

# Converting Urban Food Deserts to Food Oases

## - Community Scale Aquaponics -

Presenters:

**Paul Schissler**, Paul Schissler Associates

**Henning Gatz**, Founder, Aquacare Environment

**Mark Buehrer, PE**, Director, 2020 ENGINEERING

**Rose Lathrop**, Program Director, Sustainable Connections



Paul Schissler Associates

AQUACARE



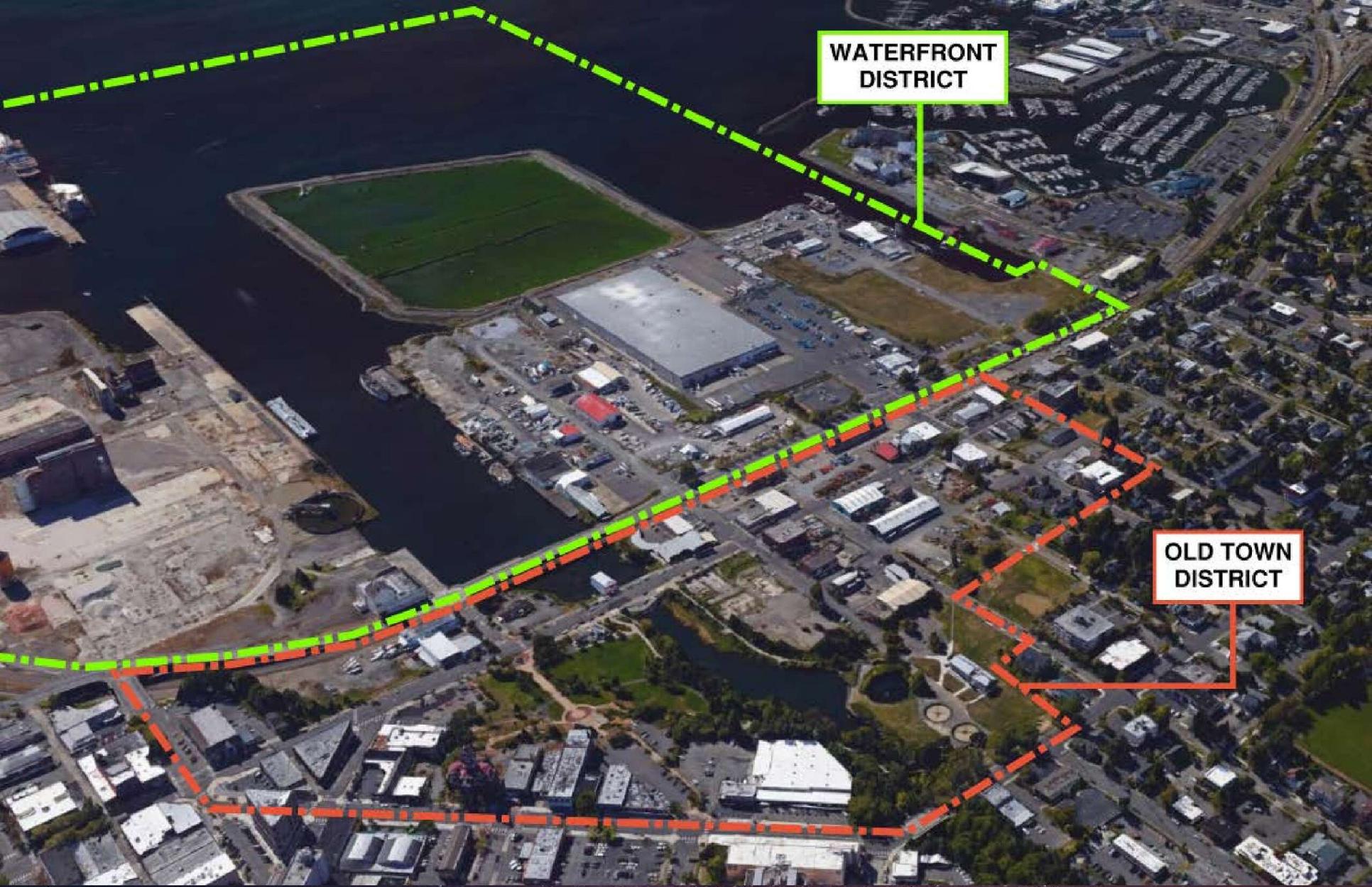
# Bellingham Waterfront & Old Town





**WATERFRONT  
DISTRICT**

**OLD TOWN  
DISTRICT**



WATERFRONT DISTRICT

OLD TOWN DISTRICT



URBAN FARM SITE

# Why talk about **Food & Water?**



## It's all about the people!

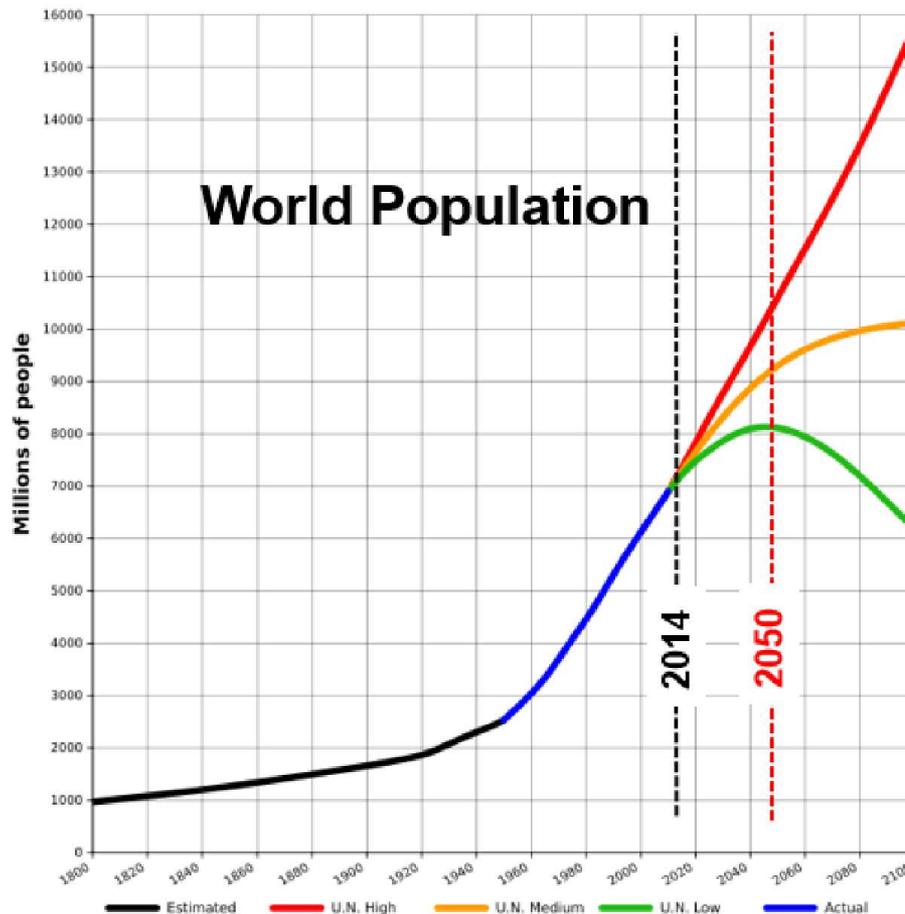
As the world's population continues to grow, now at a rate of about

