR SECONDARY DATA.
THAT'S INCREDIBLY IMPORTANT IN TERMS OF -- YOU KNOW UNDERSTANDING COMPREHENSIVELY THE ISSUES THAT WE ARE ALL FOCUSED ON.
SO I THINK -- YOU KNOW THROUGH BOTH HUMILITY AS WELL AS SERVICE LEARNING OPPORTUNITIES AND PARTNERING WITH COMMUNITIES TO -- YOU KNOW PROVIDE A SEAT AT THE TABLE FROM THE VERY BEGINNING, FROM RESEARCH QUESTION FORMULATION TO ANALYZING THE DATA AND THEN INTERPRETS THE FINDINGS AS WELL AS -- YOU KNOW BEING ABLE TO BE IN FRONT OF STUDENTS AND BEING ABLE TO DISCUSS IDEAS AND THOUGHTS IS VERY CRITICAL IN TERMS OF EQUITY IN MY OPINION AND HOW I INCLUDE IT IN MY PEDAGOGUE.
>> VERY INTERESTING.
ANY -- PROFESSOR CAPPS?
I WILL LET DR. CORSI SHARE FIRST SINCE HE HAS HIS HAND UP.
>> I'M SORRY.
I DIDN'T SEE HIS HAND.
DR. CORSI.
>> I AGREE WITH EVERYTHING THAT DAN AND MARCCUS SAID ABSOLUTELY.
I WILL SAY WHEN I WAS AT THE UNIVERSITY OF TEXT PARTICULAR I HAD A FAIRLY LARGE RESEARCH TEAM WE WOULD DO LOTS OF RESEARCH BUT ALMOST ALL OF ANY STUDENTS.
MY GRADUATE STUDENTS AND PH.D. AND MASTERS STUDENTS, WE WOULD DO VOLUNTEER WORK IN THE COMMUNITY.
AND THAT WAS SORT OF EXPECTED OF THE GRADUATE STUDENTS.
AND WE WOULD WORK A LOT WITH SCHOOLS AND UNDERSERVED COMMUNITIES BOTH IN AUSTIN AND RIO GRAND VALLEY AND WE COULD GO TO THE SCHOOLS AND WORK TO IMPROVE INDOOR AIR QUALITY.
AND THREE OR FOUR YEARS AGO WE RENTED SOME BIG VANS AND HAD STUDENTS -- PICKED UP STUDENTS IN THEIR COMMUNITIES AND BROUGHT THEM TO THE UNIVERSITY OF TEXAS AND HAD THEM WORK IN THEIR LABORATORIES FOR A WEEK.
SO THEY GOT FAMILIAR WITH HOW TO WORK WITH TOOLS IN THE LABORATORY.
AND THEY HAD PROJECTS TO DO.

AND THEY ALL MADE PRESENTATIONS TO GROUPS OF FACULTY ABOUT WHAT THEY FOUND IN THEIR RESEARCH.
THAT THIS WAS ALL VOLUNTEER WORK.
AND IT TAKES A LOT OF TIME TO DO THOSE THINGS BUT IN ACADEMIA WE NEED TO CRAFT THAT TIME SOMEHOW IN OUR SCHEDULES.
AND AS UNIVERSITY DEAN I'M TRYING TO IMPRESS THAT ON OUR FACULTY TO DO MORE OF THOSE KIND OF THING.
>> VERY GOOD, THANK YOU.
ANYBODY ELSE BEFORE I GO TO THE NEXT QUESTION?
>> I WILL JUST JUMP IN QUICKLY.
I THINK THAT'S A WONDERFUL EXAMPLE PRACTICALLY.
AND IT'S BEEN DELIGHTFUL TO HAVE HIGH SCHOOL STUDENTS WORK IN MY LAB LEARNING COMPUTER SCIENCE SKILLS FROM MANY OF THE UNSERVED HIGH SCHOOLS IN PHILADELPHIA.
AND I THINK IF THERE ARE ANY OPPORTUNITIES IN THE FUTURE THAT WE PLAN TO SHARE RESULTS OF MODELING WITH A LOCAL MIDDLE SCHOOL.
