EPA RESEARCH INTO INTEGRATED RESOURCE MANAGEMENT FOR MUNICIPAL SERVICES

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US EPA Region 1
Energy and Climate Unit
Boston, MA – January 25, 2016

FOURTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

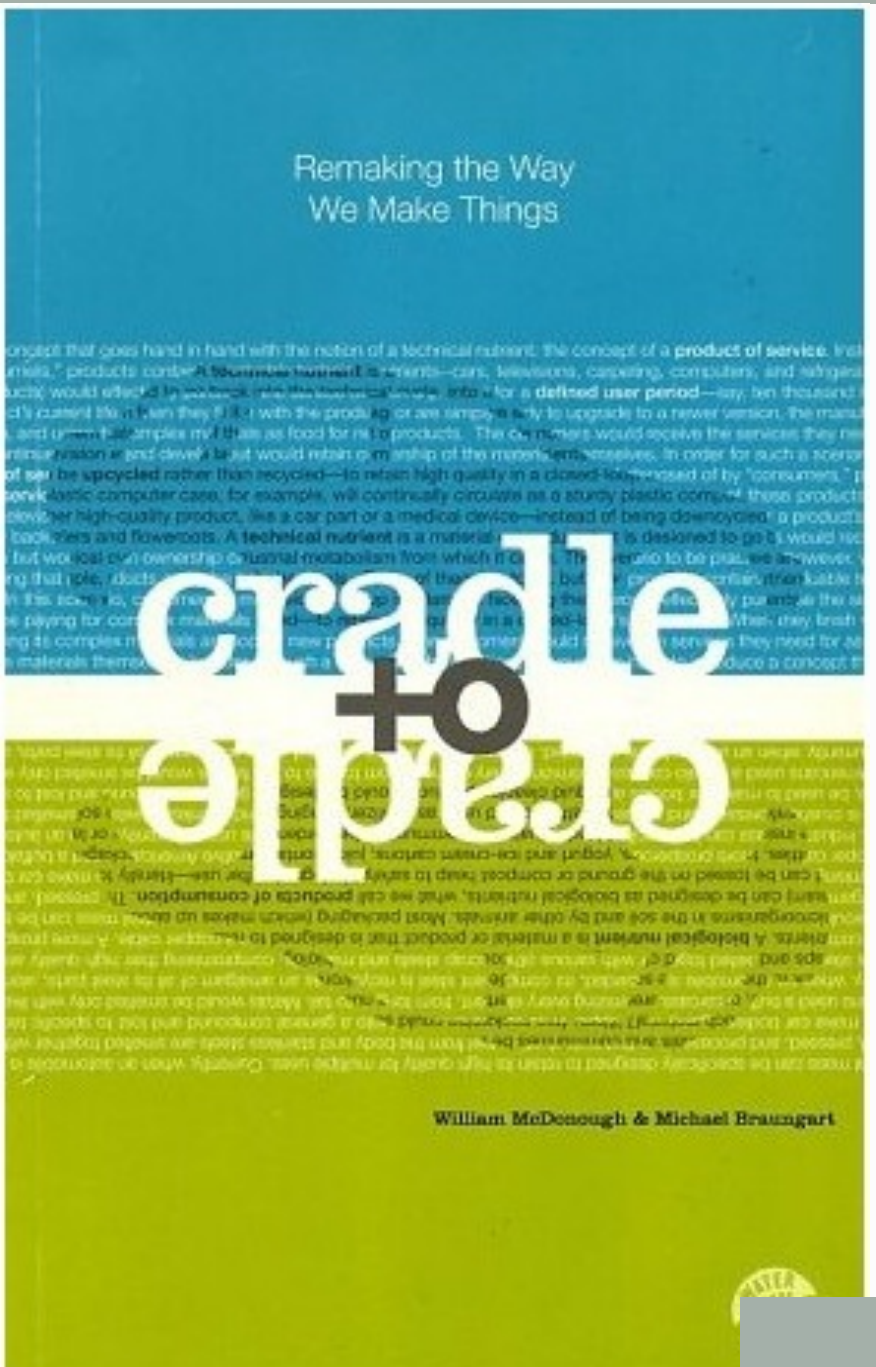
OF

MASSACHUSETTS.

