EPA's Office of Environmental Justice and External Civil Rights'

EJ Webinar Series for Tribes and Indigenous Peoples:

Source: Wikimedia Commons

Indigenous Food Sovereignty: A Panel Discussion on Advancing EJ and Reclaiming Traditional Food Pathways

September 25, 2024

Webinar Agenda

1. Welcome & Introduction
2. Mindful Moment with Chelsea Draper, Mindful EPA
3. OEJECR Updates with Andy Bessler, EPA OEJECR
4. Panel Presentations:

   Luke Jones, U.S. EPA AIEO

   Marc Anderson, P.E. (Seminole), Consulting Engineer

   Emily Luscombe, Intertribal Agriculture Council
5. Panel Discussion with Q & A
6. Adjourn

Mindful Moment

With Christy Draper, Mindful EPA

Christy Draper is a Quality Assurance Manager for the EPA Gulf Ecology Measurement and Modeling Division located in Gulf Breeze, Florida. She is also a meditation facilitator for Mindful EPA.

EPA's Climate Web Resources

- **NEW!!** **EPA's Climate Resilience and Adaptation Funding Toolbox (CRAFT)**
- **TODAY**, **EPA Launched the National EJ Climate Corps in Partnership with AmeriCorps**
- **EPA National Climate Resources for Tribes**
- **EPA's Revamped AirNow Map**

EPA's EJ Web Resources

- **Environmental Justice Clearinghouse**
- **EJSCREEN**
- **EPA's Equity Action Plan**
- **EPA External Civil Rights**
- **Environmental Justice Scorecard**
- **Resources to Help Communities webpage**

IRA FUNDED GRANTMAKERS

CHECK OUT THE GRANTMAKERS FAQ PAGE THAT IS UPDATED REGULARLY !

Environmental Justice Thriving Communities Grantmaking Program (EJ TCGM)

Regional & National Grantmakers

GRANTS FOR TRIBES AND INDIGENOUS PEOPLES

EPA's EJ TGM Funding Breakdown

Approximately $600 M awarded to 11 Grantmakers

- 9 Regional and 3 National Grantmakers to provide 1000s of subgrants nationwide
- 80% of each $50 million Regional Grantmaker award will be redistributed in Thriving Community Subgrants [$40million]
- Tier 1-3 Competitive subgrants available for **Assessment**, **Planning**, and **Project Development** activities ranging from $150,000 to $350,000
- Non-competitive awards up to $75,000 provided to severely capacity-constrained CBO

Project Timeline

- **11 cooperative Agreements** with substantial EPA involvement & oversight
- Grantmakers awarded in **Spring 2024**. Subgrant applications open in **Summer 2024**
- **Project Period is 3 years**. Funds available until 2027 depending on award date

11 GRANTMAKERS

9 REGIONAL

3 NATIONAL

Proposed Geographic Area	Legal Business Name	Submitter State	
Region 1	Health Resources in Action	MA	Region 1
Region 2	Fordham University	NY	Region 2
Region 3	Green & Healthy Homes Initiative Inc.	MD	Region 3
Region 4	**Research Triangle Institute	NC	Headquarters
Region 5	The Minneapolis Foundation	MN	Region 5
Region 6	*Texas Southern University	TX	Region 6
Region 7	Reference Central National GM		NA
Region 8	JSI Research and Training Institute, Inc.	CO	Region 8
Region 9	Social and Environmental Entrepreneurs (SEE), Inc.	CA	Region 9
Region 10	**Philanthropy Northwest**	**WA**	**Region 10**
National GM East [Regions 1-3]	*Institute for Sustainable Communities	VT	Headquarters
National GM West [Region 8-10]	**Climate Justice Alliance**	**CA**	**Headquarters**
National GM Central [Region 4-7]	**Research Triangle Institute	NC	Headquarters

*RTI will serve as both the Region 4 Grantmaker as well as one of three National Grantmakers
*TCTAC or TCTAC partner

Grantmakers can make subawards to eligible entities including:

- NGO/CBO and other grassroots nonprofit organizations
- Tribal governments (both federally- and state-recognized) and intertribal consortia (i.e., a partnership between 2+ Tribes that seek to achieve a common goal)
- Native American Organizations (incl. Native Hawaiian orgs., cooperatives, nonprofit corporations, partnerships, and associations with the authority to sign legally binding agreements)
- Puerto Rico, Hawaiian Native Organizations and US Territories
- Freely Associated States (FAS) – incl. local governmental entities and local nonprofit organizations in the Federated States of Micronesia, the Republic of the Marshall Islands, and Palau.

Historic Funding for Tribes

- **Environmental and Climate Justice Community Change Grants Program (EJ CCG)**
  - ⚠️ **Application period closes on 11/21/24** ⚠️
  - **First EJ CCG Award announced for MTERA/GRID Alternatives to receive nearly $20 million**
  - **More CCG awards announced soon!**

- **Tribal & Territory Grants: Diesel Emissions Reduction Act**

- **$25.5 M in Drinking Water Infrastructure Funds**

- **$117 M in Solid Waste Infrastructure for Recycling Grants for Tribes and Intertribal Consortia to address food waste prevention and composting**

Historic Funding for Tribes

Greenhouse Gas Reduction Fund:

- $27 b. for clean energy project funding and grants for low-income communities
- Solar for All provided $7 b. to 60 awardees, including 6 Tribal awardees
- National Clean Investment Fund awarded $14 b. to 3 entities to create clean financing institutions
- $6 b. for a Clean Communities Investment Accelerator for 5 awardees, including the Native CDFI Network ($400 million award), a nonprofit that serves 60+ U.S. Treasury-certified Native CDFIs.
- Native CDFIs have a presence in 27 states across rural reservation and urban communities. They strive to combat capital access barriers in Native communities.

Historic Funding for Tribes

- **Climate Pollution Reduction Grants Announced!**
  - **EPA announced last week the funding of $300 million for 34 projects proposed by Tribes including:**
    - **ANTHC**
    - **Aleut Community of St. Paul Island**
    - **Central Council of the Tlingit and Haida Indian Tribes of Alaska**
    - **Native Village of Eyak**
    - **Village of Solomon**
    - **Specific information on all awards is here!**

The Environmental Justice Thriving Communities Technical Assistance Centers Program and Thriving Communities Network

EJ TCTAC

Environmental Justice
Thriving Communities Technical
Assistance Centers Program

U.S. Environmental Protection Agency
in partnership with the Department of Energy

www.ejtctac.org

www.ejtctac.org

EJ TCTAC
Environmental Justice Thriving Communities Technical Assistance Centers Program
U.S. Environmental Protection Agency in partnership with the Department of Energy

- **Find your TCTAC at this QR Code and website!**
- **Available over the next 5 years from 3 national and 13 regional TCTAC's.**
- **EPA's EJ TCTAC Program is part of the Federal Thriving Communities Network Initiative that is working towards a holistic government-wide framework for providing technical assistance.**
- **Learn more from last week's webinar with OEJECR, TCTAC's and the U.S. Dept. of Interior by clicking here for the recording and click here for the slide deck.**

How do TCTACs work?

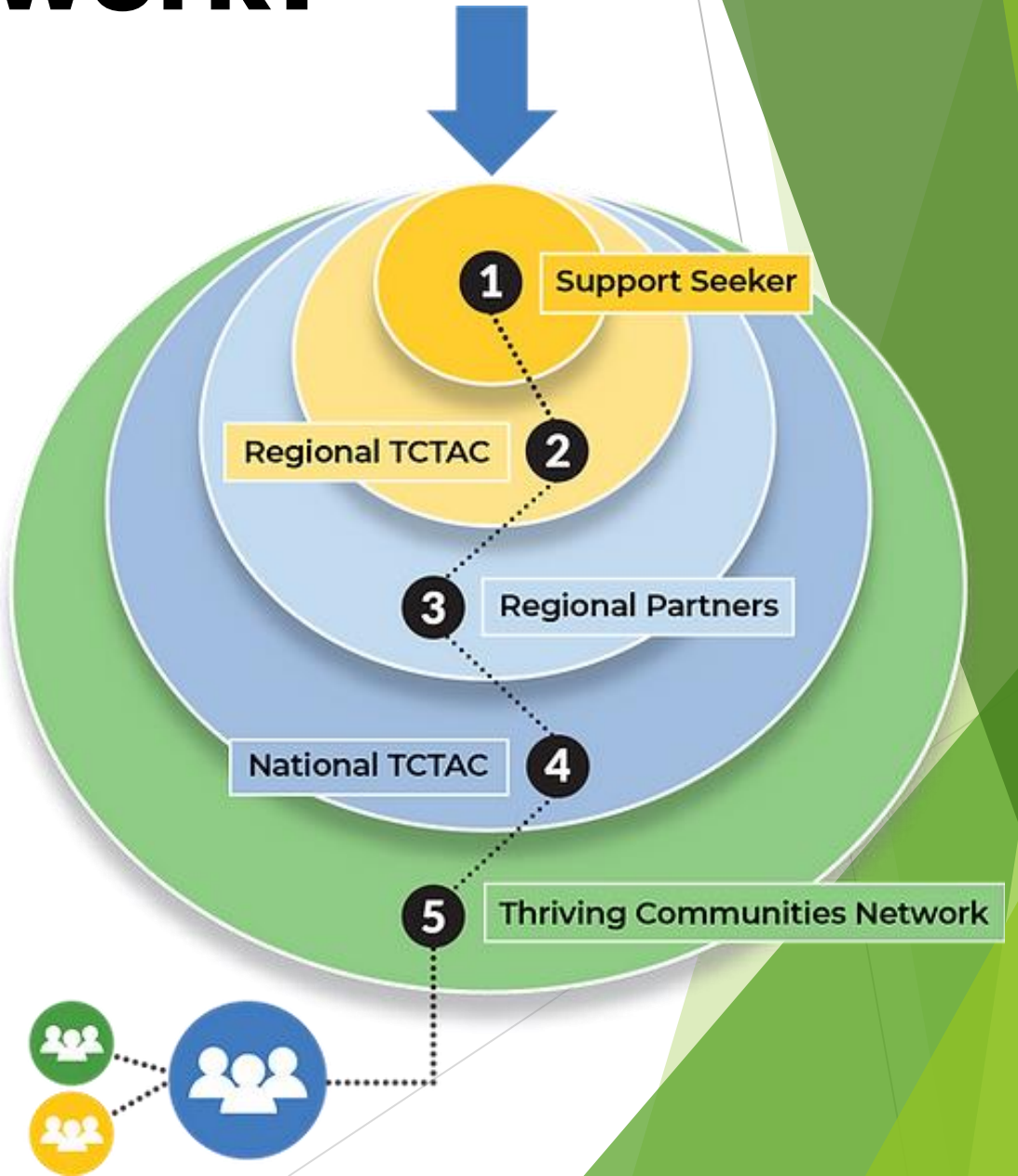
Support seeker from an eligible CBO, tribal government, or state/local government requesting expertise in federal grant applications, proposal writing, and grant management for environmental justice projects

Regional TCTAC prepared to provide technical assistance in collaboration with an extensive regional network of partners

Regional Partnerships with over 160 organizations nationwide ready to support regional efforts in building capacity on the ground