BUT I WOULD SAY PRACTICALLY IT INFLUENCES MY EDUCATIONAL WORK PROBABLY MORE SO.
WE DO PROJECT BASED LEARNING AND FLUENT MECHANICS CLASS FOR CIVIL ARCHITECTURAL AND ENVIRONMENTAL ENGINEERS AND ALLOWING THEM TO CHOOSE REAL WORLD PROJECTS THAT SOMETIMES HAVE THESE EQUITY ISSUES TO CONSIDER, I THINK IS A NEAT WAY TO INN SCORE RATE IT IN SOME OF THE FUNDAMENTAL LEARNING.
WHEN THE ENGINEERS ARE DOING AS WELL AS SENIOR DESIGN PROJECTS.
SO A SENIOR DESIGN TEAM AND LEADING IS WORKING ON WATER, ACCESS TO CLEAN WATER FOR HAITIANS IN PORT-AU-PRINCE.
SO THESE ARE OPPORTUNITIES THAT THE STUDENTS REALLY HAVE TO TEST THEIR UNDERSTANDING OF DESIGN WITH EQUITY AS A COMPONENT OF IT.
>> THANK YOU.
I'M GOING TO ASK YOU ALL TO THINK ABOUT HOW YOUR RESEARCH IS MORE CONVERGENT.
AND I WOULD LIKE TO JUST THROW OUT THAT EQUITY ALSO IS HOW YOU TREAT YOUR COLLEAGUES AND PEOPLE THAT YOU WORK WITH EVERY DAY.
AND THINK ABOUT HOW YOU DO THAT -- JUST A QUICK STORY.
WHEN I WAS IN GRADUATE SCHOOL 100 YEARS AGO WE WERE ALL ON PUBLIC HEALTH SERVICE GRANTS.
AND WE WOULD ALL GETTING TO AT LUNCHTIME AND PLAY -- AND I WAS THE ONLY FEMALE AND THE AFRICAN-AMERICAN AND THE CONVERSATION WOULD INVARIABLY SOMETIMES GET AROUND TO WELFARE AND PEOPLE ON WELFARE AND I WOULD SIT THERE AND TAKE IT.
AND AFTER A WHILE I COULDN'T TAKE IT ANY MORE.
SO I JUST ASKED -- I SAID TELL ME SOMETHING.
THEY SAID WHAT, LILIA.
I SAID WHAT COLOR IS THAT CHECK YOU GET EVERY MONDAY?
THEY SAID WHAT IS I SAID WHAT COLOR IS THE CHECK YOU GET EVERY MONTH.
I DON'T KNOW.
I HAVEN'T LOOKED AT IT.
I SAID IT'S GREEN.
THEY SAID WHAT DOES THAT MEAN.
THAT'S THE SAME COLOR CHECK THAT WELFARE MOTHERS GET ALSO.
AND THEN THEY LEFT THAT CONVERSATION ALONE.
SO YOU HAVE TO THINK SOMETIMES WHEN YOU SAY THINGS YOU MEAN IT ONE WAY BUT IT COMES OFF OF ANOTHER.

AND IN SOME WAY WE ARE ALL VERY EQUAL.
SO JUST KIND OF KEEP THAT IN MIND.
I WOULD LIKE TO KNOW FROM A FEW OF YOU HOW CAN WE MAKE RESEARCH MORE CONVERGENT?
AND THEN I WILL OPEN IT UP TO THE FLOOR.
I'VE HEAR A LOT OF GOOD ANSWERS, DR. CORSI.
>> I WOULD SAY CONVERGENT RESEARCH IS MIXING PROBLEMS AND THE AIR QUALITY ONE IS ONE THAT DEAL WELLS REALLY COMPLEX PROBLEMS THAT HAVE NOT BEEN SIGNIFICANTLY STUDIED.
IT'S BEEN A WOEFULLY UNFUNDED AND UNDERSTUDIED FIELD FOREVER.
AND IT'S ALSO A FIELD WHERE HUMAN BEHAVIOR PLAYS A HUGE ROLE ON THE QUALITY OF ONE'S ENVIRONMENT.
