Nature Discovery WILD TIMES

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THIS ISSUE

Prometheas in Flight = Late-Afternoon Delight

Promethea Moths copulate, clinging to the female's cocoon.

June is 'Giant Silk Moth Month' in Michigan.

The family, Saturniidae, contains the largest, most impressive moths in the world. With a wingspan up to seven inches the Cecropia is the largest moth in Michigan and in all of North America. With wingspans nearing six inches, Michigan-native Polyphemus and Imperial moths are impressive in their own right.

The wingspan of the Luna Moth tops out well-short of five inches - although very large within a wide world of moths, relative middling dimensions for a giant silk moth family member. Yet, there is little doubt; among the general public the Luna is surely the most widely known and recognized of the saturniids. Its unique coloration may have a lot to do with it. Indeed, a scan through over a hundred thousand moth species in the world turns up a relative handful of green ones. The 'tails' - extensions of the hind wings that trail behind the Luna in flight - compound its distinction. Ask most any person if they've heard of the Luna Moth and you're likely to get a nod.

A male Luna clings to Black Walnut foliage.

Ask the same person if they've ever heard of the Promethea Moth, a Michigan-native only slightly smaller than the Luna. You'll likely receive something akin to a puzzled, *Huh?* If its unusual coloration lends to the Luna's notoriety, perhaps the colors of the Promethea Moth contribute to its relative obscurity. In keeping with the vast majority of other moths, Promethea wings flutter within the 'earth tones' niche of the spectrum; thus, visually, it is less likely to stand apart from the crowd.

The Cecropia, Polyphemus and Luna moths are sexually monomorphic in relation to color and pattern. Other moth species exhibit sexually *dimorphic* coloration, including

the Promethea. Indeed, viewing a male and female separately, an uninformed observer could easily assume them to be different species. The wings of a female are generally colored around the milk-chocolate end of the 'earthy hues' spectrum. The male is darker; so let's say closer to semi-sweet.

Behaviorally, there also seems to be a dimorphic disconnect between the sexes. The male flies during the day, but the female flies strictly at night. A seeming-conundrum at first mention (*How do they ever find each other?*) comes into logical focus with a bit of knowledge about giant silk moth life histories, in general:

1. The adult form is the shortest lap of a giant silk moth's four-stage life cycle. It is functional for only a handful of days before it weakens and dies.

2. Therefore, no giant silk moth feeds during the adult stage. All the energy available to power the reproductive phase has been derived from that accumulated in its ravenous larval stage.

A male Polyphemus - eclosed from its cocoon just hours earlier - awaits its post-sunset release.

3. Within hours of emerging from the cocoon and expanding her wings, a female giant silk moth will get quietly busy, releasing a pheromone into the air in order to attract a mate. She remains perfectly still throughout the process as long as she is not disturbed, such that distant males that pick up her scent can more easily zero-in on their target.

4. Specific to species, the female is genetically-wired to release her pheromone through a small circadian window of hours. For most giant silk moths the window opens and closes during the night. Thus, stimulated by the pheromones in the air, the males fly only then.

Unusual for a giant silk moth, though, the Promethea female's pheromone-release window occurs while the sun is still high above the western horizon. Ergo, male Prometheas fly only in late afternoon. Soon after dark, then, the mating moths decouple and the female takes wing to seek the foliage of specific trees on which to secure now fertile eggs.

Although the sexes across virtually the entire moth world find each other through this 'scent-and-seek' strategy, the vast majority of species are not very watchable to us, largely for one or both of two reasons…

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First, **the lion's share of moths around us are small and relatively nondescript**; therefore, overlooked by your basic non-lepidopterist (i.e., nearly everyone).

For instance, over the summer I often see females of the miniscule Indian Meal Moth perched on the wall usually not far from the wild birdseed bucket inside our nature center door. Barely more than a quarter inch in length, they metamorphose from little white larvae that feed on the seed inside. Almost daily, when I open the lid a few meal moths wisp like dust motes past me and into the air.

We make no effort to control the meal moths. Rather, we view their presence as convenient. When Carol or I have the inclination, we'll pick up an insect net and sweep a half dozen from the walls and air around the room, then turn the net inside-out into a small tank that houses three Spring Peepers. The moths disappear within seconds amid a frenzy of tiny, directed hops.

