

# THE JOURNAL

INDIANA ENVIRONMENTAL HEALTH ASSOCIATION, INC.

## Spring Conference “déjà vu”

New year, same issue. The ongoing pandemic has forced the cancellation of the in-person IEHA Spring



The conference that almost was. The Seasons Lodge and Conference was to host the conference, until COVID-19 forced cancellation.

Educational Conference again. While conference chair Jennifer Heller had high hopes, along with members, to meet face to face for the annual one day event, the pandemic is still widespread and gathering together was just too risky. And with many members involved in COVID-19 vaccination clinics, along with budget restraints, many members might not have attended.

But all is not lost. Jennifer says she is working on a virtual event that will include two speakers, the required business meeting, and will run about a half day.

Since both conferences were cancelled in 2020, the Spring Conference business meeting was to be expanded to allow time to present the physical achievement awards, not presented at the fall conference. The physical presentation of the 2020 awards will be done later. Each chapter has been asked to make a presentation on their chapter activities during the past year.

There will be no fee for the conference but attendees will need to register a valid email address necessary to receive the link to attend.

Detailed information will be sent to members with valid email addresses on file with the association.

## Fall Conference on track

As of now, the Annual Fall Educational Conference is still scheduled as an in-person event at the Lawrenceburg Event Center in Lawrenceburg, where it would have been held in 2020. The dates are September 20 to 22.

Conference chair Holley Rose anticipates a return to the general sched-

ule of past conferences. That will include breakout sessions for food protection, wastewater, and general environmental health services. The awards banquet would return to Monday evening. But this all depends upon the COVID situation.

Pre-conference events will be planned for Sunday preceding the conference.

### Special points of interest:

- **The pandemic forced a second cancellation.**
- **The conference will be held virtually and last about a half day.**
- **There will be no fee to attend, with IEHA absorbing any costs.**

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## From the Ed desk

Here's the latest IEHA Journal for you to enjoy. As we've all lived through one year of the COVID-19 pandemic, new words have crept into our vocabulary. One of those words is "normalcy". What does that mean? Something different to each of us, I think.

One thing I've tried to accomplish is keep the Journal going in a way that might provide a bit of "normal" in what has been a busy and chaotic year. Please let your views be known, and ideas are always welcome.

Please do note IEHA and Journal sponsors as you read through.

*Ed*

## Where are the used masks going?

**"Global production reached 1.5 billion face masks in 2020. This translated to over 1.5 billion discarded masks going into earth's oceans."**

Plastic pollution to the world's waters has not abated, continuing the threat to marine wildlife and ecosystems, as plastic production continues to rise. Plastic doesn't break down, but accumulates, merely breaking into smaller and smaller pieces that kill marine life when consumed. *OceansAsia*, a marine conservation group, has identified a new source of water pollution - plastic masks that have been worn to combat the COVID-19 pandemic, and discarded. The growing widespread use of PPE (personal protective equipment), mostly face masks, then gloves, has also led to increased waste, says *OceansAsia* in a recent report, citing a doubling of production in the past two years.

The group says that with single-use masks made from a variety of plastics, are difficult to recycle because of both composition and possible contamination and infection. Used masks get into oceans when improperly discarded, either from inadequate or non-existent waste management systems, or when these systems are overwhelmed. *OceansAsia* says that using a global production estimate of 52 billion masks, this means 1.56 billion discarded masks would get into oceans in 2020. This translates to upwards of 6 thousand tons of plastic pollution.

*OceansAsia* says one way to address this problem is to migrate away from single use plastics toward reusable (cloth) masks, and masks made from sustainable materials including non-plastic alternatives. Some innovative designs have come on the scene including self-cleaning masks. But better disposal of used masks is needed, plus ways to extend to life of single use PPE.



Gary Stokes, *OceansAsia*'s director of operations, holds discarded face masks retrieved from the ocean.

## “Protect Purdue Plan” working

With the COVID-19 pandemic threatening, how can authorities keep 46,000 Purdue University students safe? Eric Butt, Director Environmental Health and Public Safety at Purdue, outlined the school’s extensive plan to members of the Wabash Valley Chapter recently.

“We took on the risks and challenges early in the pandemic,” Eric said. Staff created the “Protect Purdue Plan” which emphasized personal responsibility to follow health safety practices and protocols.

The plan can be viewed on Purdue’s website that includes a “dashboard” with current COVID-19 numbers, including on-

going surveillance testing of staff and students, and the results. Purdue has created a quarantine and isolation area for those who require it.