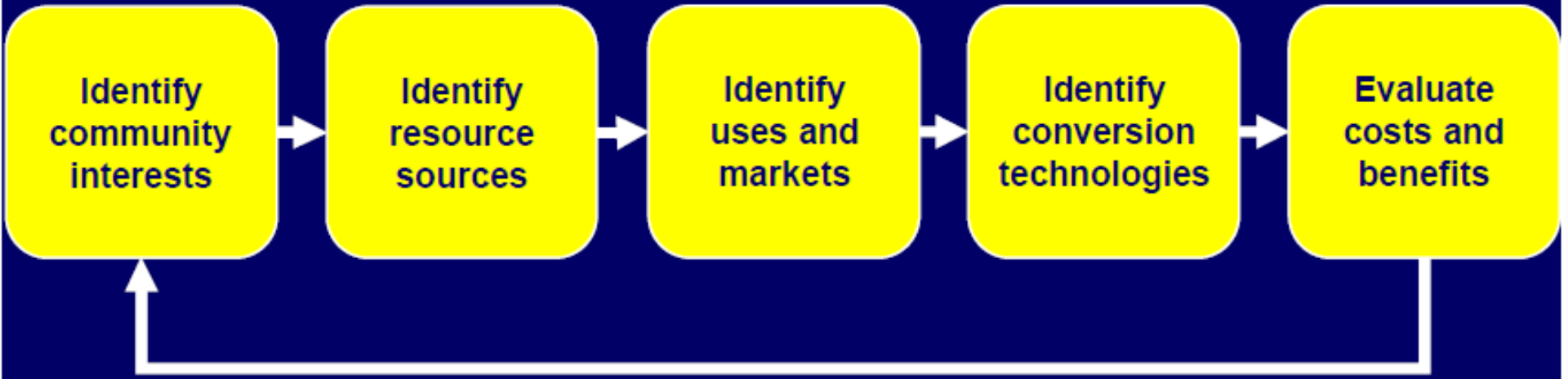
JANUARY, 1873.

We must never despair of success in the search for the means of converting our waste into useful and harmless products, however great may be the difficulties in the way.