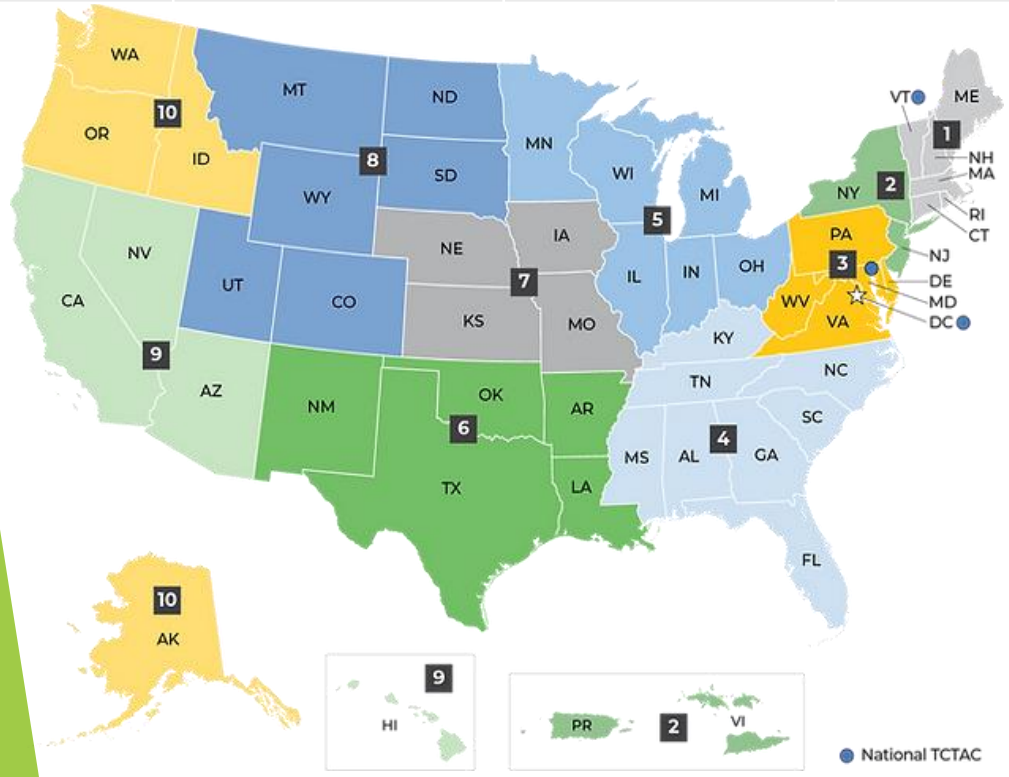
National TCTAC coordinating with regional centers and partners through resource-sharing and networking opportunities

Thriving Communities Network expanding our program's access to a range of technical assistance providers



Regional & National TCTAC Map and Contacts
www.ejtctac.org

Region	Name	Email or Phone	Request TA
National Tribal Lead TCTAC	**NIHB: National Indian Health Board**	**202-996-4717 environmentalhealth @nihb.org**	**Form**
National	ISC: Institute for Sustainable Communities	ejtctac@sustain.org	Email
National	ICMA: International City/County Management Association	800-745-8780 tctac@icma.org	Form



Region	Name	Email or Phone	Request TA
1	Institute for Sustainable Communities	rsanderson@sustain.org	Email
2	WE ACT for Environmental Justice	sarah.salem@weact.org	Form
2	Engage & Assist Grassroots organization for Environment/Energy Justice and Leadership capacity building (EAGLE) at the Inter-American University of Puerto Rico-Metropolitan Campus	ygovender@metro.inter.edu (787) 250-1912	Form
3	National Wildlife Federation's Mid-Atlantic Thriving Communities Technical Assistance Center	(202) 792-5350	Form
4	REACT4EJ at RTI International	jarmstrongbrown@rti.org 1-866-309-4559	Form
4, 6	Deep South Center for Environmental Justice (DSCEJ) Community Investment Recovery Center (CIRC)	circ@dscej.org	Form
5	Blacks in Green (BIG)	BIGEJTCTAC@blacksingreen.org 833-828-2269	Form
5	Great Lakes Environmental Justice Thriving Communities Technical Assistance Center (Great Lakes EJ TCTAC) at the University of Minnesota	tctac@umn.edu 800-525-8636	Email
6	South Central TCTAC at New Mexico State University (NMSU)	patsulli@nmsu.edu (575) 646-2913	Email
7	Heartland Environmental Justice Center	heartlandej@wichita.edu (316) 945-6615	Form
8	Mountains and Plains Thriving Communities Collaborative at Montana State University	R8TCTAC@montana.edu (406) 994-6904	Form
9	The Center for Community Energy and Environmental Justice (CCEEJ) at San Diego State University (SDSU)	cceej@sdsu.edu (619) 594-8287	Form
9	Western Environmental Science Technical Assistance Center for Environmental Justice (WEST EJ Center) at the University of Arizona	lothrop@arizona.edu (520) 314-7971	Form
10	University of Washington Center for Environmental Health Equity (CEHE)	cehe@uw.edu 206-543-0608	Form
10	Northwest Environmental Justice Center (NW EJ Center) at Willamette Partnership	connect@nwejc.org	Form

EPA's Meaningful Engagement Policy & EJ Webinars for Tribes

- **EPA Finalizes Policy for Meaningful Engagement and Public Participation**
- **EJ Webinar Series for Tribes and Indigenous Peoples:**
  - **Monthly, on or near last Wednesday, at 2:30 PM – 4:00 PM ET.**
  - **Features OEJECR Updates, Best EJ Practices, and Tribal Presenters**
  - **Don't miss the upcoming Cumulative Impacts webinar (October 30) and Advancing EJ Through Storytelling webinar (November 20)!**
  - **What EJ topics should EPA cover in 2025? Share your thoughts!**
  - **See past recordings/register for future events on OEJECR's website!**

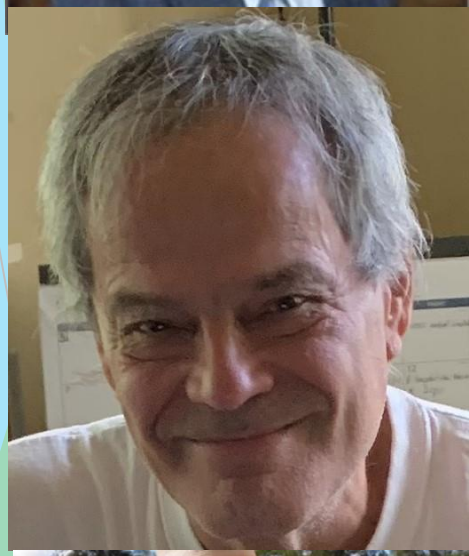
Thank you for attending!

- To sign up for more OEJECR updates send a blank email to: join-epa-ej@lists.epa.gov
- For any questions/concerns, please contact Andy Bessler, OEJECR Tribal Stakeholder Coalition Coordination, at bessler.andy@epa.gov
- To learn more about EPA's EJ work with Tribes and Indigenous Peoples, visit this page!

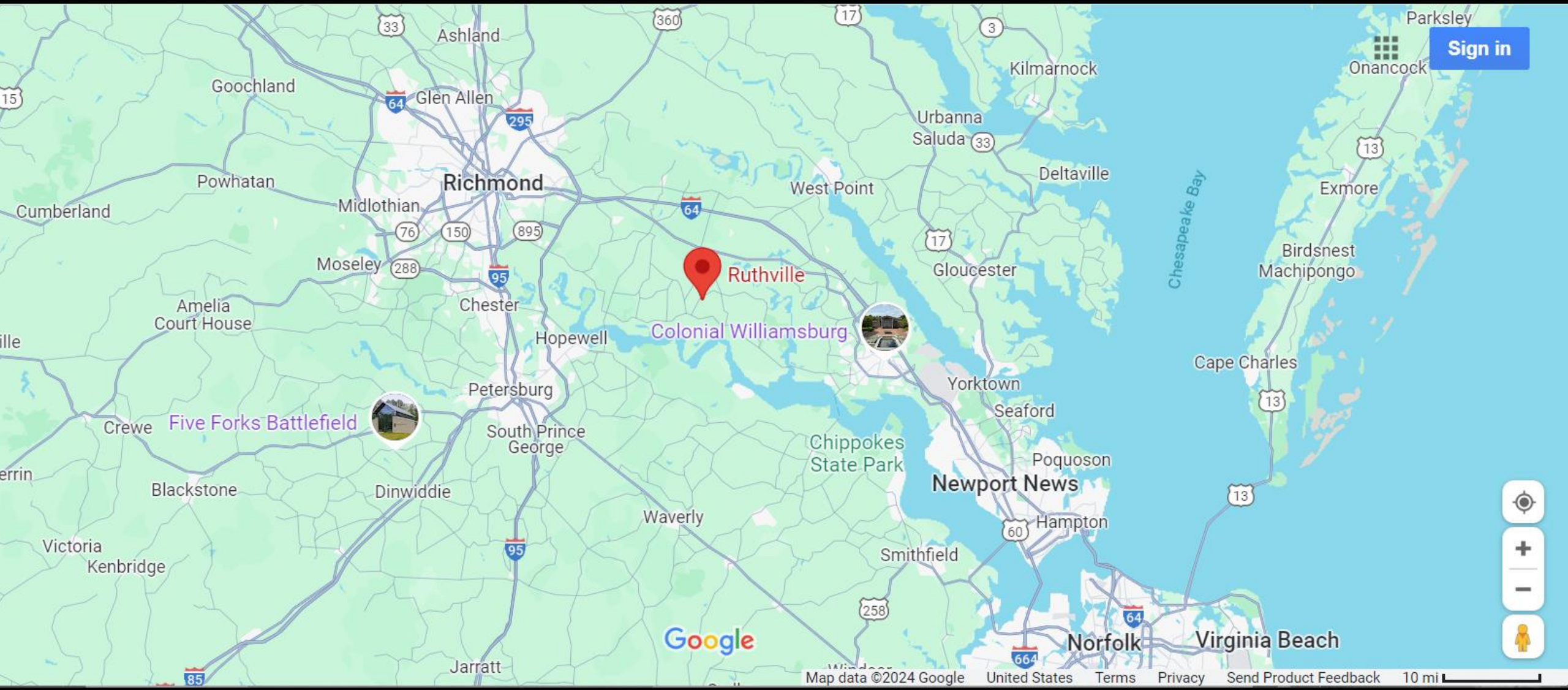
Webinar Panelists

Luke Jones is the current Chair of EPA's Feds Feed Families Campaign, is a Senior Analyst in EPA's American Indian Environmental Office (AIEO) and has helped lead EPA's Tribal program for more than 20 years. As a lineal descendant of the Chickahominy and Pamunkey Indians of Virginia, Luke has worked to improve federal Indian program administration more than 30-years and is an active member of the Native American community.

Marc Anderson, P.E. (Seminole) is an environmental engineer who has worked with Tribal governments for 27 years. His professional experience has led him to food systems as a cornerstone of environmental, public, and individual health, and of a sustainable future. Marc is active in community gardening, seed sharing, and promoting food sovereignty. He is an affiliate of the Physicians Committee for Responsible Medicine as a Licensed Food for Life Instructor and has served as Program Facilitator for PCRM's Native Food for Life Online.