Eric said that good communication and clear guidance was critical to the success of the plan. Students and staff were all required to sign a pledge to “protect myself, others, and the Purdue community.” He added that the acceptance from all those on the Purdue campus has been very good.

Purdue has had to go to a hybrid education plan, while maintaining some on campus activities. Seventy percent of students and staff are either fully or partially remote.

The expected protocols of social distancing, masks, and shielding, are all in place in classrooms. To enable rapid contact tracing, any cell-phone connected to Purdue’s campus wi-fi can be traced to learn who was present at any given location, and when.

Since Purdue has a quarantine and isolation area, a device was invented by Purdue to use intense ultraviolet light on a robot to add additional protection between guests. UV light can destroy the virus.

Eric said that since Purdue was proactive early on, Purdue has the most students in classrooms of any Big Ten school.

# PROTECT PURDUE

“Everyone was asked to sign a pledge to “protect myself, others, and the Purdue community.”

## Drinkable water from “dry” air

Researchers at MIT have refined a system developed several years ago that can extract drinkable water from air, even in dry areas, offering a possible water source in areas of the world that have limited or no safe water available.

As reported in *MIT News*, the original device uses an absorbent material to collect moisture on its

surface at night and release it the next day. The material is heated by the sun at the top, and the underside that is shaded releases water back into the absorbent material that can be collected.

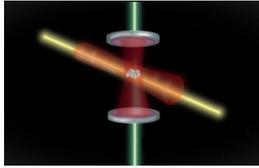
Researchers have refined the method by using a second stage of absorbent material to significantly increase the water output. The mate-

rial used is zeolite, composed of microporous iron aluminophosphate, a material that is widely available.

Atmospheric water harvesting has not been widely pursued, researchers say, but could even extract water in air with humidity as low as 20%. It requires nearly no energy.



In the prototype, the black collecting plate faces the sun and water produced flows into two glass tubes below.



Atoms are trapped in an optical cavity comprised of two mirrors. Hit with a laser, the atoms are entangled and their frequency can be measured by a second laser.

## New atomic clock extremely accurate

MIT physicists say they have just the clock for you, if you want extreme accuracy. The new atomic clock is so accurate, they claim it would only be off by 0.1 seconds - in 14 billion years!

As shared on [www.studyfinds.org](http://www.studyfinds.org), a more accurate clock might allow scientists to detect dark matter and

gravitational waves, which have so far been elusive. While other atomic clocks use randomly oscillating atoms, MIT says the new technique uses an unusual phenomenon, quantum entanglement. This happens when separate particles link to each other, which leads to more precise measurement of time in a shorter period.

While current clocks use cesium atoms for measurement, new techniques use the element ytterbium, which vibrate about 100,000 times more often per second. Measurement requires cooling and trapping atoms in an optical cavity, which is then hit with lasers. A second laser is used to measure their resulting frequency.

**“The new process can more efficiently break down waste plastics into usable fuels, helping oceans and landfills.”**

Plastic waste has plagued the planet for decades. It pollutes the oceans and is harmful to aquatic life, fills landfills, and takes many years to break down.

*ScienceDirect.com* has reported on a new low temperature catalyst process that can break

down plastic into liquid fuels and waxes, without using a lot of energy doing so. It was developed by researchers at Tohoku and Osaka City Universities.



The process uses the metal ruthenium, and

cerium oxide to break down plastics with an efficiency of nearly 90%. Most of the result was liquid fuel and the remainder wax.

The process could be useful in reducing the plastic waste problem and could have a positive impact on recycling.

## Temperature “tipping point” coming



A new study says earthlings may be running out of time to address climate change. Researchers from Northern Arizona University, the Woodwell Climate Research Center, and New Zealand’s University of Waikato, have identified a critical temperature tip-

ping point, beyond which the ability of earth’s plants to store carbon will be inadequate. As reported at *phys.org*, the terrestrial biosphere that include plants and soil microbes, exchange carbon dioxide and oxygen, and has been able to take in

more carbon than is released, mitigating climate change. But as global temperatures rise, that won’t continue, and carbon release will accelerate. Scientists aren’t sure exactly what average temperature will tip the biosphere, but don’t doubt it will happen.

## Southern Chapter has virtual meeting

The Southern Chapter met virtually March 1, but no business was conducted due to the lack of in-person attendees.

Jennifer Heller discussed some ongoing environmental issues in Panama after her recent trip, including how Panama City is growing into adjacent flood areas. Jennifer also shared info about waste water treat-



ment, and problems with migration of animals through the city and adjacent areas. She noted there are 2,300 species

Panama City (left) is encroaching into flood areas (right), including around the Chagras River. The palm tree (below) grows near the Gamboa Resort, a scenic spot in Panama.



of trees in the canal region, but also talked about issues with mosquitoes and yellow fever, a mosquito borne illness.