10,000 people per hour

the same finite water and nutrient resources that are used for drinking water and food production are going to have to go farther and be treated wisely.



# Why talk about Food & Water?

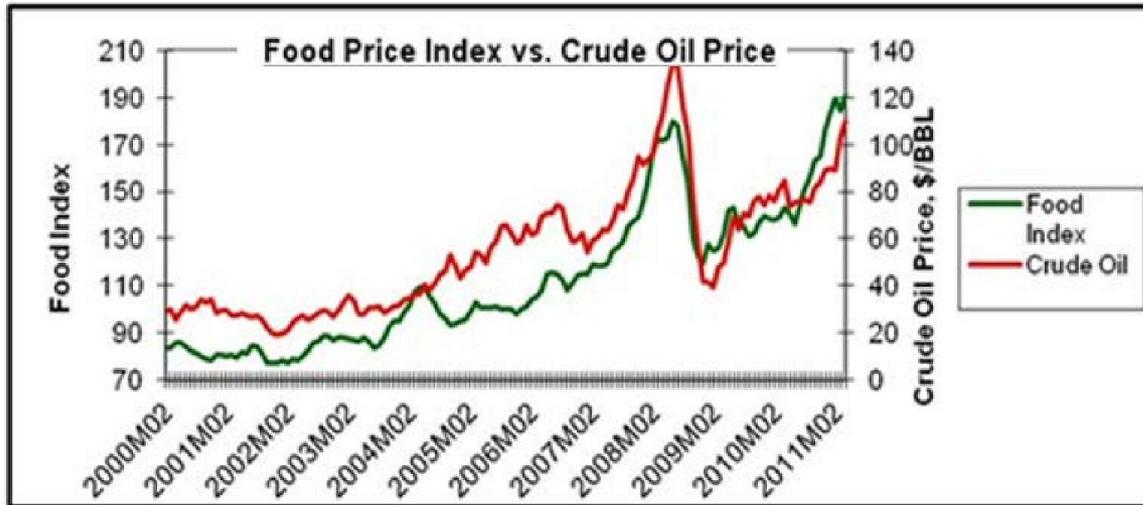


By 2050, the United Nations estimated the world population to be:

- ❖ 10.5 billion
- ❖ 9.1 billion, or
- ❖ 8.0 billion

# What is the tipping point?

# When will it occur?



Source: IMF – Primary Commodity Prices



What is the most important energy stored on Earth?

# Food

We can live without oil, coal and wood.

How long can we live without food?

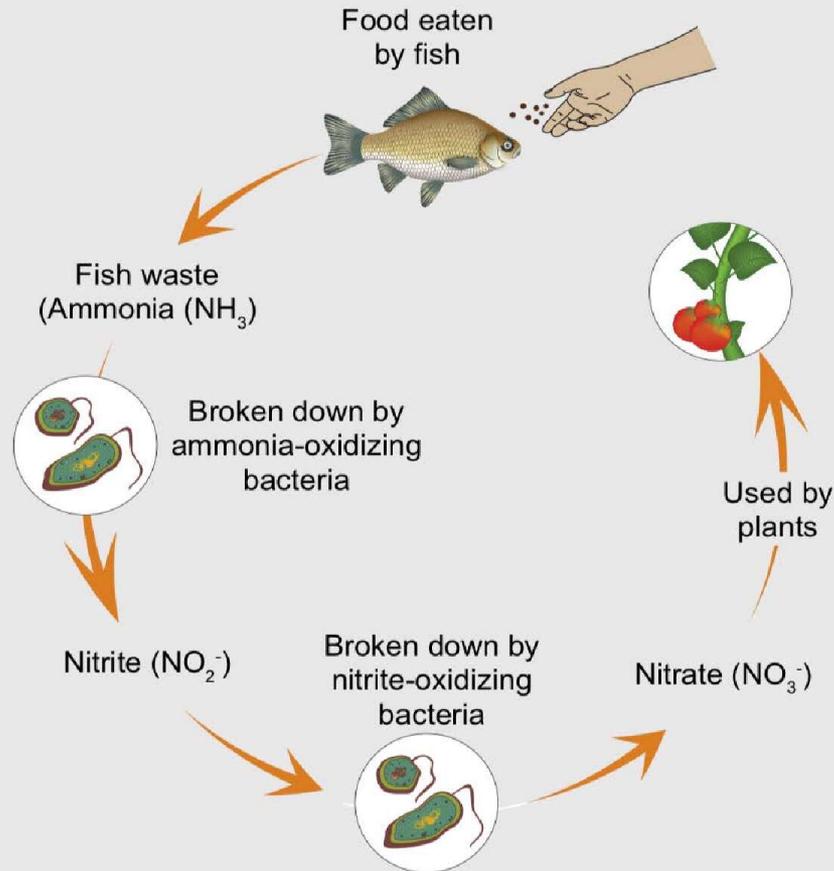
How is the energy value in food expressed?