Emily Luscombe is the Natural Resources Director at the Intertribal Agriculture Council where she works to assist Tribes and Tribal Producers with regenerative practices, soil building, soil health knowledge, climate change challenges, drought, water quality, pest management, habitat protections, riparian buffers, pollinator protection, and other natural resources related inquiries. Emily has worked in a variety of jobs and most recently has spent nine years managing Tribal Environmental Programs in California and Nevada and assisting other Tribes in a variety of capacities related to Natural Resources, Hazard Mitigation, and Environmental Sustainability.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Petersburg
Crewe
Five Forks Battlefield
South Prince
George
Blackstone
Dinwiddie
Waverly
Victoria
Kenbridge
Jarratt
Ruthville
Colonial Williamsburg
West Point
Urbanna
Saluda
Kilmarnock
Deltaville
Gloucester
Parksley
Onancock
Exmore
Birdsnest
Machipongo
Chesapeake Bay
Cape Charles
Yorktown
Seaford
Chippokes
State Park
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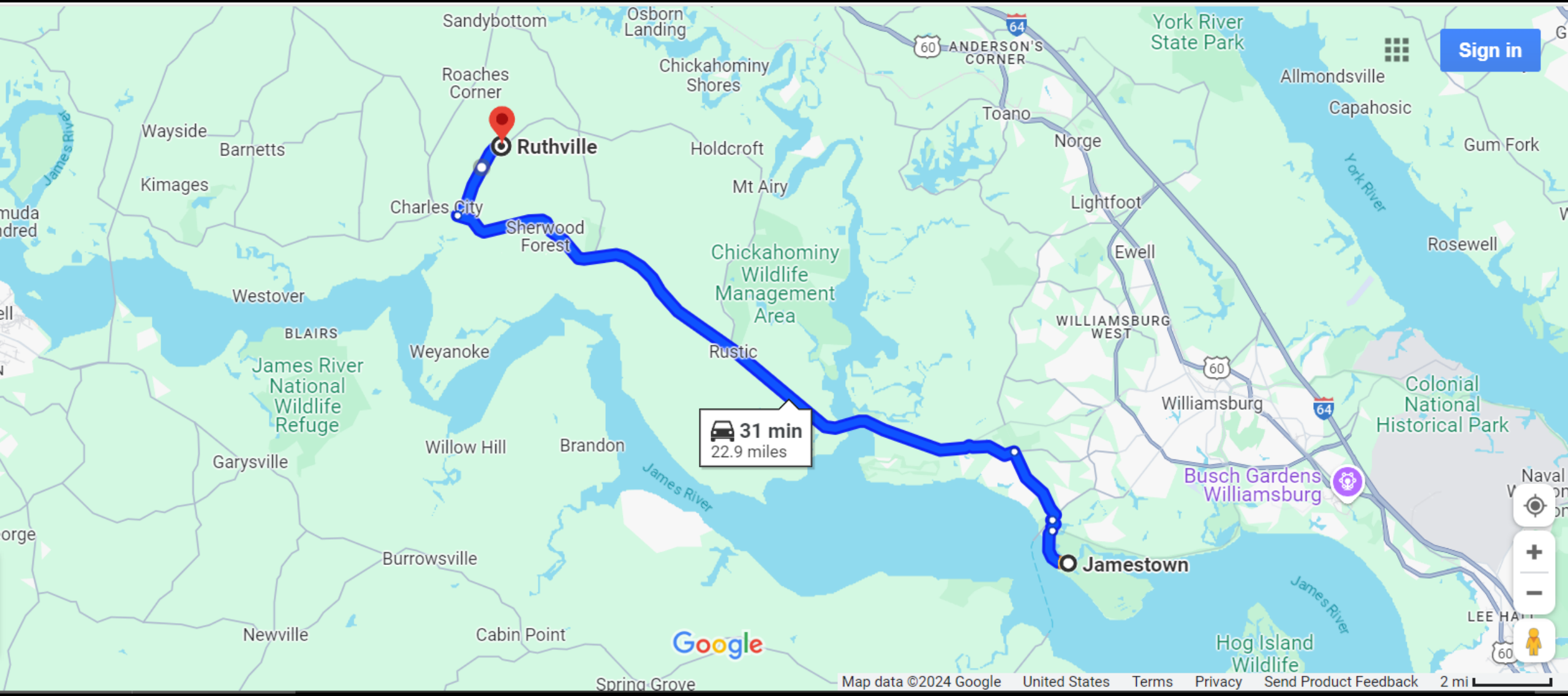
Sandybottom
Osborn Landing
Roaches Corner
Chickahominy Shores
ANDERSON'S CORNER
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Norge
Gum Fork
Wayside
Barnetts
Ruthville
Holdcroft
Kimages
Mt Airy
Lightfoot
Charles City
Sherwood Forest
Ewell
Rosewell
Chickahominy Wildlife Management Area
Westover
WILLIAMSBURG WEST
BLAIRS
Weyanoke
Rustic
James River National Wildlife Refuge
Williamsburg
Colonial National Historical Park
31 min
22.9 miles
Willow Hill
Brandon
Busch Gardens Williamsburg
Garysville
James River
Jamestown
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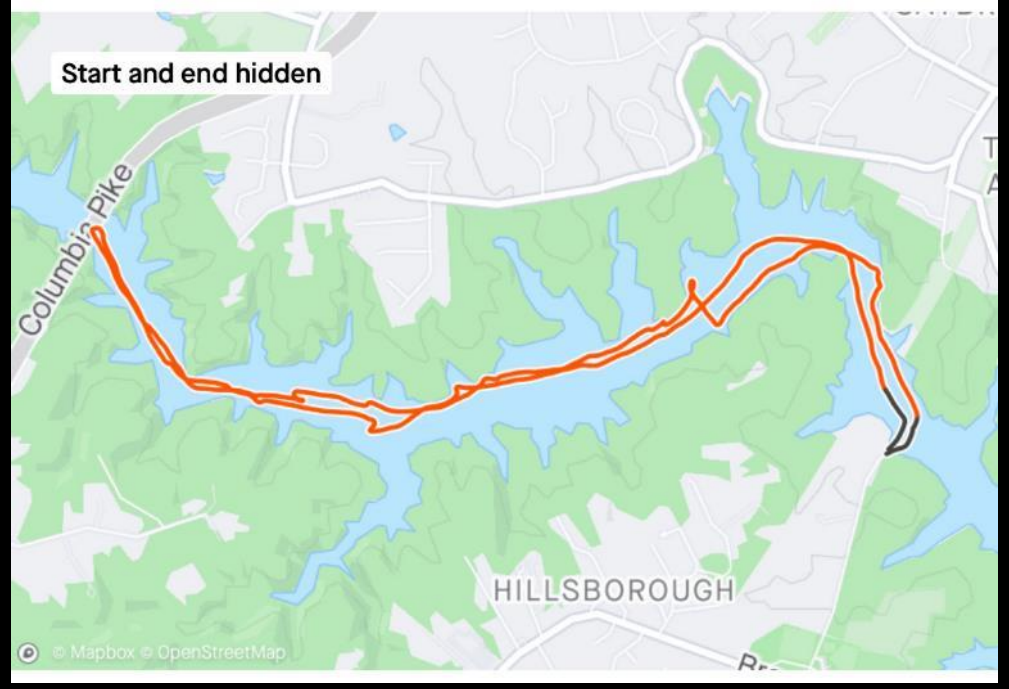
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Columbia Pike
HILLSBOROUGH
© Mapbox © OpenStreetMap

Six generations of subsistence activity, maintaining personal, family, and cultural relationships with our homelands and Indigenous food system.

What is “Food Sovereignty”?

“The ability of communities to determine the quantity and quality of the food that they consume by controlling how their food is produced and distributed.”

U.S. Department of the Interior, “Why Food Sovereignty Matters”
https://www.bia.gov/service/indigenous-tourism/why-food-sovereignty-matters

How does EPA support Food Sovereignty?

- Tribal environmental self-governance. (GAP, TAS)
- Subsistence resources. (TSCA, CWA)
- Safe agricultural practices. (FIFRA, CWA)
- Safe animal husbandry practices. (AFO/CAFO)

RESTORING INDIGENOUS FOODS & NUTRITION

Corn Mother by Julie Komenda

Marc Anderson, P.E. (Seminole)

marcbowlegs@gmail.com

ECUADOR'S 2008 CONSTITUTION

FOOD SECURITY

Access to healthy, sufficient, and nutritional food, preferably produced locally and in keeping with their various identities and cultural traditions

FOOD SOVEREIGNTY

Promoting the conservation and recovery of agricultural diversity and related ancestral wisdom, along with the use, conservation, and free exchange of seeds

NUTRITION 101

- Gut bacteria utilize fiber and polyphenols, undigestible components of food (whole grains, legumes, fruits, vegetables), to produce hormones such as GLP-1 that control appetite and metabolism.

- GLP-1 and other naturally-produced hormones regulate blood sugar through the pancreas, slow the movement of food to allow for digestion, and signal the brain that you're full.

- Fiber and polyphenols are removed in processed foods, resulting in less diversity and quantity of gut bacteria.

- Processed foods are calorie-dense, low in nutrients, high in fat, salt & sugar, and do not satiate, resulting in over-eating, obesity, type 2 diabetes, cardiovascular disease and other non-communicable diseases.

The Magic Eight:

Corn	**Beans**	**Squash**	**Tomatoes**
Chiles	**Potatoes**	**Vanilla**	**Cacao**

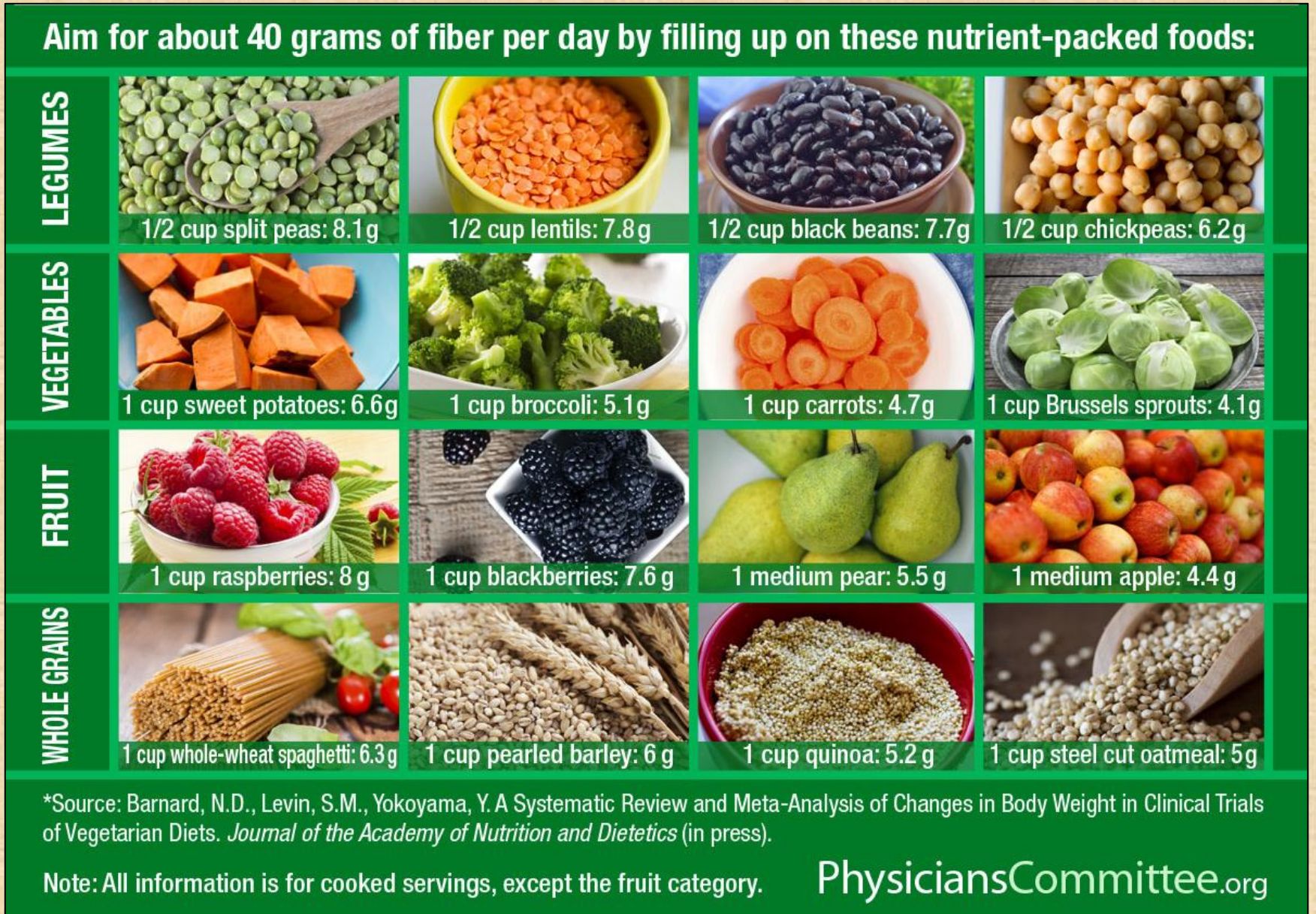
Foods that Native People gave to the world that didn't exist prior to 1492 outside of the Americas.

Courtesy of Lois Ellen Frank, Ph.D.

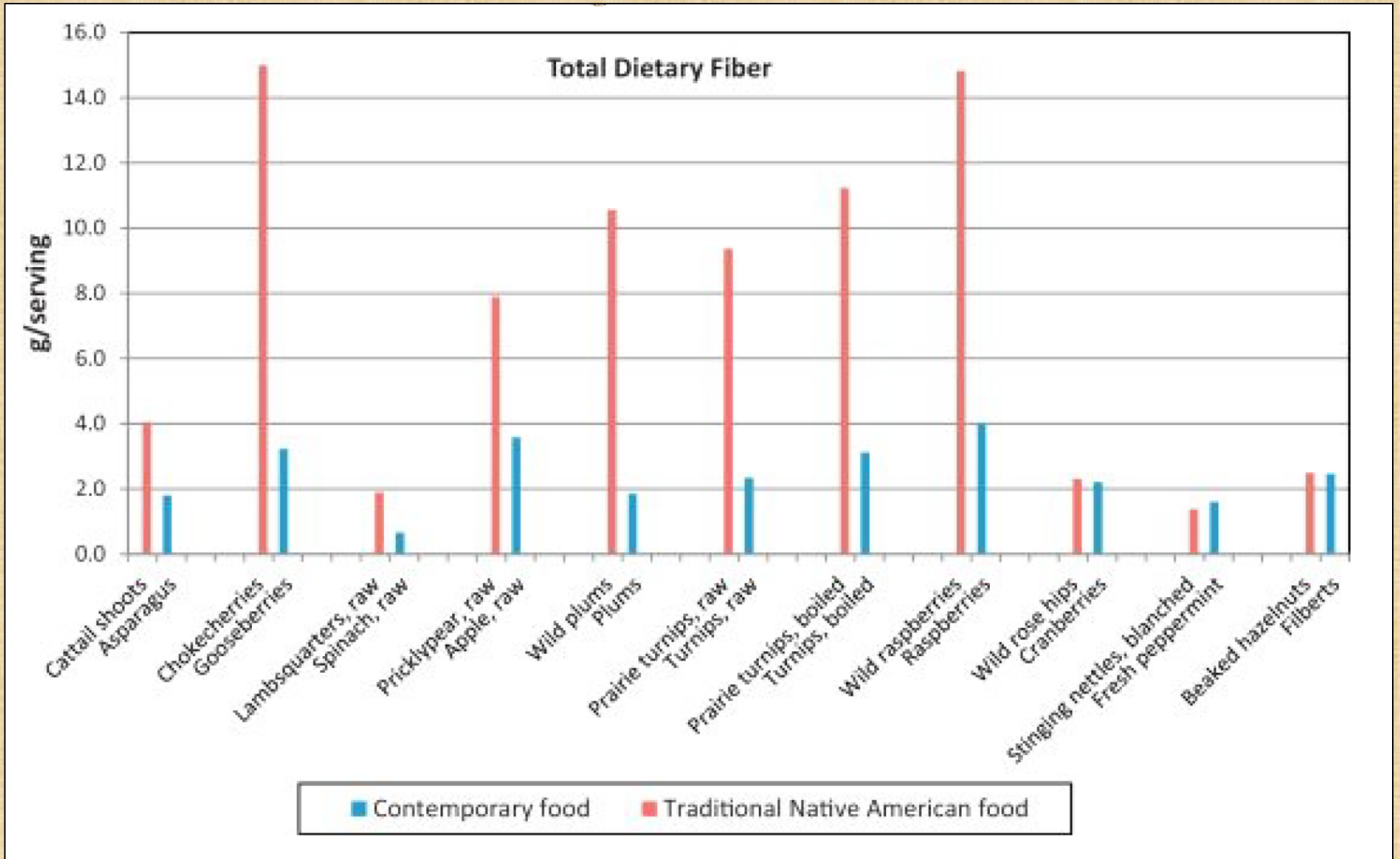
FIBER is FOOD for GUT BACTERIA

- Dietary fiber is a diverse group of compounds including lignin, a polyphenol, and complex carbohydrates which can’t be digested in the small intestine.
- Dietary fiber intake is associated with a significantly lower risk of death in men and women, and a lower risk of death from cardiovascular, infectious and respiratory diseases by 24-56% in men and 34-59% in women.
- Fibers in oat products can lower LDL cholesterol and normalize blood glucose and insulin responses.
- Consumption of diets rich in fiber is inversely associated with the risk of cardiovascular disease, type 2 diabetes, and cancer of the esophagus, stomach, colon, pancreas, ovary, and breast.

CONTEMPORARY SOURCES of FIBER



FIBER in CONTEMPORARY & TRADITIONAL FOODS



BEANS have PROTEIN & FIBER without FAT or SODIUM

4-OZ SERVING SIZE	RAW BEEF (80%)	BEYOND BURGER	IMPOSSIBLE BURGER	PINTO BEAN (DRY)	TEPARY BEAN (DRY)
CALORIES	284	260	240	313	410
PROTIEN (g)	19.2	20	19	26.9	20
FAT (g)	22.4	18	14	1.4	1
SATURATED FAT (g)	8.6	5	8	0.7	0.5
CHOLESTEROL (mg)	80	0	0	0	0
SODIUM (mg)	75	350	370	0	0
POTASSIUM (mg)	302	280	610	1,710	1,910
CALCIUM (mg)	20	100	170	180	750
IRON (mg)	2.2	4.0	4.2	6.1	26
CARBOHYDRATES (g)	0	5	9	48	77
SUGARS (g)	0	0	<1	0	6
FIBER (g)	0	2	3	5	52

GROWING TEPARY BEANS

FRUITS of the HARVEST

POLYPHENOLS are BIOACTIVE COMPOUNDS

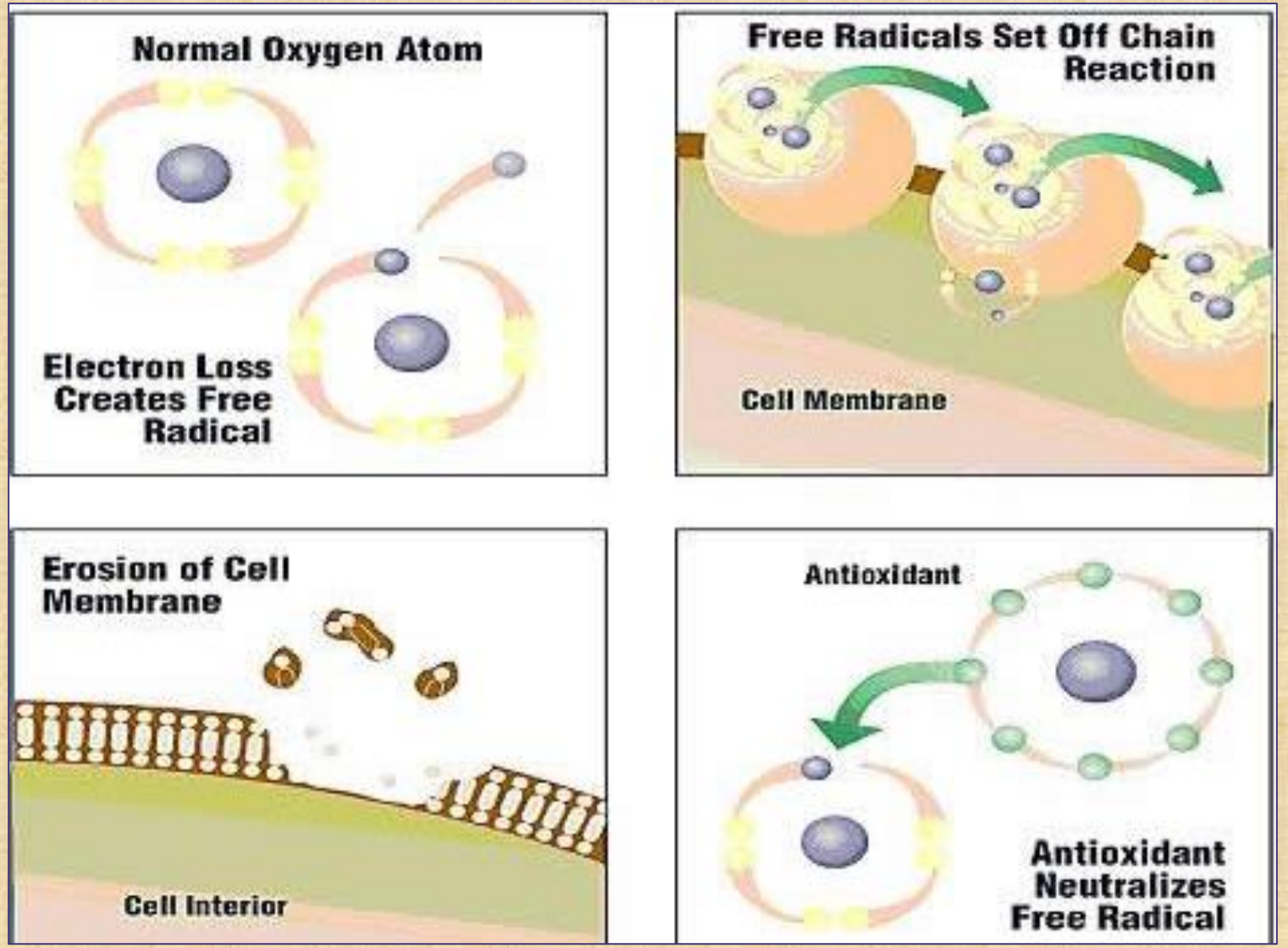
Bioactivity is related to antioxidant and anti-hyperglycemic properties. More than 8,000 polyphenols, including more than 5,000 flavonoids, have been identified in plants, including:

NAME	SOURCES
Anthocyanins	berries, grapes, red wine, red cabbage, purple corn
Flavonols	onions, scallions, kale, broccoli, apples, berries, teas
Flavones	chile peppers, celery, parsley, thyme
Isoflavones	soybeans, soy foods, legumes
Flavanones	oranges, grapefruit, lemons
Resveratrol	grapes, red wine, plums, berries
Quercetin	onions, apples, citrus fruit
Isothiocyanates	cruciferous vegetables
Curcumin	tumeric

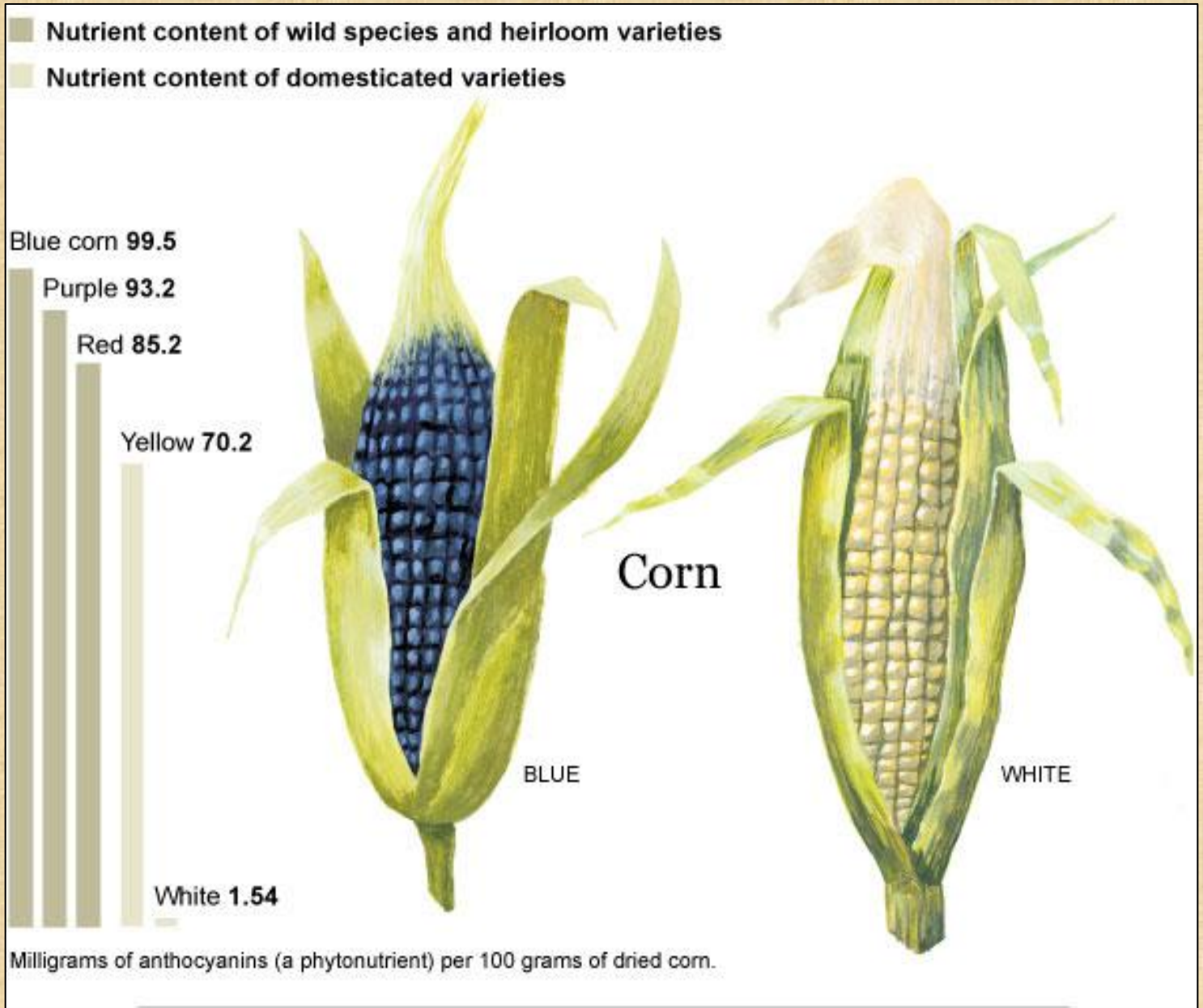
HEALTH BENEFITS of POLYPHENOLS

- Direct antioxidant activity.
- Inhibitors of LDL oxidation (mechanism for developing atherosclerosis).
- Anti-Cancer effects through several mechanisms.
- Anti-Diabetic effects through several mechanisms.
- Neuro-Protective effects against Parkinson's and Alzheimer's disease.
- Anti-Aging effects: intake of antioxidant and anti-inflammatory polyphenols found to reduce the deleterious effects of aging.

WHAT is an ANTIOXIDANT?



ANTHOCYANINS in CORN



HEIRLOOM BLUE & YELLOW CORN (NM, AZ)

CORN (*Zea mays*)

- Indigenous varieties of corn (landraces) have been minimally changed by breeding, are more resilient to environmental stress, and provide a diversity of phytonutrients.

- 98 established maize landraces originated in Mesoamerica (Mexico, Guatemala).

- 146 established maize landraces originated in the Andes (Columbia, Ecuador, Peru, Brazil, Chile, Argentina, Bolivia).

- Peruvian Andean maize consists of 5 landraces including Purple, whose polyphenol content has been documented.

POLYPHENOLS in PURPLE PERUVIAN CORN

PART OF CORN	BIOACTIVE COMPOUND	CONCENTRATION (mg/100 g)
Kernel	Anthocyanins	310-850
	Phenolic Acids	1,903
	Flavonoids	261-266
Pericarp	Flavonoids	4,200
Cob	Anthocyanins	3,280-3,970

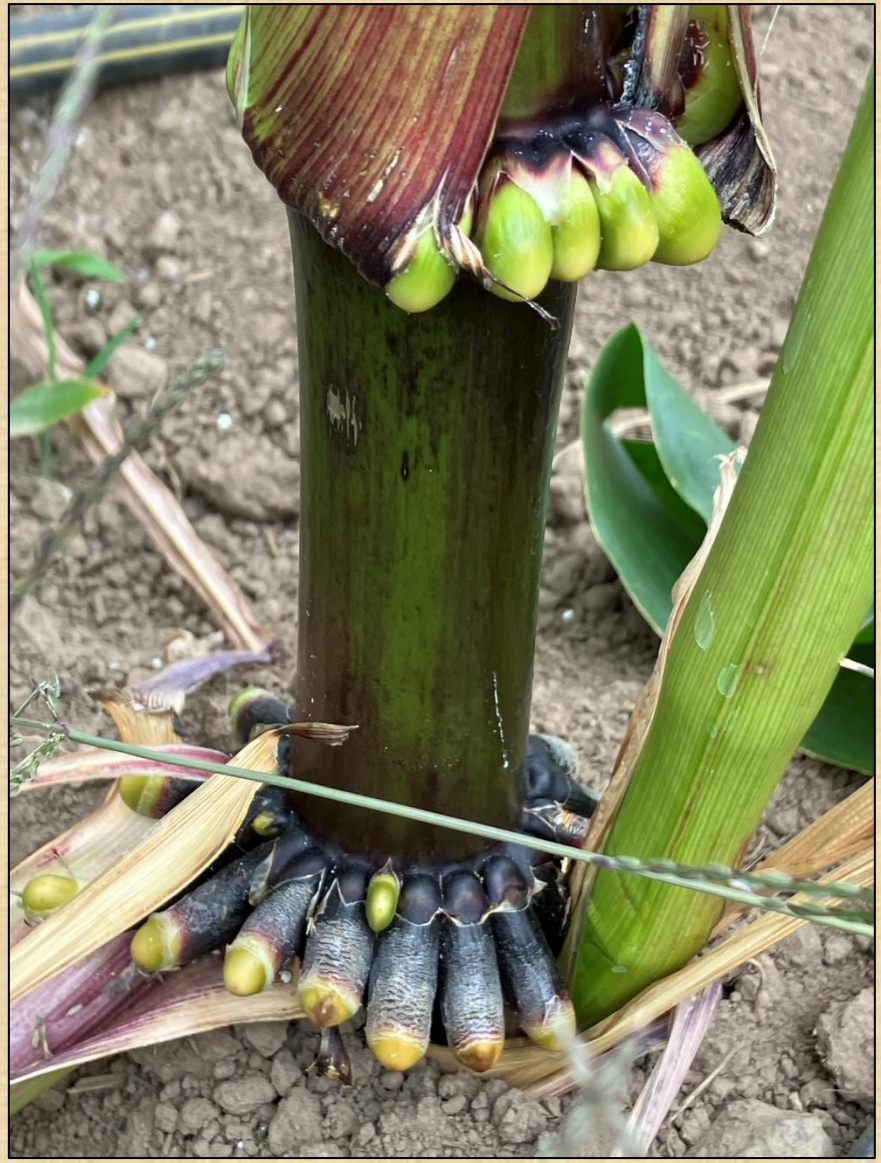
- Anthocyanins inhibit the proliferation of colorectal cancer cells, have cardioprotective activity, help with modulation of probiotic gut bacteria, and have anti-obesity agents.