Purposefully-close inspection of a particular meal moth on the wall may reveal the tip of its abdomen curled upward from between partially open wings; a telltale sign that it is a female in the midst of pheromone-release. An hour later, she may well have already attracted a mate. The male rests on the wall facing the opposite direction as they copulate - abdomen tips coupled and wings overlapped.

Secondly, in most moth species the female releases the pheromone during nocturnal hours; making her much less convenient to view, or even to find for that matter. Although humans cannot smell it, one can notice when a female of a larger moth species is releasing the pheromone. Her fleshy ovipositor - the source of the chemical scent – distends noticeably from the tip of the abdomen during the process.

On a specific day in June a female Cecropia or Polyphemus will emerge from one of our cocoons. At dusk, I place her in a specially-fashioned chickenwire 'mating cage' (See 'I Know Why the Caged Moth Mates': http://naturediscovery.net/pdf/WILD%20TIMES%20June17.pdf).

The gaps in the mesh are large enough such that a wild male's abdomen can easily unite with hers, but small enough due to the size of her wings that she cannot get out. On many June nights I've stepped outside at odd hours after midnight to not only check on the progress, but to attempt a quality photo or video.

The female Cecropia casts her pheromone just before first light.

The results have been generally disappointing. Light must be cast onto the moths in order to focus the camera. When I turn on a flashlight, the bright beam invariably disorients the incoming male. He changes course and flies toward the light, flapping wildly around me instead of toward his intended target.

On the other hand, the Promethea's diurnal proclivities place it among the finest of lepidopteran subjects for the nature photographer. Unlike a nectaring butterfly - a wrong move around which may send it flitting away - the female Promethea fresh out of the cocoon on a warm June day will stay put indefinitely, seemingly oblivious to your movement around her.

If the videographer sticks around through late afternoon, the real show begins. Don't dare look away for long, though. When she is releasing the pheromone I've seen a male suddenly materialize, zip up to her and initiate copulation within seconds.

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A Promethea cocoon dangles from a winter twig donning a leaf like a crumpled cape.

Creating opportunities for people of all ages to have positive experiences and interactions with various forms of local wildlife is a Nature Discovery hallmark. We believe (and decades of experience has borne this out) that a benign, close-up interaction with an individual of even one of the most squeamish-inducing, feared, or reviled creatures generates a metamorphosis in one's attitude toward the species whenever it is encountered thereafter in its wild state. Hence, arises an attitude of understanding, tolerance, appreciation, and, above all, a will to champion its continued existence. Past newsletter columns are loaded with examples, from spiders and horse flies to snakes and snapping turtles.

Over many years I could take a walk or jog around our few-mile 'country block' over the winter months and locate about a dozen Promethea cocoons. They hang like large silky tear drops from the outermost twigs on low limbs of small, scattered roadside Wild Black Cherry, Sassafras and White Ash trees, their common larval food trees. Most are cloaked in a dried brown leaf from the tree, serving to reduce their conspicuousness.

Over some winters I would clip a twig from which dangled a notably larger cocoon (A female's is about a third larger than a male's.), then take it home to store with the cocoons of other giant silk moths. Almost all of these were attained as the result of raising many caterpillars of each species in the nature center through the summer. I keep the 'cocoon cage' outside, along the north wall of the garage over the winter.

With the arrival of June on many days the moths of various species eclose from the cocoons. Males are routinely released at dusk, but a female may be placed in the cage described above to attract a mate overnight. The following night she will begin to lay fertile eggs in the cage. When she lays as many as I'd like I set her loose into the night to continue egg dispersal. When the eggs hatch, we raise the larvae to use for educational programs. We also distribute them with care instructions to people interested in the experience of raising them over the summer.

When a female Promethea emerges I don't even necessarily have to put her in a cage to attract a male. She is definitely not going anywhere. However, the Blue Jays in our yard are very keen to the emergence of the moths and will fly in to snatch an exposed one, sometimes displaying incredible boldness as we stand only several feet away. With a female Promethea out, we have to be constantly vigilant of the surrounding jay activity while watching for an incoming male.

A female Promethea clings to her cocoon.

The male Promethea in flight is not only similar in overall coloration and size to a large, dark-colored butterfly like the Black Swallowtail, Spicebush Swallowtail or Mourning Cloak, but the cadence of its wingbeats and mien of its flight path are also very butterfly-like. Thus, if most folks witnessed the pass of a male Promethea through the yard on a sunny June afternoon they would definitely assume it to be a butterfly.