Calorie: The energy needed to raise the temperature of 1 gram of water by 1 ° C.



# Aquaponics (Aquaculture + Hydroponics)

## Closed-Loop Water & Nutrient Systems



# Feeding the World with Recirculating Aquaculture and Hydroponic Systems ( AKA “Aquaponics” )



Henning Gatz  
Aquacare Environment

**AQUACARE**

Aquacare Environment Inc  
708 Coho Way  
Bellingham WA 98225 USA

# Comparison of Protein Sources

Feed Conversion Rate =  
Units of Feed\* to produce Unit of animal protein\*\*

Cattle 8:1

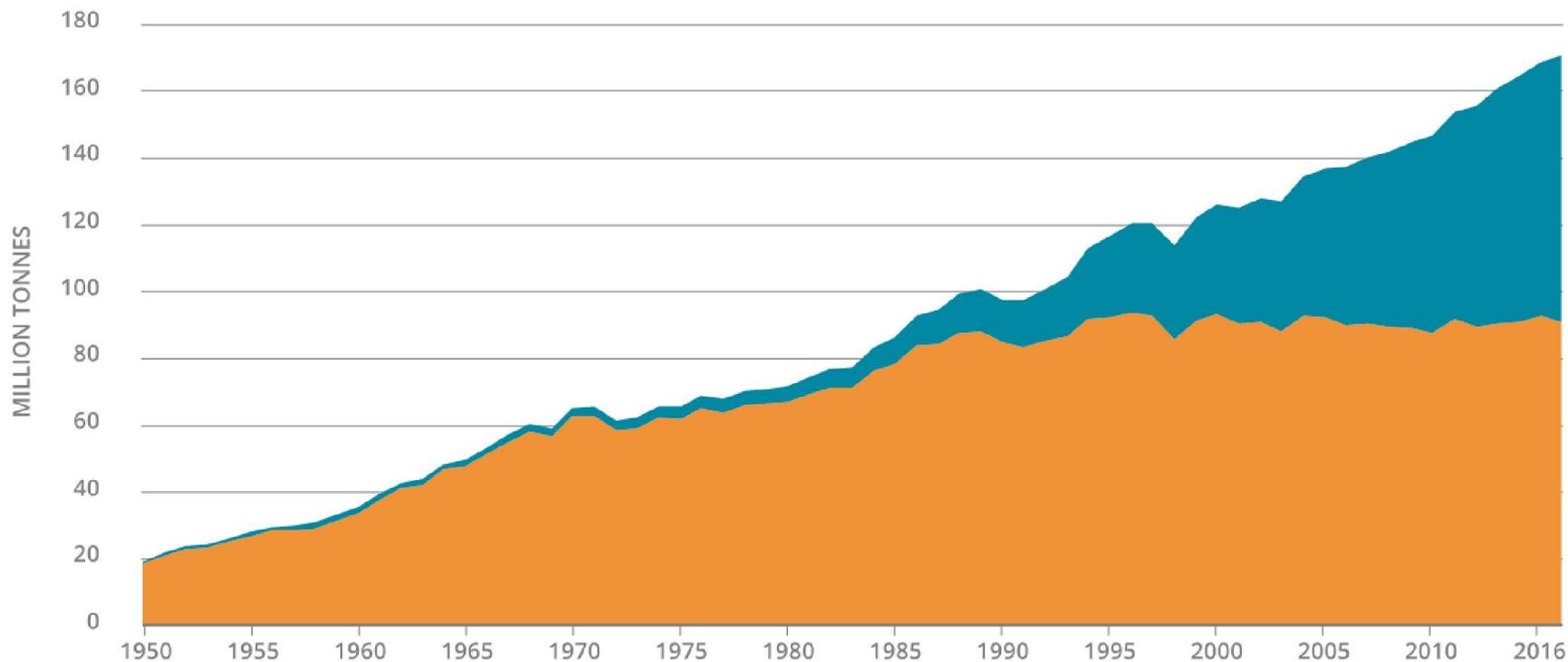
Hogs 4:1

Poultry 2:1

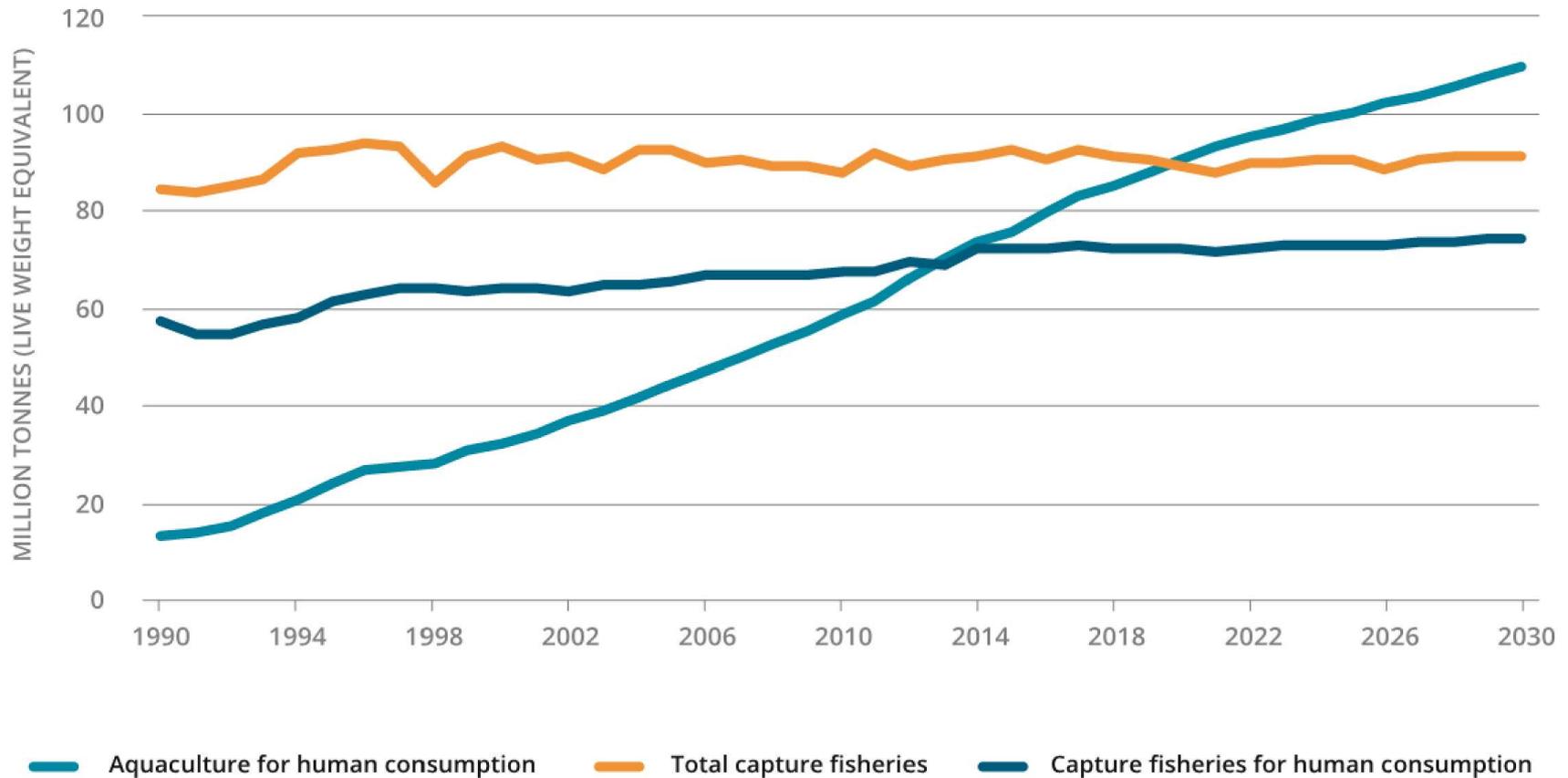