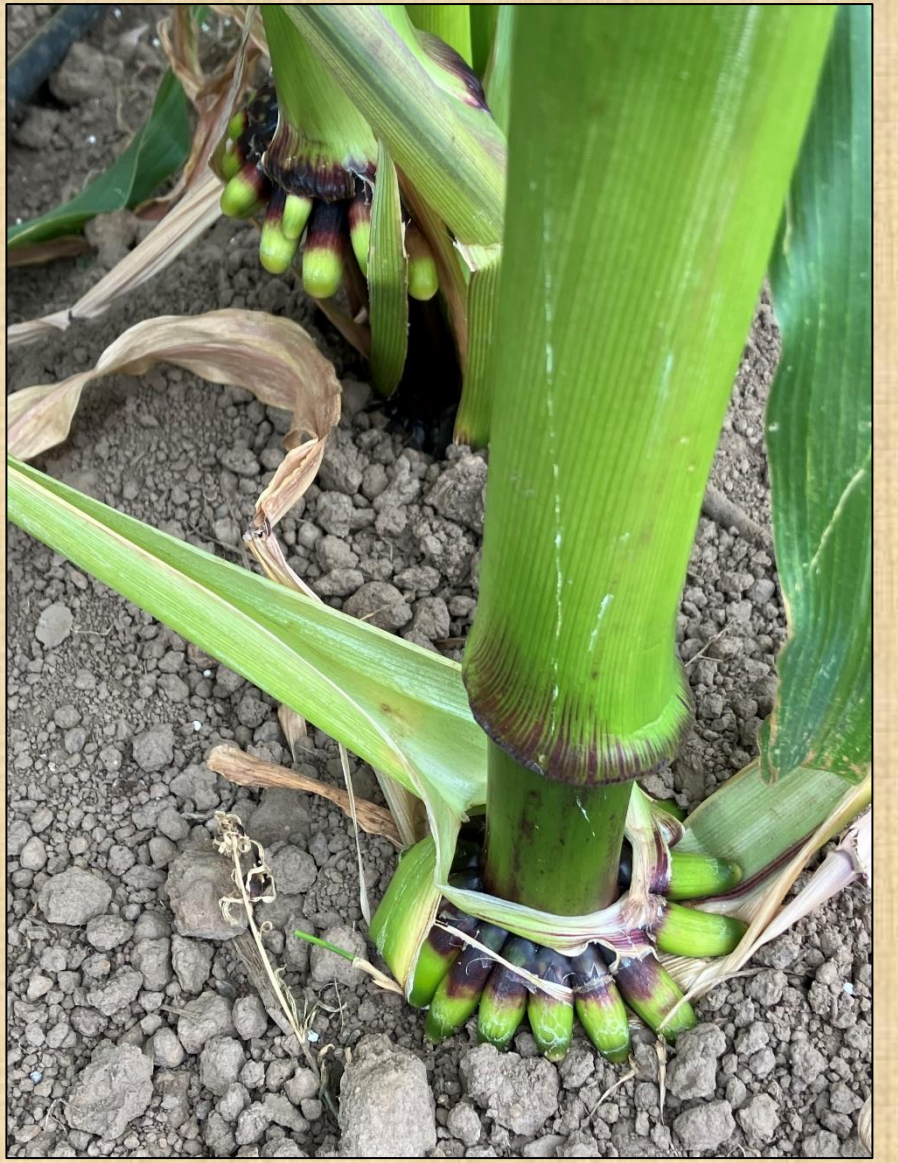
- Phenolic acids have antioxidant and anti-cancer properties, anti-hyperglycemic and anti-hypertension activity, immunostimulatory properties, and contribute to treatment of cardiovascular disease.

- Flavonoids have significant antioxidant activity.

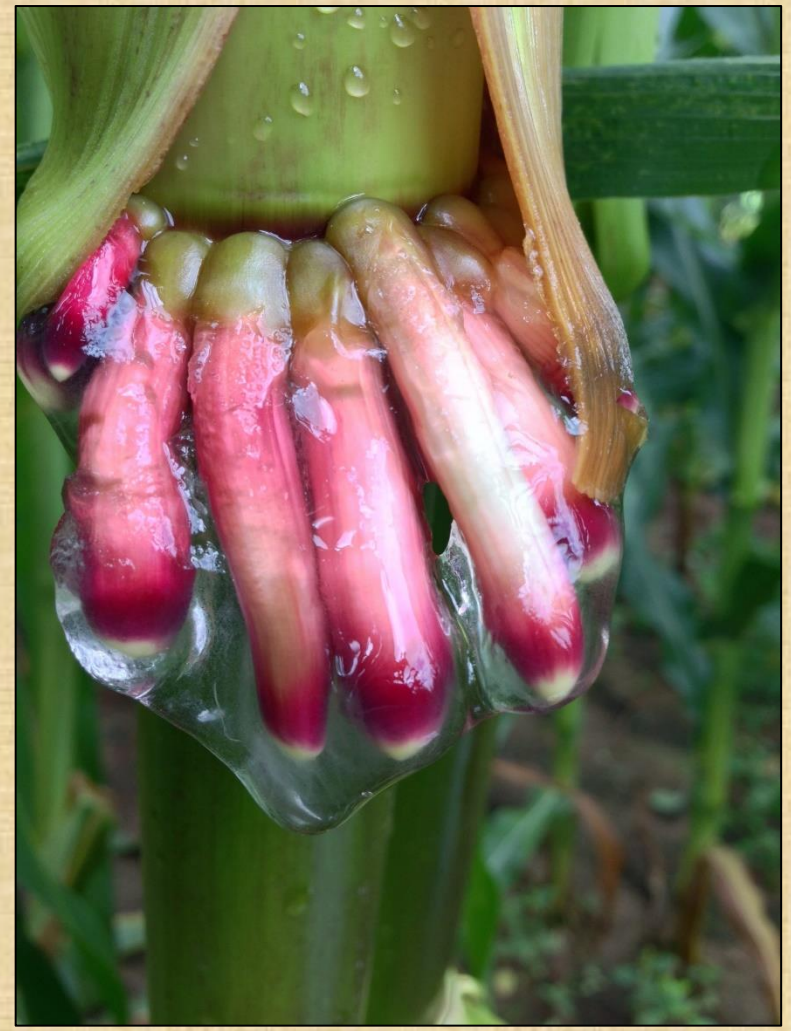
PURPLE PERUVIAN CORN

IMMATURE PROP ROOTS of PURPLE PERUVIAN CORN





MUCILAGE is FOOD for NITROGEN-FIXING BACTERIA



This landrace evolved over hundreds of years in low-nitrogen soil to fix its own nitrogen from the atmosphere, like beans and other legumes.

CHILE PEPPERS are a SOURCE of FLAVONES

CAROTENOIDS

Carotenoids are a class of naturally-occurring pigments that are sources of yellow, orange, and red colors of many plants. Carotenoids in food include α-Carotene, β-carotene, β-cryptoxanthin, lutein, zeaxanthin, and lycopene:

NAME	SOURCES
α-carotene	plantain, pumpkin, squash, carrots
β-carotene	sweet potato, spinach, carrots, collard greens
β-cryptoxanthin	papaya, sweet red peppers, oranges, tangerines
lutein, zeaxanthin	spinach, turnip greens, collard greens
lycopene	tomatoes, watermelon, pink grapefruit

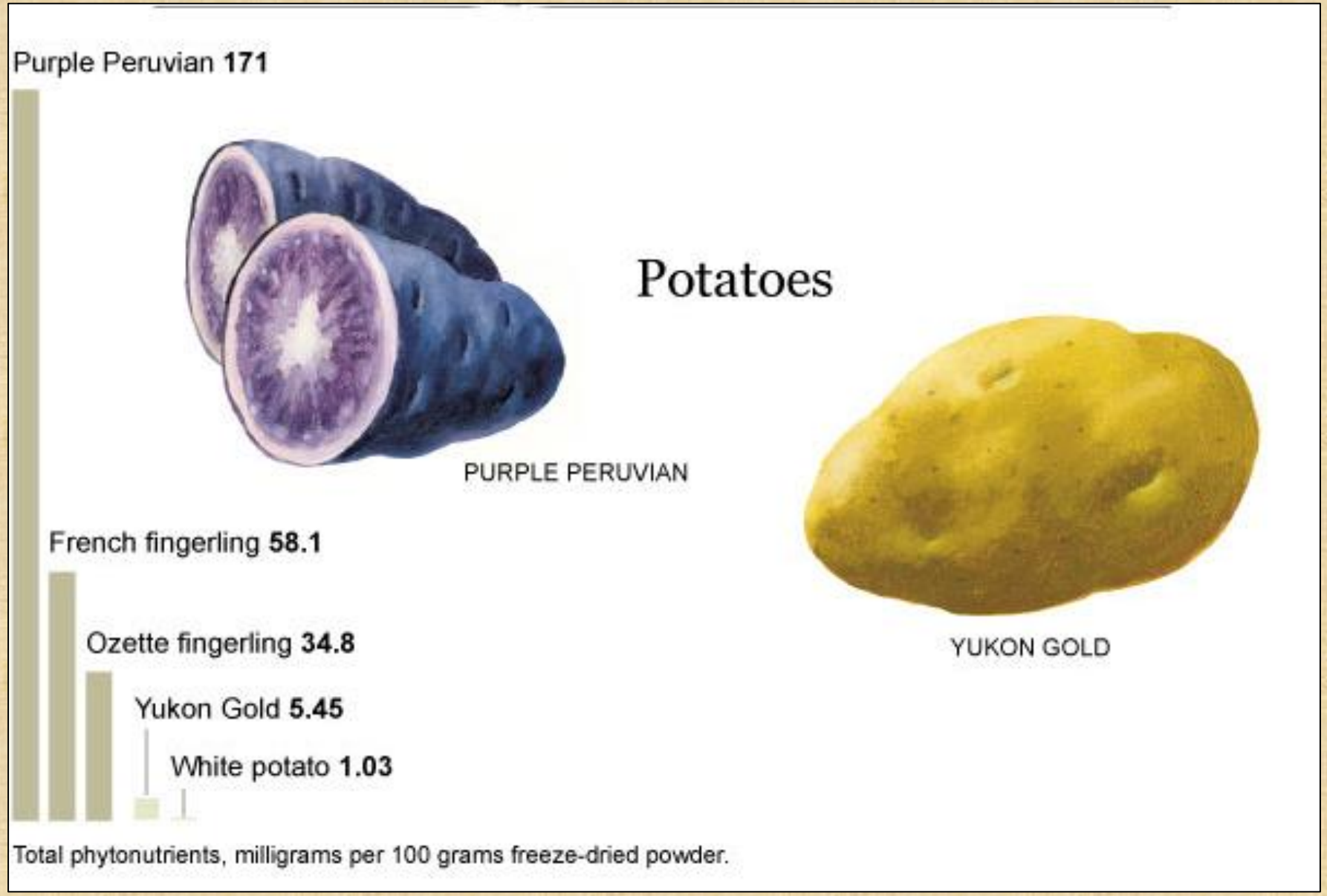
HEALTH BENEFITS OF CAROTENOIDS

- Antioxidant activity.
- Source of Vitamin A.
- Anti-Cancer effects through several mechanisms.
- Protection against macular degeneration.
- Protection against cardiovascular disease.
- Dietary lutein maintains cognitive health.

INDIAN PUMPKIN (OK), a SOURCE of CAROTENIODS

HEIRLOOM TOMATOES, a SOURCE of CAROTENOIDS

PHYTONUTRIENTS in POTATOES



PURPLE PERUVIAN POTATOES

The Nutrition Rainbow

Tips: The more naturally colorful your meal is, the more likely it is to have an abundance of cancer-fighting nutrients. Pigments that give fruits and vegetables their bright colors represent a variety of protective compounds. The chart below shows the cancer-fighting and immune-boosting power of different-hued foods.