Waste Is a Resource Out Of Place



Integrated Resource Management Process



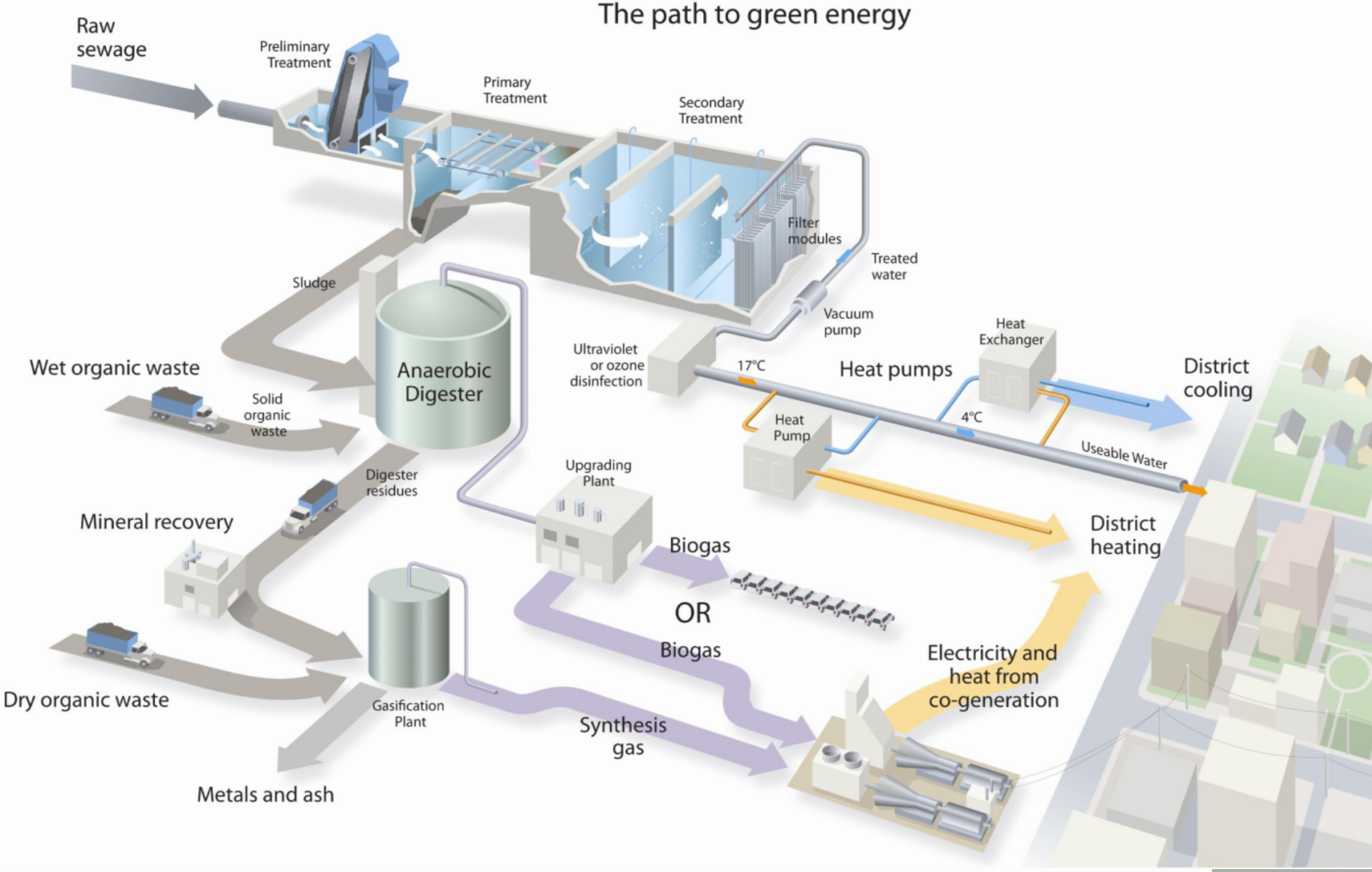
Courtesy of: Farallon Consultants, Ltd.

PEOPLE first

TECHNOLOGY last

INTEGRATED RESOURCE RECOVERY

The path to green energy



Courtesy of: Jodi Dong, British Columbia Ministry of Community, Sport, and Cultural Development