Fish 1:1

\*As fed weight, dry    \*\*Live weight, wet

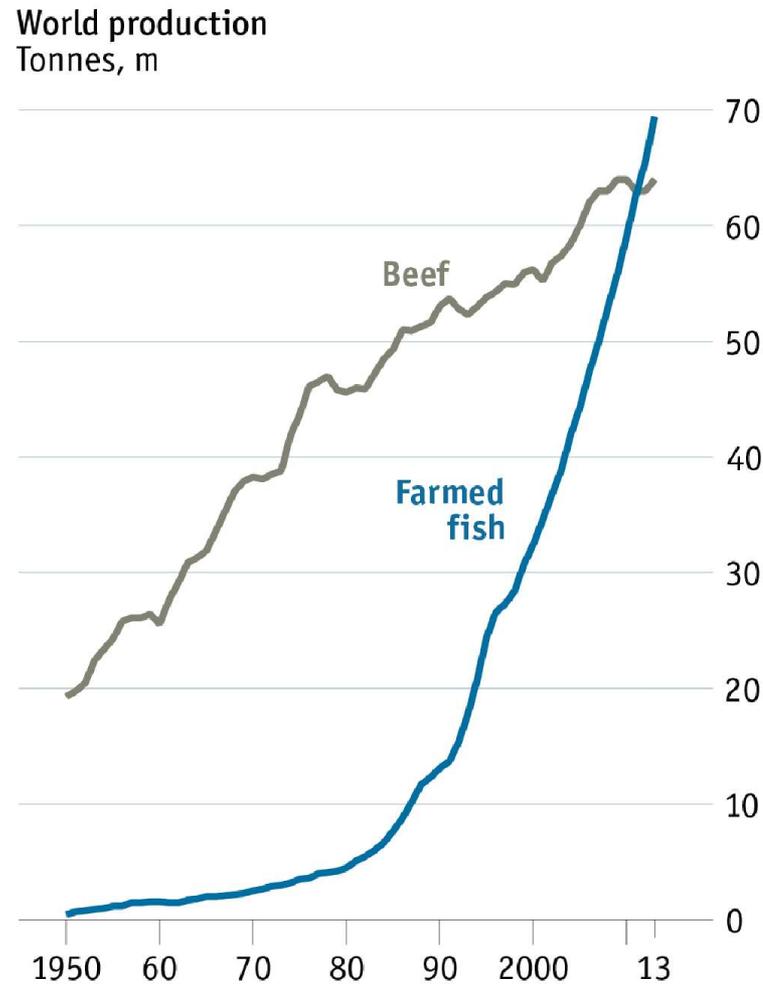
# Global Capture Fisheries and Aquaculture Production



# Global Capture Fisheries and Aquaculture Production (1990-2030)



# Fish Farming Tops Beef Production in Race to the Plate



## Types of Aquaculture



**Extensive**, requires large land area, low productivity, mild climates

Aquaculture has been practiced for thousands of years...



## Types of Aquaculture



Intensive, open water cages, higher production, environmental risk, labor intensive, moderate climate