(Photo credit: Jennifer Heller)

## Are you eating plastic and don't know?

The answer to that question most certainly is yes, and so are all other creatures. These are not chunks of plastic but the microscopic bits of plastic that are everywhere.

A recent study outlined in *Environmental Science and Technology*, says humans are likely consuming 50,000 microplastic particles every year, plus plastic particles that are inhaled. The total could be over 74,000 tiny plastic bits. Just consuming the recommended amount of water daily could mean people are ingesting 4,000 bits of plastic.

### Toxic to people?

Does eating all that plastic harm the body? Does it get into the bloodstream? Or do the micro

particles pass through harmlessly? The answer is that no one knows, but some studies indicate that the cumulative effect of eating so much plastic might be toxic, with different types of plastics exhibiting different toxic properties.

Some plastics absorb chemicals, like lead, from the environment, while others are manufactured using toxic chemicals like chlorine. It's not known how this all might affect the human immune system.

### Where do plastics come from?

We all know that plastic containers are polluting landfills, oceans, and waterways. What seemed like a miracle when first developed has become a serious issue

because some of plastic's serious selling points like "long-lasting", is now a problem with plastics just breaking down into smaller and smaller bits.

But a new study by ocean pollution researcher Peter Ross from the Ocean Wise Conservation Association of Canada reveals that a new source of plastic contaminants in oceans, is coming from our clothing. Washing clothes shed polyester and synthetic fibers into waste water that finds its way into the oceans. This totals over 20 billion microfibers a year.

"We live in a cloud of plastic dust," Ross says.

**"People are likely eating and breathing upwards of 74,000 microplastic particles each year. How toxic is this?"**



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## Do you know the oldest fast food chain?



The fast food eatery that has been around the longest is probably not the one you're thinking. Is it McDonald's? Wendy's? Burger King? Nope. There's another chain that is celebrating its 100th birthday in 2021 - White Castle!

Although it's been passed by in the numbers of other restaurants, White Castle still exists as a family owned enter-

prise, now in its fourth generation. In 1921, according to the company website, the first facility began in Wichita, Kansas, with fonder Billy Ingram selling small, square hamburgers for just a nickel each and was considered an influence on the industry at the time.

But White Castle's number of restaurants remains small at around 400 places in just over a dozen states mostly along the East Coast,

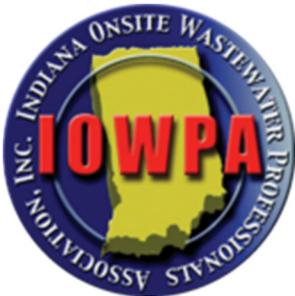
Midwest, and Florida. The chain employs about 10,000, compared with the much larger Subway, with over than 35 times as many workers.

The website *eatthis.com* reminds us that White Castle predates McDonald's by almost 20 years, and others like Burger King and KFC didn't come on the scene until the 1950s. The website also reports that the limited number of locations is by design.

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## Can “scrubbing” the air work?



Scientists agree that climate change is a direct result of carbon dioxide gas being released into the atmosphere. In January, airborne CO<sub>2</sub> was measured at 415 parts per million, the highest level ever recorded in human history.

But the Intergovernmental Panel on Climate Change says that reducing emissions by itself won't be enough to keep dangerous levels from rising higher. As report-

ed by [www.thenextweb.com](http://www.thenextweb.com), action must be taken to remove CO<sub>2</sub> already in the air, a process described as “negative emissions.”

Two ways to accomplish this is carbon storage in natural ecosystems, and a method called direct air capture (DAC). The latter takes CO<sub>2</sub> from the air and store it, or make usable products from it. Published reports say climate change can be slowed by deploying many “CO<sub>2</sub> scrubbers” by DAC.

But is it worth the cost? The answer may be a matter of opinion, but such systems are already being used. In France, scrubbers powered by geothermal energy produced by burning waste air are drawn through special filters.

Meanwhile, a Canadian company is using giant fans to draw air into a structure where it passes over a potassium hydroxide solution that chemically binds the CO<sub>2</sub> molecules removing them from the air.

## Wildfire smoke poses new risks

“Aerosolized microbes, spores, and fungal conidia survive the heat and can travel hundreds of miles.”

Wildfires can lead to more health risks than earlier known. Scientists now say that more than smoke particulates and flames can shoot into the air from the rising heat, then settle into low areas when cool. Countless microbes are also being transported that living creatures can breath in, or will adhere to clothes.