When a female distends her ovipositor the scent is wafted directionally by the prevailing air current. Any of a number of males, up to a mile or more downwind, may pick up what she's laying down then fly in her direction. The closest males are most likely to reach her first. The lucky winner quickly finds her and couples its abdomen to hers. The source of the pheromone is abruptly severed. The residual chemicals in the air dissipate in a matter of minutes and the ensuing males lose the scent. Before long though, they will veer onto new courses as dictated by the pheromones from other females in the environment.

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One June in the late-nineties, when our three sons ranged in age from about eight to five years old I put a female Promethea into the cage on the patio picnic table. At about five o'clock I noted her distended ovipositor and turned my attention downwind. Minutes later, I spotted a male approaching across the lawn.

I quickly gathered the boys in front of the table, explained that the moth fluttering toward them wanted to come to the moth in the cage, and directed them to not let him reach it. When he got close they were to gently shoo him away with their hands.

The male was relentless in pursuit of his whole reason for being, now so close at hand. When he got shooed back he made a fluttering arc behind the boys and zoomed in for a second attempt, then a third. The boys laughed as they spun in circles trying to keep track of the moth as it bounced through the air around them. Then a second moth arrived.

I knew there was no way they would keep two moths at bay for long, so I joined them. The moths bounced lightly against our hands, arms, bodies and faces but we made sure to only push them back, not to swing at them, so as not to injure them. Seconds later, a third then a fourth moth flew in.

Thoroughly amused, Carol stood well away from us to shield our one-year-old daughter from this roiling vortex of men and moths. Alas, the multi-moth offensive was too much for us to hold back. One breached our defense and made it to the cage. Abdomens coupled almost instantaneously, and the pheromone ceased flowing.

Over the next minute, displaying a steady lack of direction to their focus, we watched the remaining males circle around the patio. In another minute the last of them flew out of sight. The entire encounter had started then ended in no more than five minutes.

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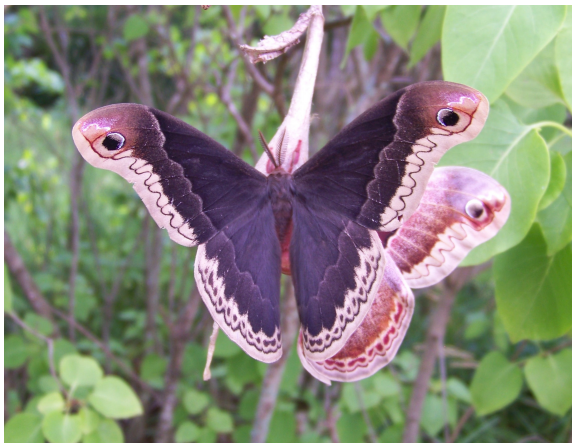

A male Promethea's wings contrast sharply with those of the female behind it.

About ten years ago, we hosted an outdoor nature-themed birthday at our center in mid-June. The party was set to take place between two and four o'clock. A mix of relatives and friends, children and adults, engaged in activities centered largely on the turtles in pools on the patio and the handling and feeding of some of our many snakes.

A female Promethea had incidentally emerged from a cocoon earlier in the day. Before the party started I had placed her in the mating cage in the shade next to the patio, then pointed her out to the guests while showing them around. I explained the timing of her pheromone release and of the possibility that near the party's conclusion they might get to see a male moth arrive to mate with her.

Four o'clock arrived, but she had not yet started to release the pheromone. The invitees eventually departed while the parents and their two daughters remained to clean up afterward. As they were loading supplies and presents into their vehicle, I spotted a male Promethea flying across the lawn in the direction of the cage.

I quickly instructed the siblings about how they were to keep the moth away from the female inside. If they could hold it back for a few minutes, more might show up. The dad pulled out his cell phone and recorded the sudden burst of activity. Soon three separate males had appeared, each desperate to reach the cage. The girls shrieked with excitement as moths danced and floated in circles around them. No sooner had one moth been waved back from the cage when another tried to slip in right behind it.