# Types of Aquaculture



**Intensive, open ocean,  
submersible cages,  
higher production, risk, labor**

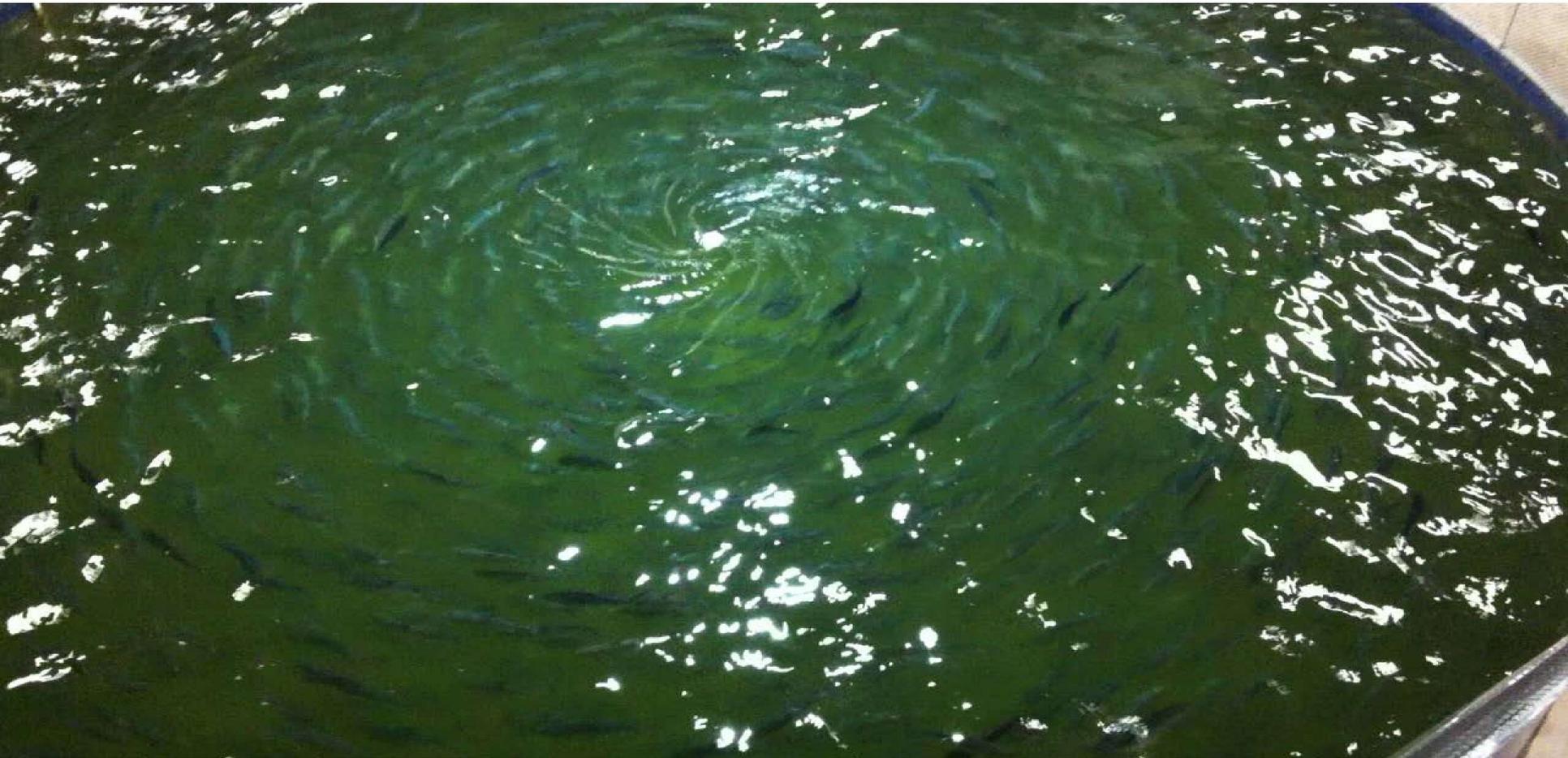


## Types of Aquaculture



**Recirculating Aquaculture Systems (RAS)** can locate anywhere, minimum water use, high output, optimum growth rate, any species fresh fish close to market, no impact on surrounding environment, excellent control of fish health, environment

Circular tanks are self-cleaning and exercise the fish for optimum growth.

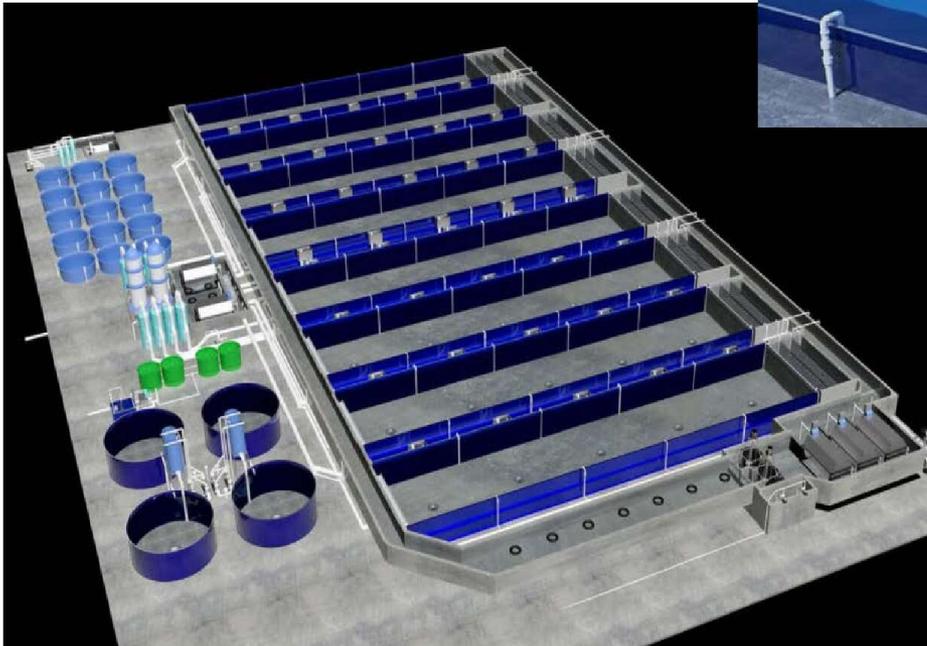
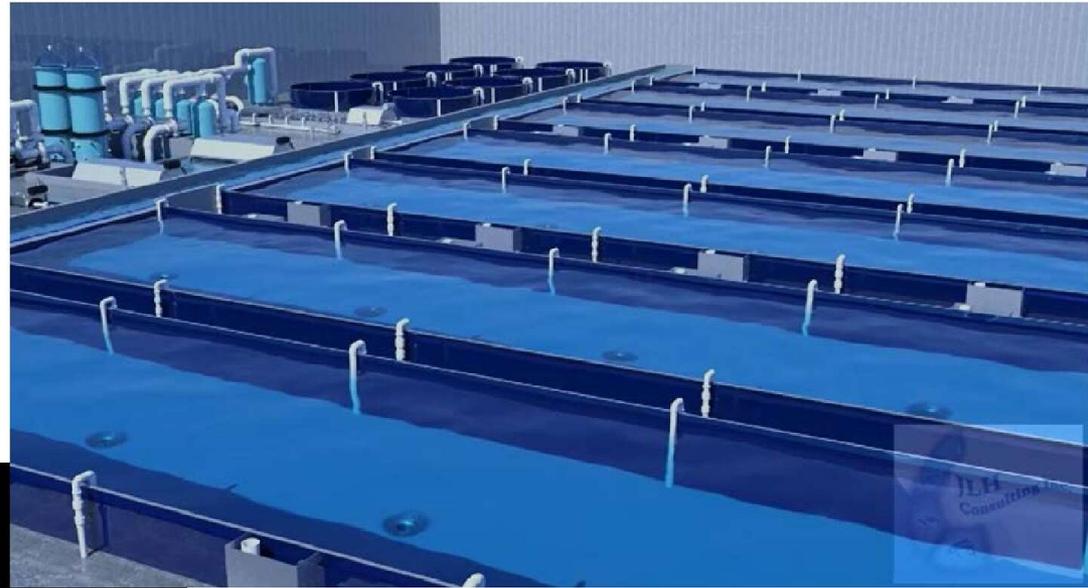