Leda Kobziar, PhD, wildlands fire science director and head of the Kobziar Fire Ecology Lab at the University of Idaho, believes there is not a clear understanding that the trillions of microbes in smoke pose

a risk to human health. In her research so far, she described the diversity of microbes found as “mind-bending.”

Wildfires, which burned over 10 million acres of the country last year - almost half in California - accounted for nearly half of the fine particulates polluting the air in the West. Although long-term studies show the negative effects of urban air pollution, little is know about the harm wildfire smoke causes.

Dr. Kobziar says that the microbes are not just



from the smoke, but the fire control techniques that include digging into the soil to stop flames from spreading, releasing hidden microbes into the air. She adds that aerosolized microbes, spores, and fungal conidia survive the heat and can travel hundreds of miles to be inhaled by those downwind.

## Mars rover has Hoosier connection

The mission to the planet Mars leading to the successful landing of the Perseverance Rover has a direct link to an Indiana company.

Hayes International, headquartered in Kokomo, provided its *Haynes 230* alloy that, according to the company, was used in the descent thrusters of the Sky Crane vehicle that low-

ered Perseverance onto the planet's surface.

This alloy was used because of its "excellent high-temperature strength, thermal stability, and environmental resistance," according to the company website. It is made of a nickel-chromium-tungsten-molybdenum alloy that can handle oxidizing environments, and sur-

vive temperatures as high as 2,100° F. It has low thermal expansion while handling the extreme conditions on Mars.

NASA launched the rover on July 30, 2020 and it landed on Mars February 18, 2021.

Hayes International has facilities in several states and countries around the world.



NASA illustration of the rover landing on the planet Mars.

## How one LHD handled COVID clinics

As most local health departments deal with vaccination clinics, Wabash Valley members heard how one of its counties dealt with clinic logistics there.

Claire Haughton, Health Educator and Public Information Officer, gave a detailed look at how

Boone County set up its clinic, and the lessons learned from the event. She said that each clinic location was allowed to set up clinics as they liked, as long as basic protocols were followed, like proper preparation of the vaccine.

Claire added that get-

ting volunteers was no problem - more than they needed - but they made sure to have food available. It was important to keep them hydrated, she said, during their six-hour shifts.

They also used a smart phone chat app to connect with everyone.

**"It was important to keep all the volunteers hydrated during the six hour shifts."**

## Bats understand "social distancing"

We have learned that as part of stopping the COVID-19 pandemic, social distancing - keeping space from other people - is key to stopping the spread of the virus.

But it turns out that we are not alone in under-

standing this. A recent study in *Behavioral Ecology* found that vampire bats also understand the importance of space to stop disease spread. In one study, some bats were injected with an "immune challenging" substance whereas a control group received a

saline solution. Proximity sensors determined that the "sick" bats spent less time near other bats and were less "socially connected" and in general, spent less time near other bats.



## What happens to old EV batteries?



Components in electric vehicles can be recycled. They contain plastics to precious metals.

As the world's vehicles slowly shift from petroleum powered to renewable fuel to combat climate change, the number of electric vehicles (EV) and trucks on roadways is growing. This growth means more batteries and leads to the question of what to do with the old EV batteries.

As EV's increase on the road today, many will soon find their batteries reaching the end of their lives, and with potentially many millions of EVs on the road in a few years, that's a problem to address.

The Union of Concerned Scientists (UCS) reports that the tailpipe emissions account for much of the environmental impact from vehicles, EVs

do contribute some to emissions from what UCS terms as "upstream", meaning prior to operation. That is, the energy used to make the batteries causes some pollution. Also, the mining of minerals used in EV batteries can consume resources, like water, and can have negative impacts on the communities' health.

Several minerals are used in EV batteries, including Lithium, Cobalt, Nickel, Graphite, and Manganese, none of which are mined in North America. These minerals are rare and in finite supply so extracting these materials from used EV batteries makes economic and environmental sense. If not reclaimed, key supplies of these materials might be exhausted in fifty years, says USC.

"When a EV battery reaches the end of its life, it must be processed, repurposed, recycled, or disposed of," says USC. Extracting materials from used batteries will reduce the environmental impact of mining needed minerals.

Although used EV batteries might no longer be capable of powering vehicles sufficiently, they could still have as much as two-thirds of its original power remaining, enough to run, say, charging stations.

A lack of recycling facilities - fewer than a dozen EV recyclers exist worldwide - can mean too many EV batteries end up in warehouses. Setting recycling standards and policies for disposal will make EV batteries more sustainable.