Suddenly, one moth became entangled in the birthday girl's long, dark hair. While the mother tried to carefully extricate it the second daughter was pressed into double-duty to keep the other moths away. Soon, a moth became entangled in her hair, as well. Both girls distracted now, the third moth was able to fly up to the caged female undeterred. The freshly-extricated moths were likewise soon out of sight, and calmness returned.

I explained the Promethea Moth's life cycle, of how that night this female would begin laying fertile eggs in the cage, and also of how – if they would like – they could come back to acquire a few eggs from us, watch them hatch, then raise the caterpillars at home through the summer.

When they finally departed the father spoke for all of them: *The most exciting part of the party happened after all the guests had left.*

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In a few other timely circumstances we've been able to share the Promethea pheromone phenomenon with others.

Locals remember Lansing's now-terminated annual Common Ground Music Festival. One summer we were contracted to set up a small exhibit of our reptiles and amphibians at the event which was held along Riverfront Park. I brought a newly-emerged female Promethea in a cage for passers-by to view.

A mixed group of adults and kids were visiting the exhibit after four o'clock, shortly before we were scheduled to pack up and leave. I turned to notice the moth's ovipositor distended, then directed the visitors' attentions to it. I voiced my lack of confidence, though, as to whether there were enough wild Promethea Moths in the heart of the city for her to have success attracting a mate. As if on cue, a male moth suddenly materialized over my shoulder, fluttered up to the cage and deftly sidled up to the female.

The event featured a wide range of entertainers, including magicians. Therefore, I was not completely surprised when one man - incredulous over what he just witnessed - asked, 'How did you *do* that?"

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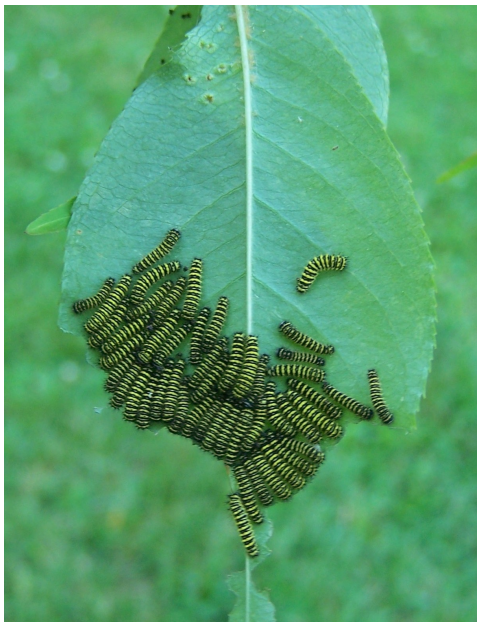
The above accounts occurred in the past and are, therefore, related in the past tense. Sadly, from our experience over just the last several years, the Promethea itself appears to quite abruptly have become a moth of the past.

For over two decades we've propagated Promethea Moth caterpillars - impressively large and ornate - over the summers at Nature Discovery. We've used live specimens in presentations and exhibits locally and across the state. We've provided newly-hatched larvae with care instructions to adults and families so that they, too, could become privy to the intimate details of this moth's life and ecology.

Over the past few years we've had none. Little did I know at the time, but 2021 and 2022 were to become our last summers attempting to propagate Prometheas. In 2021 I clipped sprigs from the same trees around our property and immediate neighborhood as I had every other year to feed to larvae that had hatched from fertile eggs. I was flummoxed as to why they failed to thrive. The last of them wasted away a few weeks later. It happened again the following summer.



First instar Promethea larvae from our educational collection share a cherry leaf. Young larvae are quite gregarious.

In these same years over the winter, I walked the previously-mentioned 'country block' around our neighborhood and found not a single Promethea cocoon. Needless to say, we've had no cocoons on hand here since; nor have I seen a single male Promethea fly through our yard on a June late-afternoon.

What is causing the crash? Take a guess and you'll likely be right… Habitat loss? Check. Climate change? Check. Pesticides? Check. One specific article (link provided at the end of this newsletter) ranks increased pesticide application and potency as the greatest of threats and mentions America's Midwest to be experiencing significant butterfly losses. From our personal experience north of Williamston, we concur…

In recent publications pertaining to butterfly declines, entomologists note that moths are most assuredly undergoing similar slides in diversity and abundance. However, their nocturnal tendencies make them more difficult to study and quantify.