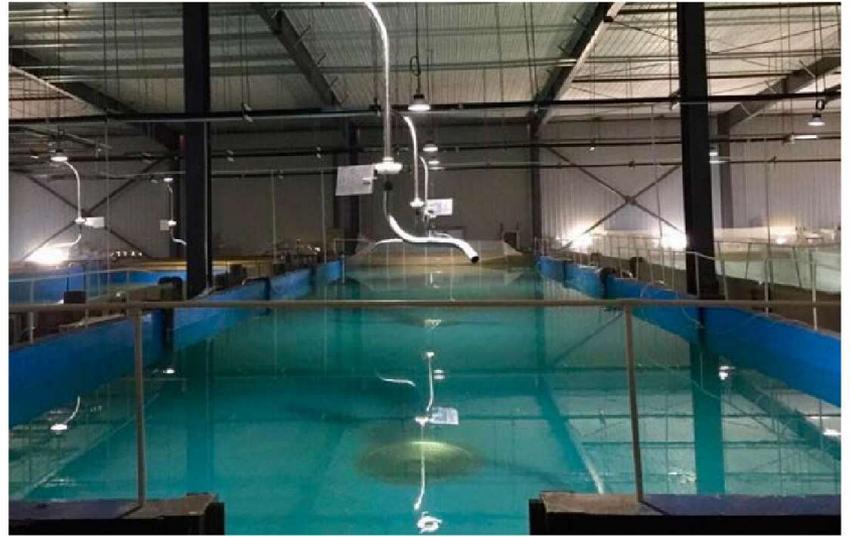


Barramundi (Sea Bass)