INTRODUCTION TO

WATER RESOURCE RECOVERY FACILITY DESIGN

Second Edition

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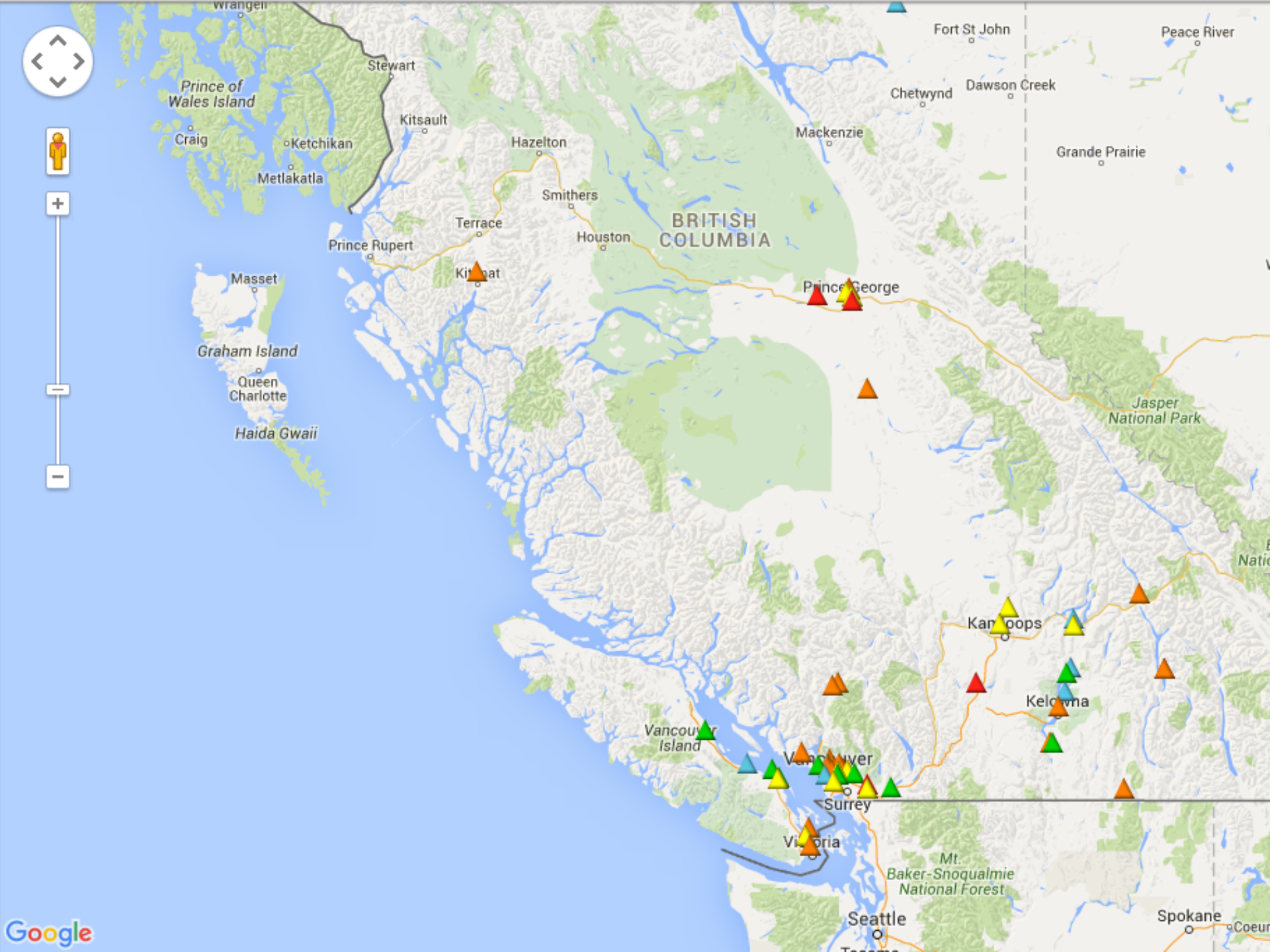

Fort St John
Peace River
Chetwynd
Dawson Creek
Mackenzie
Grande Prairie
Stewart
Prince of Wales Island
Kitsault
Craig
Ketchikan
Metlakatla
Hazelton
Smithers
Terrace
Houston
BRITISH COLUMBIA
Prince Rupert
Masset
Prince George
Graham Island
Queen Charlotte
Haida Gwaii
Jasper National Park
Kamloops
Kelowna
Vancouver Island
Surrey
Mt. Baker-Snoqualmie National Forest
Seattle
Spokane
Google

EPA Research:
Integrated Resource Management
New Bedford, MA

Project Basics

- Collaborative: Joint project of EPA (Region 1 Offices of Environmental Stewardship and Ecosystem Protection, Office of Research and Development, Office of Water/Office of Science and Technology), City of New Bedford, and Greater New Bedford Regional Refuse Management District
  - EPA contractor: Industrial Economics with Regenesis Group
  - New Bedford contractor: CDM Smith