To those rightly concerned about butterfly declines, I'd like to add this: You should be even more alarmed over the extrapolated declines in *moth* diversity and abundance. Worldwide, the insect order Lepidoptera contains nearly 200,000 species of butterflies and moths, yet, moth species outnumber butterfly species *ten-to-one*.

Evidence of recent songbird declines are also correlated to lepidopteran declines. A significant number of these species rely on the availability of abundant protein in the form of caterpillars to fuel their migration and to feed their nestlings.

A late-fifth-instar Promethea caterpillar is an ornate work of natural art.

In years just prior to, and coinciding with Promethea and other lepidopteran declines that we've noticed here, pesticide applications have definitely increased: i.e.,

Detroit Edison has opted to shower roadside vegetation for miles with herbicides in lieu of sending human crews to cut limbs that grow too close to the lines; the lush green life of a Michigan rural roadside in summer consciously reduced to poisoned, shriveled, lifeless brown skeletons.

A local farmer decided to douse nearly a half mile of roadside vegetation with his own herbicide concoction, we presume, so as to eke out a sliver of space for another row or two of crops.

The neighbor to our west chemically treats a few acres of lawn each summer. The prevailing wind blows it onto our property, and the odor in the yard is palpable.

More widely, based on the prevalence of lawn signs in front of properties, prophylactic spraying for mosquitoes and ticks is on the rise. These companies conveniently omit the fact that the broad-spectrum insecticides they are applying will kill a butterfly caterpillar as assuredly as it will a mosquito. However, were they to comply with our wish for full disclosure-in-advertising, a switch to the name 'Butterfly Squad' would assuredly kill *profits*, instead.

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So what can we do about it? Easy. 1. Don't apply chemical pesticides on your property. 2. Let public utilities, plus county and township officials know that you disapprove of such roadside chemical applications. 3. Educate neighbors about the damaging effects of insecticides on butterfly and bird populations. 4. Become familiar, first hand, with giant silk moths as well as with other lepidopterans and their ecologies, perhaps by raising caterpillars over the summer. We'd love to get you started.

Luna Moths are emerging from cocoons now! If you have access to the leaves of hickory or walnut trees you can raise caterpillars this summer then release them when they emerge as moths. Our first Cecropias should be emerging from cocoons any day, as well. Simply contact us to make the arrangements.

- Jim McGrath

Thank you, Cedar Creek Vets!

We're grateful that Cedar Creek Veterinary Clinic supports Nature Discovery's educational mission, so much as to offer pro bono access to heath care for some 80 animals in our educational menagerie!

Did you know that Cedar Creek Vet is known throughout the state and beyond for their specialty in reptile and bird care?

Visit https://cedarcreekvet.com/ for more information.

Photo: Olivia cradles our 'outpatient' Black Ratsnake.

Nature Discovery

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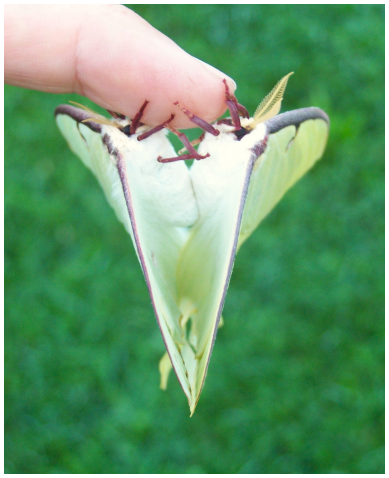
Visit Our Nature Center by Appointment

Suggested Minimum Donation: $5/person/hr

The sky's the limit for natural science learning here – with a Michigan twist! Adults, couples and individual families are welcome to schedule an intimate indoor or outdoor visit to what we call "The Biggest Little Nature Center in Michigan," and "Home to the Largest Zoo of Michigan-native Reptiles and Amphibians." The unique, in-person, hands-on experiences here are unrivaled at any other nature center or zoo! We will bring snakes, turtles, frogs and salamanders out of tanks to interact with adults or students of any age or grade-level.

Identify and feed "the grand slam of Michigan turtles" - all ten species native to our state as they swim and bask in pools on the patio! Meet, pet and feed "Milberta", our hungry Red-footed tortoise.



Mating Luna Moths.

Handle any or all of Michigan's three species of garter snakes while learning how to tell them apart, then watch them gobble up worms and frogs. Hold or "wear" a gentle 6-foot Black Ratsnake – the largest in the state!