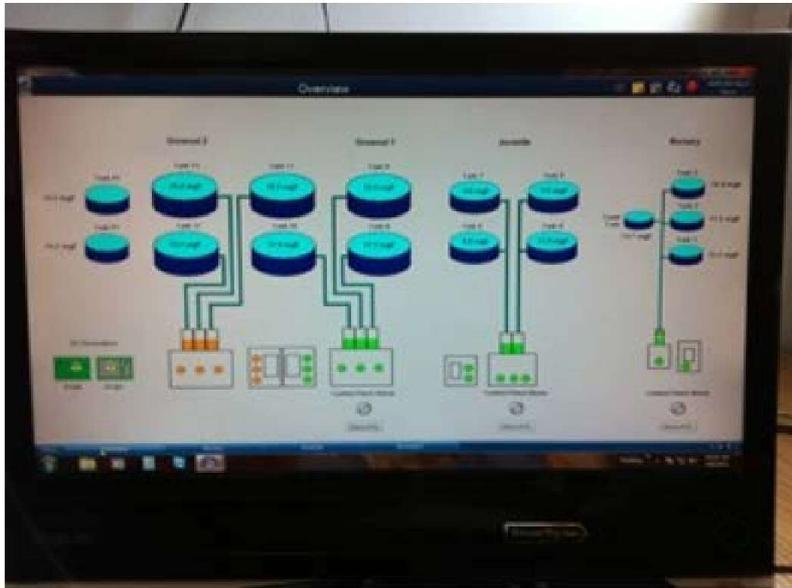
# Mixed Cell Raceway Design





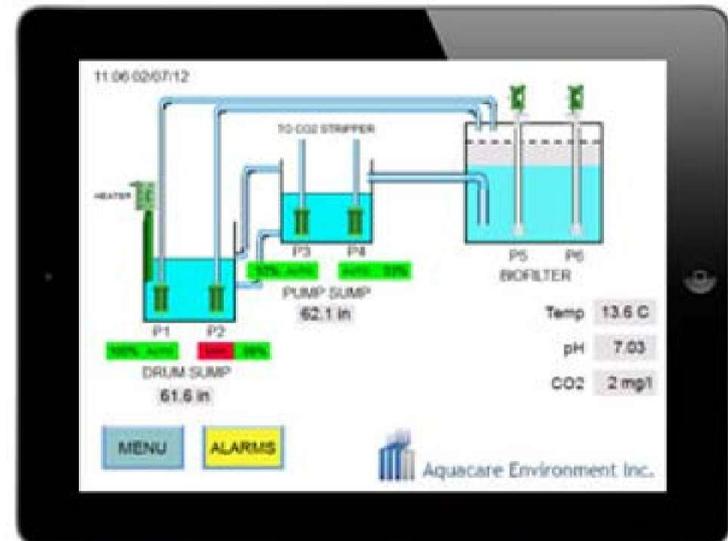
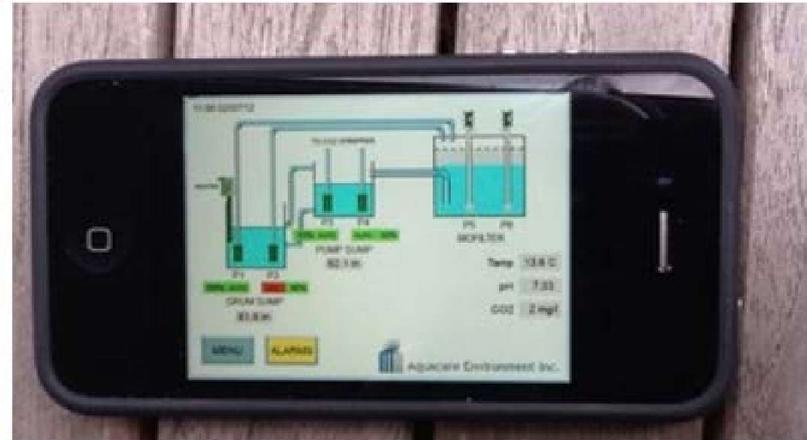
## Mixed Cell Raceway Design





Computer control, monitoring and alarms

Real time system status can be monitored via the Internet





Integrating Aquaculture and Hydroponics is called Aquaponics, two crops from the same system









# Dayton Valley Aquaponics LLC (formerly Hungry Mother Organics)



# Vine Crops



# Leafy Greens



# Basil & Lettuce





# MEET YOUR FARMER

# Bellingham Food Campus



Paul Schissler Associates

# Community Economic Development Benefits and Components



# Community Economic Development

- ✓ Social venture and social enterprise
- ✓ Layers of community benefit
- ✓ Shared revenue for venture partners
- ✓ Demonstration of urban food production
- ✓ Offering jobs, training, and education
- ✓ Public-Private cooperation



# Community Economic Development

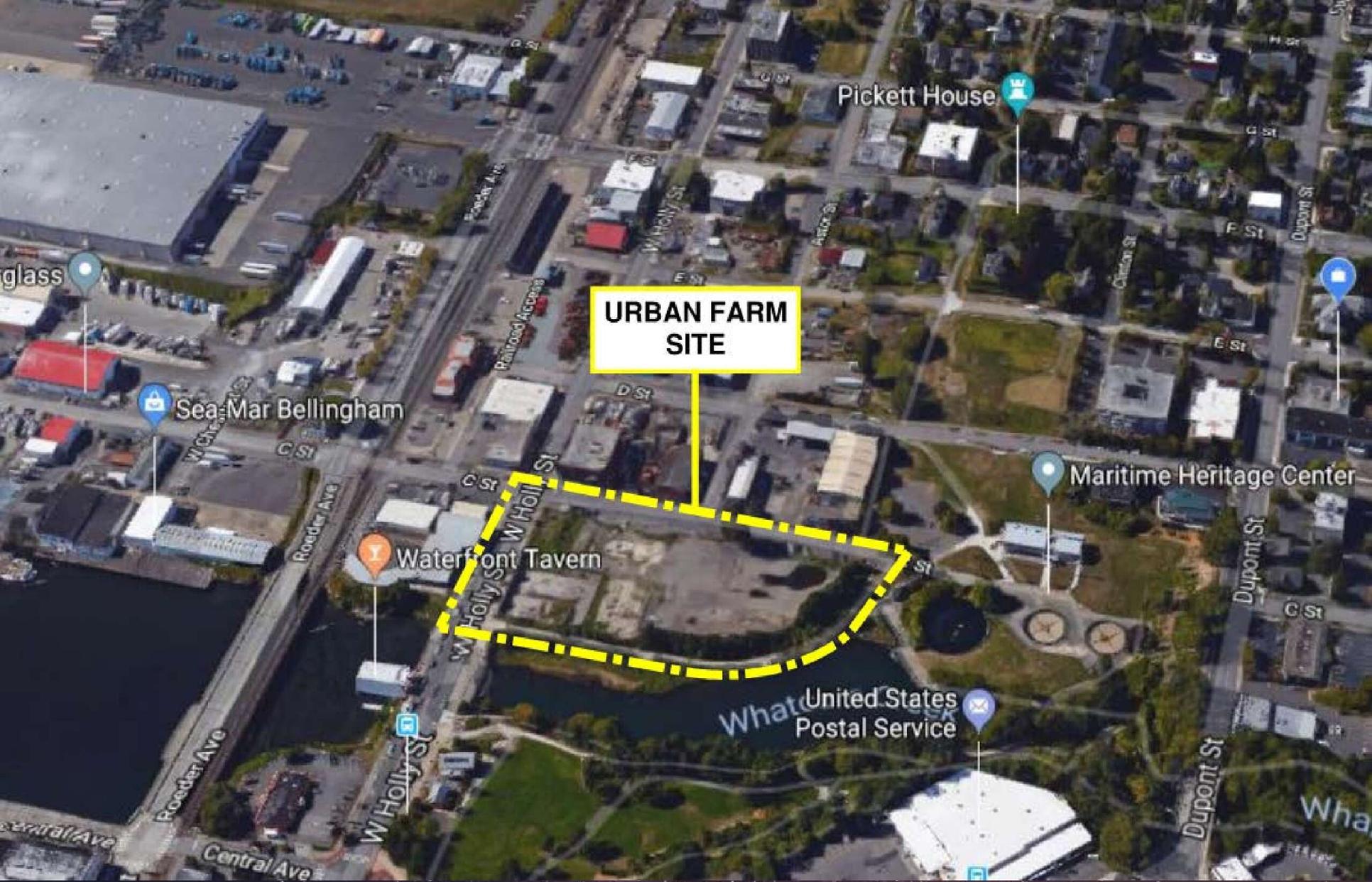
- ✓ Private enterprises co-locating with nonprofits
- ✓ Reusing urban land for productive purposes
- ✓ Requires no displacement of neighborhood uses
- ✓ Balance of private enterprise and public benefit