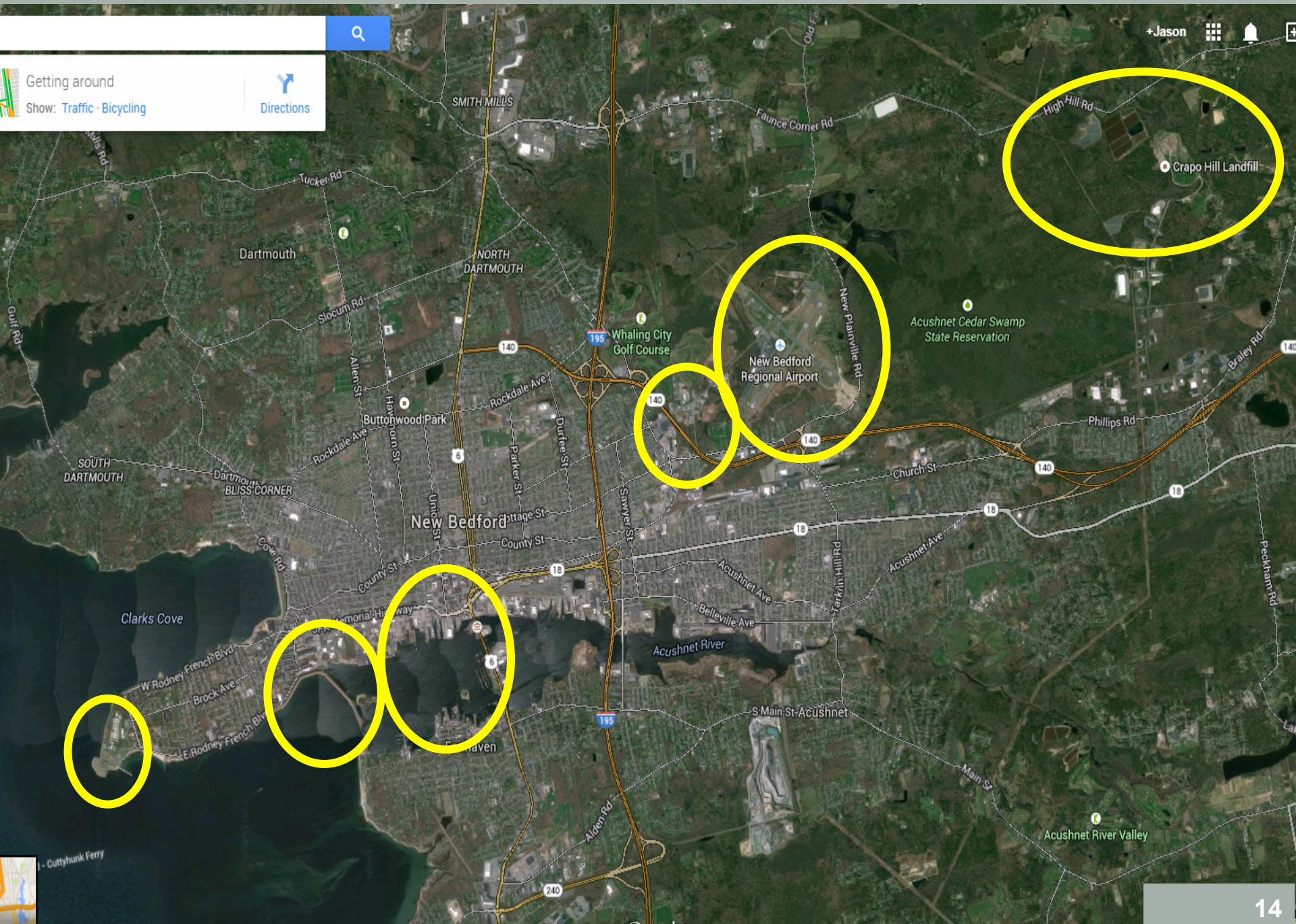
- **Goal: To examine IRM as a concept and produce the first published literature on its efficacy while also helping New Bedford manage complex issues surrounding biosolids, solid waste, clean energy, and water quality**