MANY OF THE THINGS WE DO IN OUR OWN LIVES WE MAKE DECISIONS THAT END UP IMPACTING US IN TERMS OF INHALATION OF CHEMICALS AND THOSE KINDS OF THINGS.
ONE OF THE MOST REWARDING EXPERIENCES I'VE HAD IS INTERDISCIPLINARY EXPERIENCES, WORKING WITH FACULTY AND PSYCHOLOGY AT THE UNIVERSITY OF TEXAS IN AUSTIN, WHERE WE ACTUALLY DID PSYCHOLOGICAL TYPING OF INDIVIDUALS -- ABOUT 2,000 INDIVIDUALS TO LOOK AT LEVELS OF NEWER ROT SIMPLE OR OPENNESS.
AND TO SUPER IMPOSE THE ACTIVITIES IN THEIR INDOOR ENVIRONMENT THAT EFFECTS INDOOR AIR QUALITY AND GO INTO SOME OF THOSE ENVIRONMENTS AND LOOK AT TECHNOLOGIES THAT WEIGHS IT OUT.
SO WORKING ACROSS DISCIPLINES, UNDERSTANDING HUMAN BEHAVIOR, EVERYTHING FROM PSYCHOLOGY TO COMMUNICATE SCIENCE.
I THINK THESE ARE REALLY IMPORTANT INTEGRATIONS WE NEED TO MAKE AS AN ENGINEER TO BETTER UNDERSTAND HUMAN BEINGS WHERE THEY LIVE, WHERE THEY LIVE, WHERE THEY WORK, WHAT THEY DO TO TRY TO SOLVE COMPLEX PROBLEMS.
THAT'S JUST ONE EXAMPLE IN INDOOR AIR QUALITY.
>> THANK YOU.
SYBIL.
WE HAVEN'T HEARD FROM YOU.
DO YOU WANT TO WEIGH IN ON THIS?
>> YES.
I ACTUALLY HAD A GOOD ANSWER FOR THE PREVIOUS QUESTION TOO.
>> WELL GIVE US BOTH PROBLEMS.
>> NOT NESTLE A GOOD ANSWER.
BUT I TELL YOU ONE THING I'M REALLY CONCERNED ABOUT WITH ENGINEERS NOW.
BY THE TIME THEY COME INTO COLLEGE, THEY ARE EAGER.
THEY WANT TO DO GREAT THINGS.
THEY ARE SUPER ENERGETIC BUT THE TIME THEY LEAVE A LOT OF THEM ARE ROBOTS THAT CAN JUST APPLY EQUATIONS.
SO TO HAVE ME THINK ABOUT THEIR EDUCATION AND THEIR WORK IS SUPER IMPORTANT.
SO WHAT I'M TRYING TO DO IS -- NOT BEING AN EXPERT IN THE FIELD IS TO HAVE THEM TALK.
TO HAVE THEM TALK AND SHARE AND ESPECIALLY BECAUSE AT UIC IT'S A VERY, VERY DIVERSE POPULATION.
SO BY HAVING THEM JUST EXCHANGE IN LEARNING FROM THEIR PEERS, I'M HOPING IT'S HAVING A POSITIVE IMPACT ON THEM.
THAT'S ONE OF THE THING I'M DOING.
OR I'M TRYING TO DO.
AND AGAIN I'M A WHITE MALE.
SO THERE'S NOT MUCH I CAN DO.

PLUS -- NOT THE WHITE MALE PART BUT THE FACT THAT I'M FRENCH I THINK IMPACT ON THE SECOND ONE.
THE SECOND QUESTION.
BECAUSE I DON'T KNOW IF YOU KNOW THIS ABOUT FRENCH PEOPLE BUT WE ALWAYS HAVE TO DO SOMETHING IN A DIFFERENT WAY.
THERE'S A WAY TO DO IT, WE ARE ALWAYS GOING TO FIND A DIFFERENT WAY TO DO IT.
WE ARE ALWAYS REBEL.
WE ARE ALWAYS AGAINST ORDER WE ALWAYS, ALWAYS HAVE TO FIND SOMETHING DIFFERENT.
SO HERE I KNOW IT'S GOOD TO PICK A FIELD AND TO KEEP IN IT AND NOT TO BE CONVERGENT.