**"Minerals used include Lithium, Cobalt, Nickel, Graphite, and Manganese, none of which are mined in North America."**

## Company to make food from air



A new Finnish company, Solar Foods, plans to open a new facility to produce commercialized food products made from "Solein", an edible protein made from air and electricity.

*The Spoon.tech* reports the company captures

carbon dioxide from air, then combines it with bacteria to form single-celled proteins based on natural fermentation. Solar Foods cites one advantage of its process over other alternative proteins is that it doesn't need land or irrigation to grow. And there's plenty

of carbon dioxide.

The company sees infinite potential for the product as a food ingredient for current foods, and foods not yet known.

While there is little competition, a U.S. company, Air Protein, is also developing products.

## New invasive mosquito found in Florida

Scientists have found a new mosquito species invading Florida. As reported by *NPR*, Lawrence Reeves, epidemiologist and researcher at the University of Florida, identified *Aedes scapularis* among mosquitos collected near the Everglades. Mosquitos were caught with traps baited with dry ice, which is made from carbon dioxide. The gas emitted

when the dry ice melts draws the mosquitos.

Follow-up studies found the invasive species prominently in counties around Miami. This species had previously been known to exist in Latin America and the Caribbean, but not here.

One concern with this species is that it can be found indoors as well as outdoors, and will seek a

blood meal from people and birds. This makes it a prime threat to spread diseases, and what's termed a "spillover" event. COVID-19 was believed to have started in bats before spreading to people.

Mosquitos carrying virus strains have lead to illness outbreaks, like Zika Denque, that have been found in Florida.



The *Aedes scapularis* mosquito has been found in the Sunshine State.

## Lake Michigan warming is troubling

A new study designed to study Lake Michigan at its deepest has found that the big lake is getting warmer hundreds of feet below the surface, and this could indicate we are losing our winters, says the National Oceanographic and Atmospheric Administration (NOAA).

NOAA says the Great Lakes have a huge impact on the nearly 35 million people who live near them. Scientists believe the lake's environmental conditions are sentinels for climate-driven changes. The long-term study that included looking at data from the last 30 years by the Great Lakes Environmental Research Laboratory looked at seasonal patterns and found that



Scientists deploy a "thermistor chain" for long term temperature monitoring in southern Lake Michigan 22 years ago.

what happens to the lake's surface during the summer has an impact Lake Michigan's deep waters during the winter, and those waters are warming. The change has been reflected by

winters becoming shorter, further leading to permanent changes in the seasonal patterns.

Warming could lead to alterations in fish production and even recreation along the lake shore. The long term study enables scientists to know how the climate change is affecting the Great Lakes region, and by extension, Earth's other large fresh water bodies.

The deep water studies enable scientists to see how large fresh water lakes respond to climate change that they can't determine from surface buoys, satellites, or from water samples. Michigan has been the only lake with long term deep water observations.

**"Deep water studies give climate data scientists can't get from surface buoys, satellites, or water samples."**



Lake Michigan is warming and NOAA says that's not good.

**IEHA is an Indiana not for profit corporation since 1951.**

IEHA  
PO Box 457  
Indianapolis, IN 46206-0457

Phone: 317-797-3255  
Email: [info@iehaind.org](mailto:info@iehaind.org)

Journal editor:  
[fsio99@gmail.com](mailto:fsio99@gmail.com)

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*"The Mission of the Indiana Environmental Health Association, Inc. is to promote, preserve and protect environmental public health in the state of Indiana, and to encourage a spirit of cooperation among all environmental health stakeholders while serving its members in the regulatory, industry, and academic communities."*

## More about IEHA



The Indiana Environmental Health Association, Inc. (IEHA) was founded in 1951 as the Indiana Association of Sanitarians (IAS). There were 16 charter members. The name was officially changed to the

Indiana Environmental Health Association in 1985. IEHA is affiliated with the National Environmental

Health Association (NEHA), and the International Association for Food Protection (IAFP).

IEHA is comprised of eight regional chapters. They are Central, East Central, Northeast, Northwest, Southeastern, Southern, Wabash Valley, and West Central. There are four standing committees, which include Food Protection, General Environmental Health Services, Terrorism And All Hazards Preparedness, and Wastewater.

The operations of IEHA are governed by an Executive Board that meets regularly. The Board and various standing committees are made up of voting and non-voting members. Information plus meeting dates, times and locations for the chapters and standing committees may be found on the IEHA website listed on this page. All meetings are open to any member or guest but only "voting members" may vote or hold an office.