Project Structure

- Project Preparation:
  - Selection of a case study site
- Initial Discovery Phase:
  - Preliminary stakeholder identification and interviews
  - Preliminary data collection
  - Social network analysis

Completed

- IRM Research Phase:
  - Scenario development
  - Conduct high-level cost benefit assessment
  - Extended research on elements that are required for a successful IRM project by analyzing real-world examples


Getting around
Show: Traffic · Bicycling
Directions
+Jason
SMITH MILLS
Faunce Corner Rd
High Hill Rd
Crapo Hill Landfill
Tucker Rd
Dartmouth
NORTH DARTMOUTH
Slocum Rd
Gulf Rd
Whaling City Golf Course
New Bedford Regional Airport
New Plainville Rd
Acushnet Cedar Swamp State Reservation
Braley Rd
Buttonwood Park
Rockdale Ave
Allen St
Hawthorn St
Parker St
Durfee St
Sawyer St
Union St
Phillips Rd
Church St
SOUTH DARTMOUTH
BLISS CORNER
New Bedford
County St
Cove Rd
Clarks Cove
Acushnet Ave
Belleville Ave
Tarkiln Hill Rd
Peckham Rd
Acushnet River
W Rodney French Blvd
Brock Ave
E Rodney French Blvd
S Main St-Acushnet
Alden Rd
Main St
Acushnet River Valley
- Cuttyhunk Ferry

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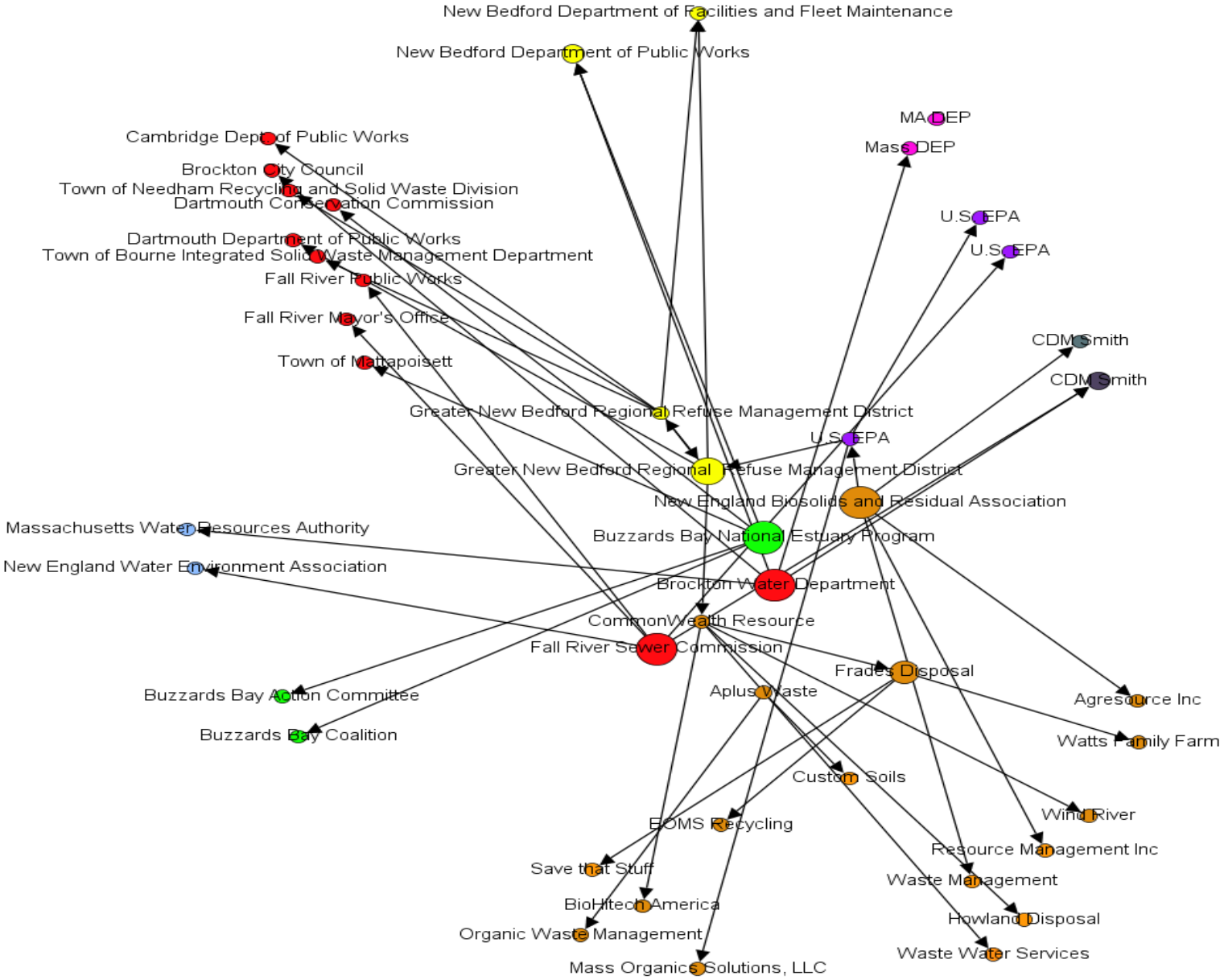
Social Network Analysis