WHICH MEANS I AM CONVERGENT ALL THE TIME.
I'M AN ENGINEER SO I LOOK AT WASTE WATER AND ALL OF THEM.
WHENEVER I'M TOLD I SHOULD DO IT ONE WAY I MAKE SURE TO FIND ANOTHER WAY TO DO IT.
SO THAT'S ONE OF MY STRATEGIES TO CONVERGE AND THAT'S JUST BEING A FRENCH PERSON AND YOU CAN ASK ANY FRENCH PEOPLE.
WE HAVE AN EXPRESSION IN FRENCH WHICH IS THE EXPRESSION THAT PROVES THE RULE.
WHENEVER THERE IS A GRAMMATICAL RULE THERE'S ALWAYS, ALWAYS AN EXCEPTION.
SO WE ARE ALWAYS GOING TO BE THE EXCEPTION.
>> ABSOLUTELY.
I KNOW YOUR COUNTRY WELL.
AND YOU ARE ABSOLUTELY CORRECT.
I WOULD LIKE TO THROW A QUESTION OUT -- I THINK THEY'VE BEEN ANSWERED SO FAR.
I THINK MAYA, COLLEEN, ARE THERE ANY OTHER QUESTIONS?
IT LOOKS LIKE THEY HAVE ALREADY GIVEN THE ANSWERS TO THE QUESTIONS I SAW.
>> WE CAN STILL ASK QUESTIONS THAT WERE ANSWERED IN THE CHAT OR THE Q&A BECAUSE PEOPLE AREN'T ALWAYS ABLE TO READ OR ON YOUTUBE LIVE BUT WE DID HAVE A PRESUBMITTED QUESTION FROM FERNANDO ROMAN ON TWITTER.
HE SAID WHAT ARE SOME LOCAL METHODS TO HELP REMEDY AIR POLLUTION, ESPECIALLY IN DEVELOPING COMMUNITIES.
SO MAYBE DR. CAPPS OR DR. CORSI.
>> GO AHEAD, SHANNON.
>> THAT'S A GREAT QUESTION.
SO IN DEVELOPING COMMUNITIES, I GUESS I'M THINKING -- I MIGHT ADDRESS THE URBAN SIDE OF THAT IF YOU WANT TO TAKE THE MORE RURAL SIDE, DR. CORSI.
I THINK ONE OF THE MAIN ROUTES OF EXPOSURE TO OUTDOOR AIR POLLUTION IS AS PEOPLE ARE INDOORS.
SO SOME OF THE TACTICS THAT DR. CORSI INTRODUCED CAN ACTUALLY SIGNIFICANTLY HELP REDUCE EXPOSURE.
WHEN ONE'S HOME MIGHT BE POSITIONED BESIDE AN INTERSTATE WHERE MANY OF THESE NITROGEN DIOXIDE CONCENTRATIONS ARE HIGH AND HAVE BEEN ATTRIBUTED TO INCREASED INCIDENTS OF ASTHMA.
SO I THINK SOMETIMES BEING FIXED TO A PLACE MIGHT REQUIRE INTERVENTIONS THAT JUST ARE ADAPTATIONS REALLY.
BECAUSE THE AIR POLLUTION CAN'T BE CONTROLLED.
BUT I THINK ON A PERSONAL LEVEL, IF ONE IS CHOOSING HOW THEY OPERATE IN THAT SPACE, MAKING CHOICES TO NOT BURN FOSSIL FUELS.
SO EITHER WALKING, BIKING, TAKING CLEAN PUBLIC TRANSIT ROUTES IS ONE WAY TO MITIGATE CONTRIBUTING TO POLLUTION IN THOSE LOCATIONS.
AND THEN -- YEAH.

CHOOSING HOW YOUR ENERGY IS PRODUCED AS WE ARE ABLE TO DO IN PENNSYLVANIA MIGHT ALSO BE A WAY TO REDUCE INFLUENCES.
>> OKAY.
>> TO FOLLOW UP ON WHAT SHANNON SAID -- AND THIS WAS A PLUG FOR THE INDOOR AIR QUALITY FIELD, A SHAMELESS PLUG.