# Components of CED Projects:

- ✓ Community Development Corporations (CDC)
- ✓ Community Development Financial Institutions (CDFIs)
- ✓ Community Land Trust as CDC and/or landowner
- ✓ Community Action Agency as sponsor or partner
- ✓ Public agencies as sponsors and partners
- ✓ Community foundation - benefactors and investors
- ✓ Social impact investors and CDFIs





**URBAN FARM SITE**

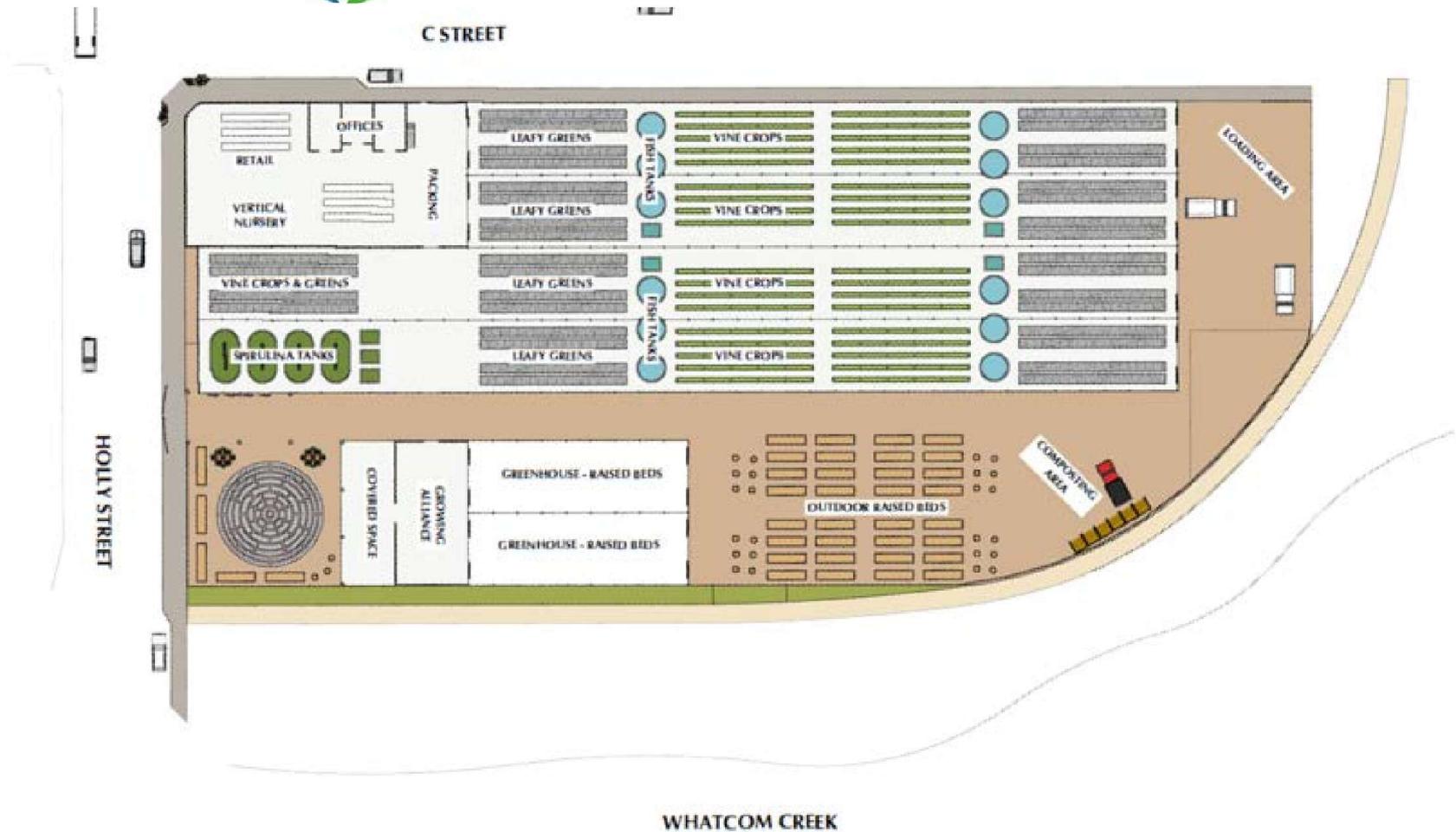


# Bellingham Organics





# Bellingham Organics





## From farm-to table in 12 hours or less

**Proposed Bellingham Organics would provide organic, locally-grown food year-round**

If approved, the proposed Bellingham Organics urban aquaponics facility on ugly Bellingham property in disrepair would bring a whole new perspective on "farm-to-table fresh" food. The company would serve up fresh, locally-grown organic fish, vegetables, and herbs harvested in the

"Aquaponics is a combination of fresh water aquaculture (fish/shrimp – protein production) and hydroponics (growing vegetables, greens, and herbs without soil). The nutrient-rich water from the aquaculture tanks is used to irrigate and fertilize the plants, and then the water is recycled back to

# City got involved...

## Revived their 2008 Old Town Urban Village Plan



# Old Town Urban Village Plan



# Brownfield Site: Historic Lumber Mill (1852) + Landfill Areas



# Cover Contaminated Areas (Remediation)



# Lower Level - Aquaculture Floor Plan



# Upper Level - Hydroponics Floor Plan



# Upper Level - Greenhouse Enclosure



# Mixed-Use Redevelopment + Aquaponics

(Food Production, Restaurants, Retail, Offices + Market Rate Residential)



# Lower Level - Aquaculture Floor Plan



# Mid Levels – Residential Floors



# Upper Level - Hydroponics Floor Plan



# Upper Level - Greenhouse Enclosure



# Mixed-Use Residential Redevelopment + Aquaponics

(Food Production, Restaurants, Retail, Offices + Market Rate & Work Force Residential)





# Converting Urban Food Deserts to Food Oases



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