Many more snakes, turtles, frogs and salamanders to identify and feed. Identify birds at the feeders. Take a guided walk on our trails to identify breeding birds by their songs.

See huge Luna and Cecropia Moths freshly-emerged from cocoons, then let ne perch on your hand for a photo op. Contact us for additional information or to schedule a day and time.

Ask about special guided birding outings and nature walks at a natural area of your or our choosing!

Around the State in June

- ***Saturday, June 7**: 10am-2pm. MI Reptiles & Amphibians Exhibit, 'Birds of the Jack Pines' Presentation; Kirtland's Warbler Wildlife Festival, Roscommon.*
- ***Saturday, June 7**: 10am-2pm. MI Reptiles & Amphibians Exhibit; Sturgeon Festival, Port Huron.*
- ***Tuesday, June 11**: 6-7pm. Colors of Nature Presentation/Guided Walk: Island Park Gazebo, Grand Ledge.*
- ***Saturday, June 14**: 10:30am. MI Reptiles & Amphibians Presentation; Huron County Nature Center, Hume Township.*
- ***Saturday, June 14**: 10am-2pm. MI Reptiles & Amphibians Exhibit; Webber Township Get Outdoors Day, Baldwin.*
- ***Tuesday, June 17**: 2-3:30pm. MI Wildlife Presentation; River Rapids Library, Chesaning.*
- ***Sunday, June 22**: 10am-2pm. MI Salamanders/Giant Silk Moths Exhibit, Williamston Farm & Artisan Market, Williamston.*

Raise Giant Silk Moth Caterpillars this Summer!

Fertile eggs or newly-hatched larvae of huge and beautiful Luna and Cecropia Moths are available throughout the month while supplies last.


Luna


Cecropia

Four larvae of one species with detailed care instructions, only $15.
Contact us to make an appointment to pick them up at the nature center almost any day.

More Reading for Concerned Americans

Insecticides, More Than Herbicides, Land Use, and Climate Are Associated with Declines in Butterfly Species Richness and Abundance in American Midwest
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0304319

Major US Climate Website Likely to be Shut Down After Almost All Staff Fired
https://www.theguardian.com/us-news/2025/jun/11/climate-website-shut-down-noaa?campaign_id=54&emc=edit_clim_20250612&instance_id=156414&nl=climate-forward&regi_id=97652655&segment_id=199816&user_id=e2b8dd8c9b543fb8c35d5dd30658067e

Peanuts or Almonds? Rice or Millet? Planet-Friendly Grocery Shopping Choices Go Beyond Cutting Meat
https://apnews.com/article/climate-grocery-impact-carbon-emissions-choices-food-c37b1ab626b12dc392e7bffdde280245?campaign_id=54&emc=edit_clim_20250612&instance_id=156414&nl=climate-forward&regi_id=97652655&segment_id=199816&user_id=e2b8dd8c9b543fb8c35d5dd30658067e

Three Well-Tested Ways to Undermine an Autocrat
https://www.nytimes.com/2025/05/21/opinion/authoritarianism-democracy-protest.html?campaign_id=9&emc=edit_nn_20250522&instance_id=155045&nl=the-morning&regi_id=97652655&segment_id=198448&user_id=e2b8dd8c9b543fb8c35d5dd30658067e

–JM

The next generation would be justified in looking back at us and asking, "What were you thinking? Couldn't you hear what the scientists were saying? Couldn't you hear what Mother Nature was screaming at you?" – Al Gore

I don't want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. I want you to act. I want you to act like you would in a crisis. I want you to act like your house is on fire, because it is. – Greta Thunberg

The personal actions that cut climate pollution fast are to go flight-, car-, and meat-free. Start with the one that feels most feasible for you; if you can't totally go without, aim to cut your consumption today at least in half. – Kimberly Nicholas, Under the Sky We Make

What if we had storytelling mechanisms that said it is important that you know about the well-being of wildlife in your neighborhood? – Robin Wall Kimmerer

Study nature, love nature, stay close to nature. It will never fail you. – Frank Lloyd Wright

SWIM
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Statewideindivisiblemi.com

Union of Concerned Scientists
Science for a healthy planet and safer world

IND 7
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UNITED WE RESIST

PLEDGE TO FLY LESS & SAVE MORE
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ICN
insideclimatenews.org

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