THE VAST MAJORITY OF AIR POLLUTION WE BREATHE DURING OUR LIFETIMES WE BREATHE INDOORS AND THAT IS EVEN TRUE FOR POLLUTION OF OUTDOOR ORIGIN.
SO MAKING THE INDOOR ENVIRONMENT HEALTHIER BY REDUCING POLLUTION LEVELS.
EVEN OUTDOOR POLLUTION IS IMPORTANT.
WE HAVE A CAREER FACULTY MEMBER OF PORTLAND STATE UNIVERSITY ELIAN GAL WHO HAS DONE GREAT WORK.
AND MIDDLE SCHOOL ALONG INTERSTATE 5.
LITERALLY ANY OF US CAN THROW A STONE AND HIT THE SCHOOL BUILDING FROM INTERSTATE 5, AND ELLIOTT WORKED WITH THEM FOR ABOUT A YEAR AND A HALF AND WORKED WITH PORTLAND PUBLIC SCHOOLS TO PUT IN PROBABLY ONE OF THE BEST FILTRATIONS IN ANY SCHOOL IN THE UNITED STATES AND DID REALLY EXTENSIVE TESTING BEFORE AND AFTER.
THE BENEFIT OF THAT NOW IN COVID TIMES IS THAT THAT SCHOOL IS PROBABLY THE SAFEST SCHOOL IN THE UNITED STATES WITH RESPECT TO PROTECTING STUDENTS FROM VIRUS-LADEN PARTICLES AS ONE EXAMPLE:
AND ELLIOTT PUT A LOT OF TIME INTO THAT, BOTH FUNDED AND UNFUNDED TO HELP THAT SPECIFIC SCHOOL.
>> DR. CORSI I WOULD LIKE TO ASK YOU -- OR ADD TO YOUR CONVERSATION THAT JUST REMINDED ME.
YOU MENTIONED THE MITIGATION OF TWO RAVAGES THAT THIS BOX FAN WAS SOLVING.
DO YOU REMEMBER THAT?
>> YES, I DO.
>> OKAY.
YOU LEFT OUT A VERY IMPORTANT THIRD ONE.
IS THAT YOU ARE PUTTING PEOPLE TO WORK.
SO YOU ARE STIMULATING ECONOMIC DEVELOPMENT AND BRINGING MONEY INTO THE ECONOMY AT A TIME WHEN RESOURCES ARE LOW.
SO YOU KNOW, PLEASE ADD THAT ONE WHEN YOU TALK ABOUT THE BENEFITS OF WHAT ARE YOU DOING.
BECAUSE YOU ARE BRINGING MONEY INTO THE COMMUNITY.
AND THAT IS SO VERY IMPORTANT.
>> THAT'S A FANTASTIC POINT.
GREAT POINT.
THANK YOU.
>> THANK YOU.
COLLEEN WE CAN TAKE ONE MORE.
>> THERE WAS A QUESTION SUBMITTED ON G MAIL TO DR. HENDRICKS ABOUT THE PARTICIPATORY ASSESSMENT TECHNIQUE.
JUST ASKING FOR MORE DETAIL.
WHAT THEY WERE MEASURING AND WHY ON THAT SLIDE.
>> SURE, YEAH.
HAPPY TO CHIME IN.
SO ESSENTIALLY -- WELL REALLY TO DOVETAIL MY RESPONSE TO ADDRESS ONE, THE CONVERGENCE.
BECAUSE I THINK IT'S RELATED TO THE DEVELOPMENT OF THIS PARTICIPATORY ASSESSMENT TECHNIQUE.

I WANT TO SAY QUICKLY, WHEN IT COMES TO CONVERGENCE, I THINK -- AS SCIENTISTS ACROSS DISCIPLINE WE HAVES TO RELEASE OUR EGOES AND UNDERSTAND THAT ROCKET SCIENCE IS ROCKET SCIENCE BUT MOST OF WHAT WE ALL DO ISN'T ROCKET SCIENCE AND EVEN WITH ROCKET SCIENCE I WOULDN'T UNDERESTIMATE THEIR ABILITY WITH FORMIDABLE TRAINING -- NOT NECESSARILY FORMAL TRAINING THAT, FOLKS CAN PICK UP CONCEPTS AND CONTRIBUTE IN WAYS THAT WE MAY NOT HAVE IMAGINED.