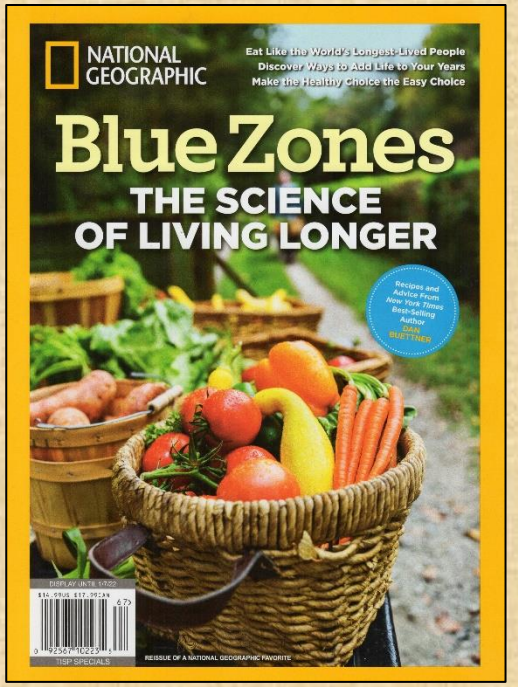
Colors	Foods	Colorful Protective Substances and Possible Actions
Red	Tomatoes and tomato products, watermelon, guava	Lycopene: antioxidant; reduces prostate cancer risk
Orange	Carrots, yams, sweet potatoes, mangoes, pumpkins	Beta-carotene: supports immune system; powerful antioxidant
Yellow-orange	Oranges, lemons, grapefruits, papayas, peaches	Vitamin C, flavonoids: inhibit tumor cell growth, detoxify harmful substances
Green	Spinach, kale, collards, and other greens	Folate: builds healthy cells and genetic material
Green-white	Broccoli, Brussels sprouts, cabbage, cauliflower	Indoles, lutein: eliminate excess estrogen and carcinogens
White-green	Garlic, onions, chives, asparagus	Allyl sulfides: destroy cancer cells, reduce cell division, support immune systems
Blue	Blueberries, purple grapes, plums	Anthocyanins: destroy free radicals
Red-purple	Grapes, berries, plums	Resveratrol: may decrease excess estrogen activity
Brown	Whole grains, legumes	Fiber: carcinogen removal

PhysiciansCommittee
for Responsible Medicine PhysiciansCommittee.org • 202-686-2210

23146-NTR • 20230314

NICOYA, COSTA RICA

THE INDIGENOUS BLUE ZONE



» TOP LONGEVITY FOODS *From Nicoya*

» **MAIZE NIXQUEZADO** Nicoyans make their own tortillas daily and eat them at breakfast, lunch, and dinner. They soak the corn in lime and water (calcium hydroxide) and then grind it into flour, which releases niacin locked up in the corn; increases the body's absorption of calcium, iron, and minerals; and reduces the risk of mold toxins.

» **SQUASH** Available in several varieties and called *ayote* or *calabaza* in Nicoya, these prolific hard-shelled squash are related to pumpkins and winter squash such as butternut, Hubbard, and spaghetti squash. All belong to the botanical family Cucurbitaceae, known for providing high levels of useful carotenoids.

» **PAPAYAS** Papaya trees grow almost like weeds in Nicoya, so people there eat this fruit, both green and ripe, almost every day. The papaya's rich orange flesh contains vitamins A, C, and E, plus papain, an enzyme that counters inflammation.

» **YAMS** A staple for at least the past century, Nicoya yams are botanically unrelated to North American sweet potatoes, although they are similar in appearance. They are, in fact, true yams. Their flesh is firm and white, even when cooked, and they are a rich source of vitamin B_6.

» **BLACK BEANS** Nicoyans eat beans and rice every day, often at every meal. The black beans they depend on contain more antioxidants than any other type of bean and are arguably the best in the world. Paired with corn tortillas and squash, they make the perfect food.

» **BANANAS** In all of their shapes and sizes—large and small, plantains, *cuadrados*—bananas are a rich source of carbohydrates, potassium, and soluble fiber. They are nearly a staple food in Nicoya. The sweet varieties are picked fresh, peeled, and eaten—the go-to snack. Some types, like the plantain, do not sweeten as they ripen. Instead, they are boiled or fried and served like a potato.

» **PEJIVALLES (PEACH PALMS)** Clusters of this small orange oval fruit dangle from palm trees. A staple food for Costa Rica's Indigenous people yet rarely sold in the United States, it is especially high in vitamins A and C. Traditionally the fruit is boiled for 10 minutes and served cold. It tastes like a cross between sweet potatoes and palm hearts.

SEED SOURCES

- *Native Seeds Search*: https://www.nativeseeds.org/pages/seeds
- *Ramona Farms*: https://store.ramonafarms.com/
- *Siskiyou Seeds*: https://www.siskiyouseeds.com/
- *Wild Garden Seed*: https://www.wildgardenseed.com/
- *PEIMCO* https://peruvianimport.com/incas-food-products

REFERENCES

Phytochemicals

https://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals

Plant Polyphenols as Dietary Antioxidants in Human Health and Disease

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2835915/pdf/omcl0205_0270.pdf

Nutritional Value and Health Impacts of Traditional Native American Foods: A Literature Review

https://www.hungercenter.org/wp-content/uploads/2019/03/Report_Alekya.pdf

Breeding the Nutrition Out of Our Food

https://www.nytimes.com/2013/05/26/opinion/sunday/breeding-the-nutrition-out-of-our-food.html?src=me&ref=general&_r=0

Your Body Already Has a Built-In Weight Loss System

https://theconversation.com/your-body-already-has-a-built-in-weight-loss-system-that-works-like-wegovy-ozempic-and-mounjaro-food-and-your-gut-microbiome-220272

Peruvian Andean Maize: General Characteristics, Nutritional Properties, Bioactive Compounds, and Culinary Uses

https://www.sciencedirect.com/science/article/pii/S0963996919308208/pdfft?md5=edf5c632163ce2885a6832894889cbe9&pid=1-s2.0-S0963996919308208-main.pdf

Food Sovereignty and Climate Change

Emily Luscombe
Natural Resources Director
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Intertribal Agriculture Council:

Four decades of advocacy for Tribes and Tribal Agricultural Producers

IAC Membership

Policymaking - Voting membership guides the annual priorities of the organization.

Advocacy - Membership entitles Tribes to participate in various events, meetings and committees, including the Annual Membership Meeting held at IAC's Annual Conference every year in December.

For questions, contact the main office at 406-259-3525 or Nicole Charley at nicole@indianag.org

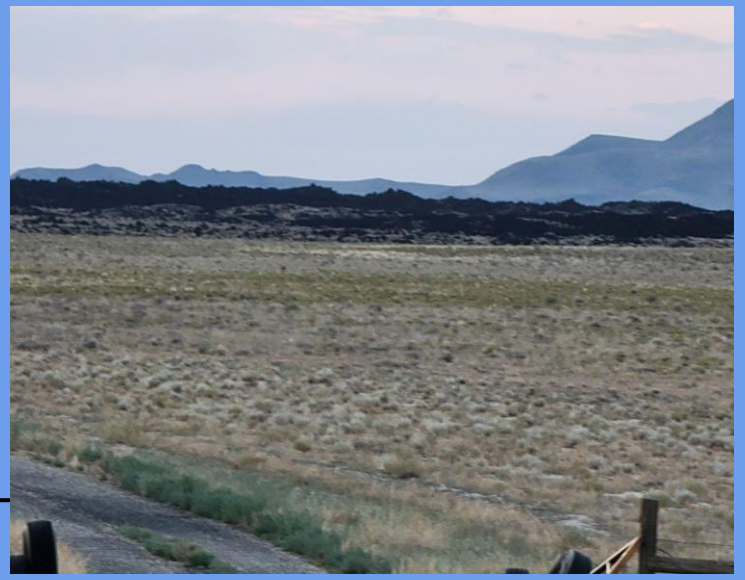
Food sovereignty and food security

- In the past there was more separation between sovereignty and security, but with the impacts of climate change it is becoming more important to have food sovereignty in order to have security in food systems
- Extreme events can impact crops, transportation of foods, priotiization of who gets food supplies, etc.; so the more sovereignty there is in food production the higher the food security.
- It is also important in the quality of food and reduction in disease risk factors in communities to have control over the production of the food

Grow North Farms, Anchorage: A lot can be done in small spaces

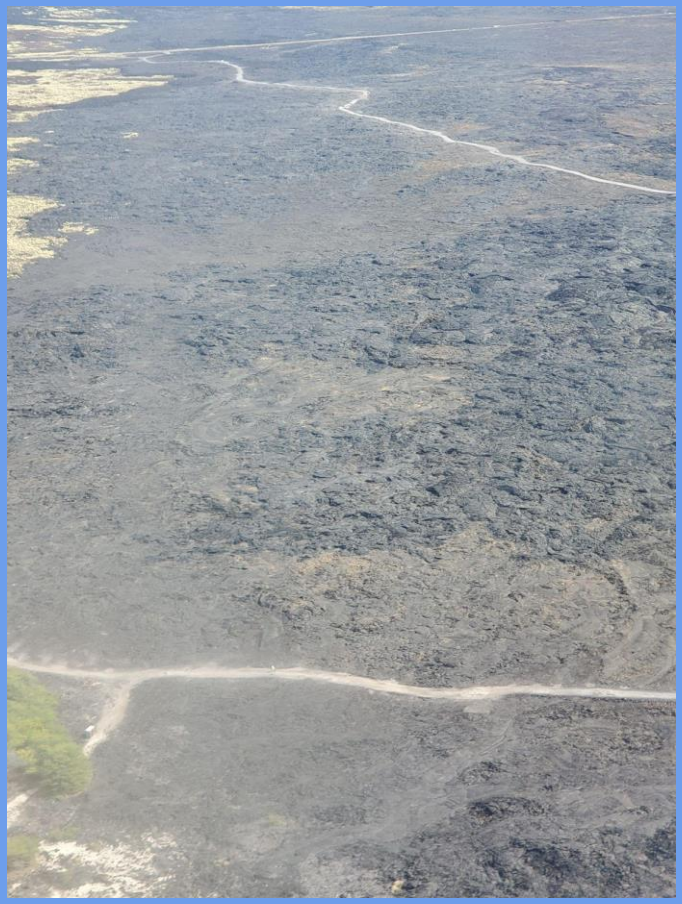
We Must Consider Our Region and Climate in Planning What Practices to Use

- There are differences in every region and climate that are going to impact what practices are practical or how we adapt those practices
- Place based knowledge and the use of traditional methods is often the most sustainable way to practice agriculture
- When changes have been significant and fast we can adapt our methods to those changes
- When we have changes like long and extended droughts its helps to look for other bio regions that have similar climates and share knowledge with those Tribes to find effective adaptations
- Know your indicator species and keystone species for your area and monitor for changes
- Even within this region there are many microclimates that have different conditions



