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WHAT'S NEXT?? UMASS ZOOM SUMMIT

SUSTAINABILITY & CLIMATE RESILIANCE: COASTAL COMMUNITIES, ENERGY, AND TRANSPORTATION

The University of Massachusetts is pleased to extend an invitation to a "zoom summit" in Sustainability and Climate Resilience: Coastal Communities, Energy, and Transportation on **January 29, 2021 from 3:30-5:00 pm**. We will introduce industry leaders, their colleagues in business strategy and government relations, to some of the most important breakthroughs of recent years in **four key fields in "Sustainability and Climate Resilience."**

In the final hour, we invite you to discuss **grand challenges** that will command attention in the next decade. Accomplished scientists from across the five campuses of the University of Massachusetts will be on hand to discuss the most pressing translational questions in the post-COVID period.

Major research breakthroughs (30 minutes):

Climate and marine science research across UMass

- Unique network of coastal research stations from Cape Anne to Nantucket
- Observing and modeling ocean systems
- Climate change impacts on coastlines, water resources, and food security
- Development of Coastal Urban Adaptation Strategies
- International impact of sea level rise research
- Nature Based Solutions

Renewable Energy

- Floating wind turbines that use multi-line anchor systems; dramatic reductions in materials and installation cost for offshore wind
- Marine Renewable Energy and Fisheries studies in offshore wind development
- Highly efficient, easy-to-manufacture solar energy: power conversion efficiencies of more than 21% in perovskite-based solar cells with more than 4500 h of stability

Transportation and Infrastructure

- Pavement mixtures increase performance and lifespan; up to 50% recycled materials.
- Multimodal transportation systems operations and safety:
  - developed and delivered Complete Streets to 82% of cities/towns in Massachusetts within two months
  - novel highway project scoring criteria that account for the health impacts of transportation.

Food Security

- Number 1 Ranked Food Science Department and Top 5 Agricultural School
- Leadership in Aquaculture production, permitting and siting
- Revolutionizing the food system: production to distribution and conversion of waste streams
- Food-Water-Energy Nexus
- Sustainable Fisheries

Grand Challenges (60 minutes):

Our most accomplished researchers will be on hand for a back-and-forth discussion of these five pressing problems. We will foreground where we're going in these domains, but are curious to learn, is this where you are headed? Are there other directions to consider?

Breakout group 1: Thriving Coastal Communities and the Blue Economy

Protecting coastal communities and expanding the Blue Economy, the collective activities that generate sustainable prosperity from the world's oceans and coastlines, represent key regional and global challenges.

- Nature-Based Solutions for coastal flood protection provide many environmental and social co-benefits besides flood protection.
- Tidal marshes along the Atlantic coastline, which provide critical habitat and protection from storm events are threatened by coastal development and climate change impacts.
    - Develop a framework for predicting marsh resiliency based on remotely sensed observations and oceanographic and geologic datasets.
    - Enable coastal managers to identify marshes most vulnerable to climate change and evaluate the potential success of restoration efforts.
- The Northeast Center for Coastal Resilience is developing actionable coastal science to inform policy and local decision making and support blue economy.

Breakout group 2: Clean and just energy transition (net-zero carbon by 2050)

Offshore wind energy; wave energy conversion; high-efficiency, cost-effective solar; reliable electricity through energy storage and demand response

- Sustainable Food Systems and in particular sustainable marine aquaculture.
- The ELEVATE Program (under the Energy Transformation Initiative works to ensure that the country's electric grid becomes both sustainable and equitable.
    - Energy technologies, algorithms, market designs and policies that define the electrical system in the context of increased penetration of intermittent and decentralized renewable energy generation and focus on the subsequent impacts on total system costs and social equity.
    - Market mechanisms, grid algorithms, generation and storage integration for distributed solar PV and large-scale offshore wind energy minimizes system costs and promotes equity.
- Sustainable fuels and energy storage technologies: from the chemical design of nanomaterials, molecular dyes & catalysts, to materials fabrication and device engineering for solar energy capture, carbon dioxide conversion, hydrogen combustion and electrochemical energy storage.

Breakout group 3: Sustainable Transportation

Asset and infrastructure management; micromobility and flexible transit; disruptive technologies; social sustainability (via a safe and equitable system), zero-emission vehicles and alternative fuels

- Social sustainability of transportation
- Micromobility and flexible transit
- Zero-emission vehicles and alternative fuels
- Asset and infrastructure management
    - Brack Structural Testing Facility
    - LIDAR technology and development of appropriate methodologies for cost-efficient asset management.

Breakout group 4: Food Security

Sustainable Agriculture, Food Systems & Security

- utilize carbon capturing techniques, precision agriculture, no-till systems, integrated cover cropping, biodiversity, nanotechnology, and biomass recycling.
- Convert food waste streams, develop products from underutilized foods, develop alternative and plant-based proteins as animal protein replacements

- Sustainable Fisheries
  - Aquatic food production opportunities through shellfish, seaweed, and fish.
  - Low cost distributed meshed sensor networks for coastal water quality
  - Incorporate shellfish production into water remediation with conservation benefits.
  - Increase processing capacity to ensure less food waste.

Register here: https://www.eventbrite.com/e/sustainable-coastal-communities-energy-and-transportation-tickets-129900224067