AND I THINK THAT'S IMPORTANT IN TERMS OF RELEASING EGO AND CREATING SPACE TO CONTRIBUTE BECAUSE AS AN IDEAL PLANNER IN PHYSICAL AND SOCIAL SCIENCE.
BUT I HAVE NO FORMAL TRAINING IN ENGINEERING.
ALTHOUGH I TOOK A FEW PH.D. LEVEL ENGINEERING COURSES DURING MY DOCTORAL PROGRAM.
BUT EVEN WITHIN THOSE CLASSES WITH NO PRIOR FORMAL TRAINING I WASES A ABLE TO PICK UP THE DISCOURSE AND PICK UP ON THE CONCEPTS AND KEEP PACE WITH FOLKS WHO HAVE BEEN IN ENGINEERING SPACES THEIR ENTIRE LIVES OR CAREERS.
AND WHAT I FOUND IS THAT COMMUNITY FOLKS FROM THE HIGH SCHOOL LEVEL UP ARE REALLY SORT OF -- YOU KNOW THE SAME WAY IN TERMS OF BEING ABLE TO PICK UP CONCEPTS -- YOU KNOW AND CONTRIBUTE REALLY MEANINGFUL THOUGHTS AND IDEAS WITH NO FORMAL TRAINING.
SO YOU KNOW, ESSENTIALLY WHAT I DID IS AFTER TAKING A FEW INFRASTRUCTURE ENGINEERING COURSES DURING MY DOCTORAL PROGRAM AND LEARNING THE WAYS IN WHICH PRACTICING ENGINEERS DO VISUAL INFRASTRUCTURE.
I TOOK THAT SAME INSTRUMENTAL TOOL AND SLIGHTLY MODIFIED IT FOR COMMUNITY PARTICIPATING.
SO WE DEVELOPED IS FOR COMMUNITY STANDARDS SO ON THE SURVEY COMMUNITY SCIENTISTS WOULD RESPOND IN TERMS OF PASS OR FAIL TO THESE PERFORMANCE STANDARDS WHICH WERE ESSENTIALLY DESCRIPTIONS OF PHYSICAL OR VISUAL QUALITY OF THESE DIFFERENT STORMWATER ASSETS.
AND THEN OBVIOUS REPLY WE HAVE SORT OF AN ALGORITHM BY WHICH WE CALCULATED EMPIRICAL SCORES RANGING FROM 0 TO 100 WITH 70 AND ABOVE BEING PASSING.
AND ANYTHING BELOW 70 BEING FAILING.
SO IT WAS REALLY JUST THE SAME TYPE OF SURVEY.
VISUAL INSPECTION SURVEY INSTRUMENTS THAT TRAINED ENGINEERS USE FOR CHEMICAL ENGINEERS ACROSS THE COUNTRY.
AND WE MAY BE A MILDER LANGUAGE CHANGES TO THE SURVEY INSTRUMENT.
AND THEN DEPLOYING IT AND HANDING IT OVER TO COMMUNITY SCIENCES TO DO THOSE SAME VISUAL INSPECTIONS.
>> OKAY.
THANK YOU.
WELL I GUESS IT'S A WONDERFUL DISCUSSION.
AND I GUESS IT'S TIME FOR -- TO CLOSE, TO CALL IT TO AN END.
THANK YOU SO VERY MUCH.
AND I JUST BRIEFLY IN CLOSING, IN ADDITION TO COMBATING CLIMATE CHANGE, THIS PANDEMIC HAS ALSO HIGHLIGHTED THE NEED FOR ENVIRONMENTAL ENGINEERS TO RETHINK, REIMAGINE AND DRASTICALLY IMPROVE THE QUALITY AND QUANTITY OF THE DELIVERY OF SANITATION SERVICES.
AND YES, I SAID SANITATION SERVICES TO THE MOST VULNERABLE POPULATIONS WORLDWIDE.
ACCESS TO SAFE, HIGH QUALITY AND ABUNDANT SANITATION SERVICES WILL IMPROVE THE ABILITY FOR HUMANS IN CARRYING OUT NORMAL BODILY FUNCTIONS TO SLOW THE SPREAD AND REMAIN HEALTHY.