Phase 2: Stakeholder Concerns

- Extending Landfill Life
- Public Health
- Odor Control
- Long-term biosolids solution
- FOG Management
- Collection System infrastructure
- Creation of Local Jobs
- City Role as Green Leader
- Nutrient (N and P) issues in Buzzards Bay
- Greenhouse gas mitigation
- Climate Change Resiliency
- Green Vehicle Fuels
- Non-point source pollution
- New Bedford's status as a green leader
- CSO's at treatment plant
- Protecting local fishing industry
- Treating fish industry byproducts
- Connecting to markets by rail transit
- Producing green vehicle fuels
- Creating local jobs
- Reducing landfill organics
- Improving regional air quality
- Creating markets for products (fertilizer, etc.)
- Having an informed community

Phase 2: Data / Findings

- Limited sources of high-quality, non-biosolids organic waste
  - No readily available fish waste looking for a home
  - Not as much readily available food waste as assumed
  - All of Southern New England is thinking about anaerobic digesters and organics diversion and landfill space.
- Biosolids remain a regional (Southeast MA) challenge
- Nutrients (e.g., nitrogen) are critical regional issue
- Design challenge: long-term infrastructure decisions in a dynamic, fast-changing business environment
- Process challenge: key regional stakeholders who can “activate” solutions to waste issues are not yet coordinating
  - Begin IRM process of stakeholder integrations as early as possible
  - Important to make sure all team members understand the basic concepts up front
  - Need a willing partner / internal champion

Phase 3: Scenario Building and Analysis

- Domain experts (civil, architecture, landscape architects, cost estimation, energy) work on iterative ideas
  - High-level analysis, examining only limited scenarios put forward by city
- Measure the cost/benefit of endpoints not traditionally considered (GHG impacts, job impacts, health impacts, etc.) vs business-as-usual (incineration). Examples for one anaerobic digestion scenario:
  - New jobs in New Bedford could produce $5.4 million to $10.8 million in economic impacts depending on the technology selected
  - New technologies for sludge management avoid 4,046 to 34,819 metrics tons of CO2e (value of $161,843.71 to $1,392,770.51)
  - New technologies for sludge management avoid 5.74 to 30.23 metric tons of SO2 (value of $200,741.69 to $1,058,142.29)
- Publish results: see you in 1-2 years!

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