We Have Adapted to Changes in Climate Since Time Immemorial

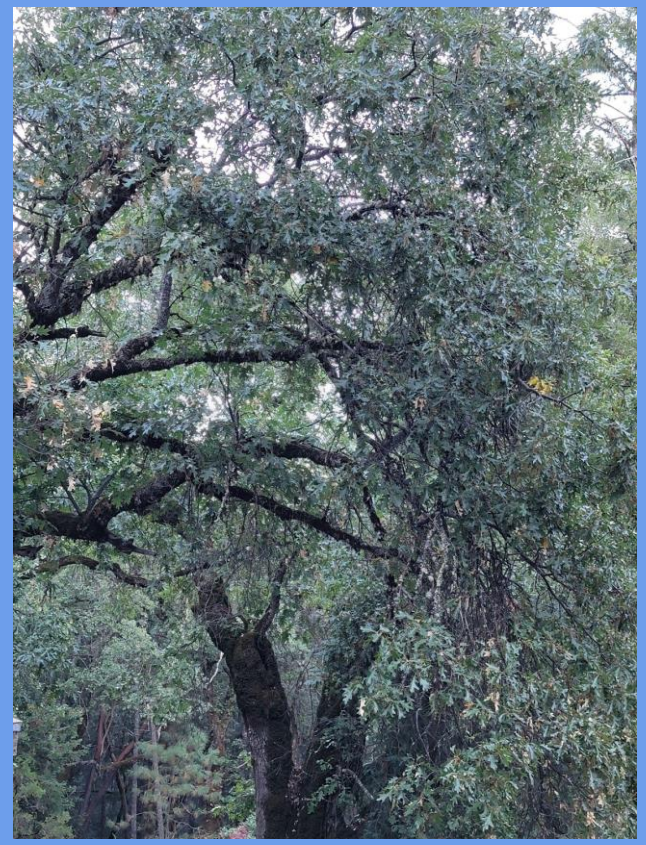
- Climate has changed over time for many different reasons, but we have a history of adapting to these changes
- The changes we are seeing currently are faster than many past changes, especially when changing to a warmer climate
- We can still use lessons from the past and combine these with current science to adapt and mitigate the rate of change for the future
- Extreme drought has caused famine and movement of people in the past, however if we look at lessons learned over time and combine that we information we know today we can create more effective strategies
- The ability to predict changes that are coming and long term weather patterns now is helpful in our planning



Volcanic activity is one of the drivers of climate change in the past

TEK and food production with climate change

- TEK is important in helping to protect food security during climate change.
- TEK is place based science that has been tested, experimented, and adapted since time immemorial.
- As such it gives us information on things that have helped with past climate shifts and extreme events, micorclimates, species to monitor, calendars for planting in each area, varieties of seeds designed for specific microclimates, etc.
- Understanding what foods were eaten traditionally even if they have been impacted by climate change can help you focus on similar foods to replace those in the diet to reduce adverse health effects.
- TEK gives us an understanding of harvesting and carrying capcity, disease reduction, etc. that can be even more important with climate change. For example the pile burning under trees after acorn harvest. This disease and insect reduction stragegy becomes even more important as they increase with climate change.



TEK you probably know more than you think you do

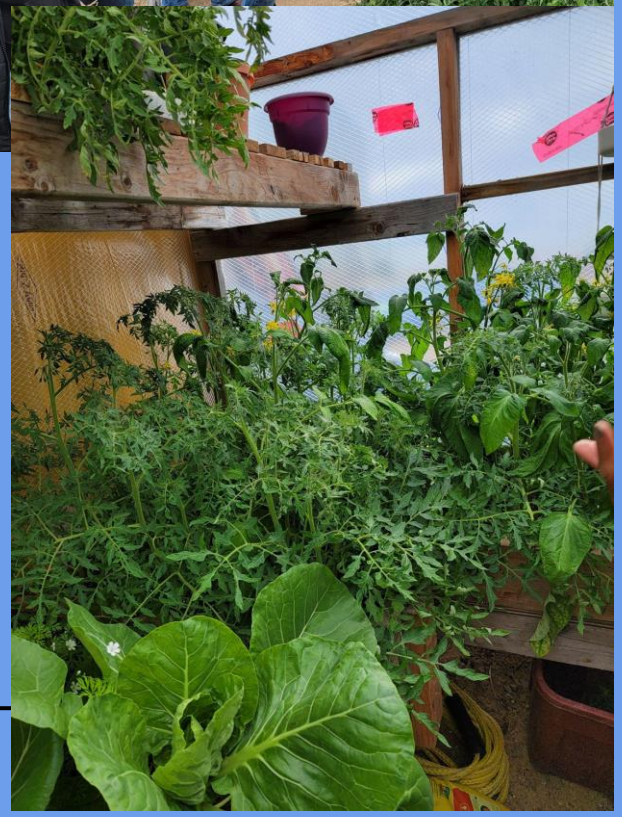
- Sometimes people know a lot more traditional knowledge than the realize because it's in proverbs, song lyrics, calendars, stories, and even place names.
- For example place names can give you a history of climate change because if they are telling you that a water loving plant used to grow in that area because the name of the place is where that plant is picked and you don't see it now and the area is dry you can track the change in climate. Conversely, it can alert you to areas where things used to be and have moved because of human influence, but will let you know microclimates that are good for growing
- Past changes in climate although they may have been less severe had adaptations that were made and the stories and TEK about that can help us now

Threats from Climate Change

- With most Reservations on marginalized and land and without the ability to just move the impacts of climate change are felt acutely by many Tribal people with extended droughts, floods, sea level rise, coastal erosion, melting permafrost, changing currents, loss of important species etc.
- Some areas are feeling the impacts of climate change faster and more severely than other.
- Alaska is one of those places feeling the impacts very quickly with some villages needing to move, some traditional foods that are depended upon becoming more scarce, etc.
- Transportation to rural areas, but especially to areas not on the road system makes the import of foods to supplement the loss of traditional foods costly, difficult, and they often do not arrive in a consumable state.

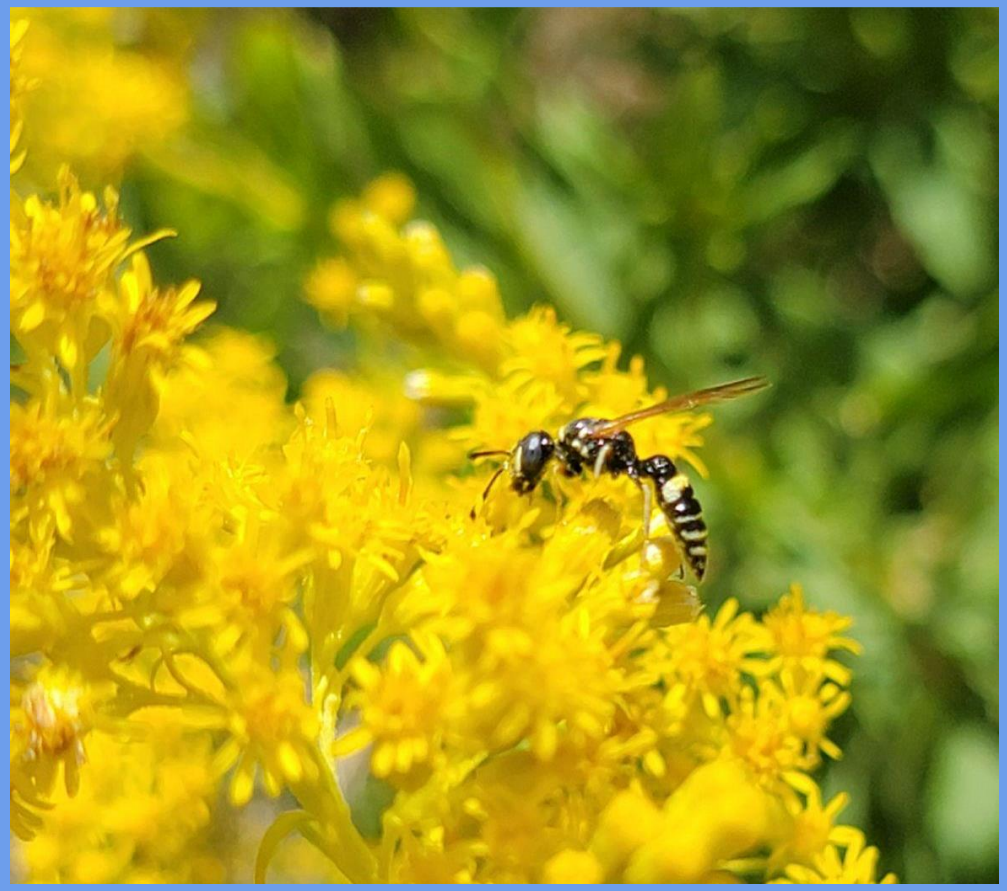
“Urban” Agriculture/ Community gardens

- When traditional foods are lost Urban Agriculture and Community gardens to help to combat some of the loss of fresh foods. Even in a rural area you may qualify for “Urban” agriculture assistance https://www.usda.gov/topics/urban/grants and other grant funding programs that IAC can help you to identify.
- Replacing traditional foods that are dwindling with foods as similar as possible can help prevent negative health outcomes. Ie. foraged greens can be replaced with propagated greens, etc.
- Programs to get hoop houses and other climate control measures can help to prevent against some of the impacts of higher winds, unexpected temperature fluctuations, extend the growing season, etc.
- These measures can be using in combination with traditional knowledge to enhance climate resilience.



Whole Ecosystem Function

- The value of ecosystem function is worth more than the sum of its parts
- We cannot look at soil, water, air, habitat, microbiomes, etc. separately as if they do not impact one another
- Nature works with cycles and systems that are all interconnected and in imbalance in one systems will create an imbalance in another
- Indicator species are the first signalers that an imbalance is occurring and should be monitored for
- Keystone species will create food chain collapse when disrupted and the loss of keystone species generally comes after ignoring signs from indicator species
- Everything that happens in an ecosystem impacts other things in the system
- Climate change impacts can have a cascading effect through the ecosystem and food system

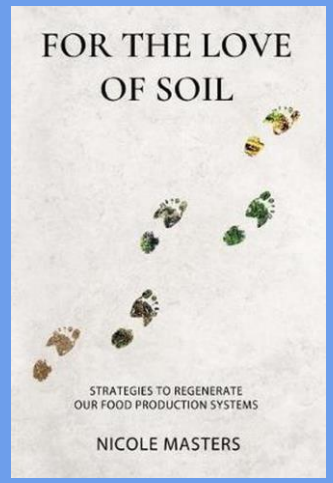


Online Resources for Tribal Producers and Tribes

- Mighty Networks: Online curriculum curated by IAC Staff with workshops
- Sign Up: https://intertribal-agriculture-council.mn.co/share/P6EcIsnpGwZBUh13?utm_source=manual
- Youtube: Hours of content from previous conferences, webinars, and presentations
- IAC Newsletter: Sign up for weekly updates and policy briefs!
- Social Media: Follow us on Facebook and Instagram

Resources for Building Soil Health and Ecosystem Function

- For more information on soil science and agriculture some of the people I suggest looking up on YouTube and reading their books are:
- Nicole Masters
- Dr. Elaine Ingham
- Alejandro Carrillo
- Gabe Brown
- Ray Archuleta
- Dr. Christine Jones
- Allan Savory
- Didi Pershouse
- Fred Provenza



This is not an exhaustive list and is in no particular order, but is a good starting point for easy to digest further information. There are also a lot of resources on USDA NRCS websites, extension service websites, and a number of non profit organization. I am happy to direct you to more resources.

SAVE THE DATE

December 10-12, 2024

Palms Casino Resort
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2024 IAC ANNUAL CONFERENCE

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