THANK YOU.

COLLEEN YOU MAY TAKE IT AWAY.
>> THANK YOU VERY MUCH, DR. ABRON FOR YOUR WONDERFUL MODERATING.
WE ARE SO LUCKY TO HAVE YOU MODERATE THIS SESSION AND THANK YOU SO MUCH TO OUR DISTINGUISHED PANELISTS AS WELL FOR ALL OF THEIR CONTRIBUTIONS.
IT'S HARD TO BELIEVE THIS IS THE LAST SESSION:
BUT THE WORK WILL CONTINUE THROUGH AEESP AND EVERYONE'S RESEARCH AND TEACHING.
SO I WILL JUST SHARE SOME CLOSING SLIDES HERE:
SO PLEASE REMEMBER TO TAKE THE SESSION 6 QUIZ.
SO IT'S THE FINAL QUIZ.
AND YOU CAN STILL TAKE THE PREVIOUS QUIZES.
WE WILL KEEP IT OPEN FOR A COUPLE WEEK AFTER THIS CONFERENCE.
REMEMBER YOU CAN EARN A CERTIFICATE IF YOU SCORE 80% OR BETTER FOR ALL THE QUIZES.
SO THIS IS A GREAT OPPORTUNITY FOR YOUR RESUMES, FOR YOUR CVS AND JUST YOUR OVERALL EDUCATION OF I HOPE YOU HAVE LEARNED A LOT THROUGHOUT THIS WHOLE SESSION.
AND JUST WANT TO EXPRESS MY DEEPEST CONDOLENCES FOR ANYONE THAT IS ON THIS PANEL OR ATTENDING IN GENERAL, TO THOSE WHO HAVE LOST FAMILIES FRIEND AND LOVED ONES DUE TO COVID-19.
AND DUE TO ENVIRONMENTAL POLLUTION, WASTE AND CLIMATE CHANGE OVER 250,000 IN THE UNITED STATES.
1.3 MILLION THROUGHOUT THE WORLD.
PLEASE STAY SAFE AND VIGILANT.
ESPECIALLY THOSE IN THE UNITED STATES FOR THE THANKSGIVING HOLIDAY.
AND EVERYONE FOR THE HOLIDAYS COMING UP IN NOVEMBER AND DECEMBER.
WE HOPE THAT WE CAN GET THROUGH THIS.
AND WE ARE -- ENVIRONMENTAL ENGINEERING AND SCIENTISTS ARE WORKING DILIGENTLY TO HELP.
AND THESE FLAGS REPRESENTING EACH LIFE IN THE UNITED STATES DO NOT REFLECT THE DISPROPORTIONATE IMPACT IT HAS HAD ON BLACK AND BROWN COMMUNITIES AND WE ARE VERY SORRY FOR YOUR LOSS.
AND HOPEFULLY WE CAN BUILD BACK BETTER AND FIND SOLUTIONS TO MITIGATE FUTURE PANDEMICS AND THE IMPACT OF CLIMATE CHANGE.
SO WE WOULD LIKE TO SAY THANK YOU TO ALL OF OUR SPONSORS AND NATIONAL SCIENCE FOUNDATION FOR THE FUNDING TO DO THIS GRANT IN OUR INSTITUTIONS AND AEESP.
AND WE LOOKING FORWARD TO CONTINUING THIS CONVERSATION EVEN AFTER THIS VIRTUAL SERIES IS OVER.
AND YOU CAN STILL WATCH ASYNCHRONOUSLY FOR ANYTHING YOU HAVE MISSED OR TO REWATCH IF YOU WANT TO.
SO THANK YOU SO MUCH AND THANK YOU FOR THIS OPPORTUNITY TO CO-HOST THIS SESSION.
AND THANK YOU TO DR. MAYA TROTZ FOR ALL HER LEADERSHIP AND TO ALL OF HER ORGANIZERS AND THE CLOSED CAPTIONERS AND THE SIGN LANGUAGE INTERPRETERS.
>> THANK YOU.
I ENJOYED IT.
>> THANK YOU.