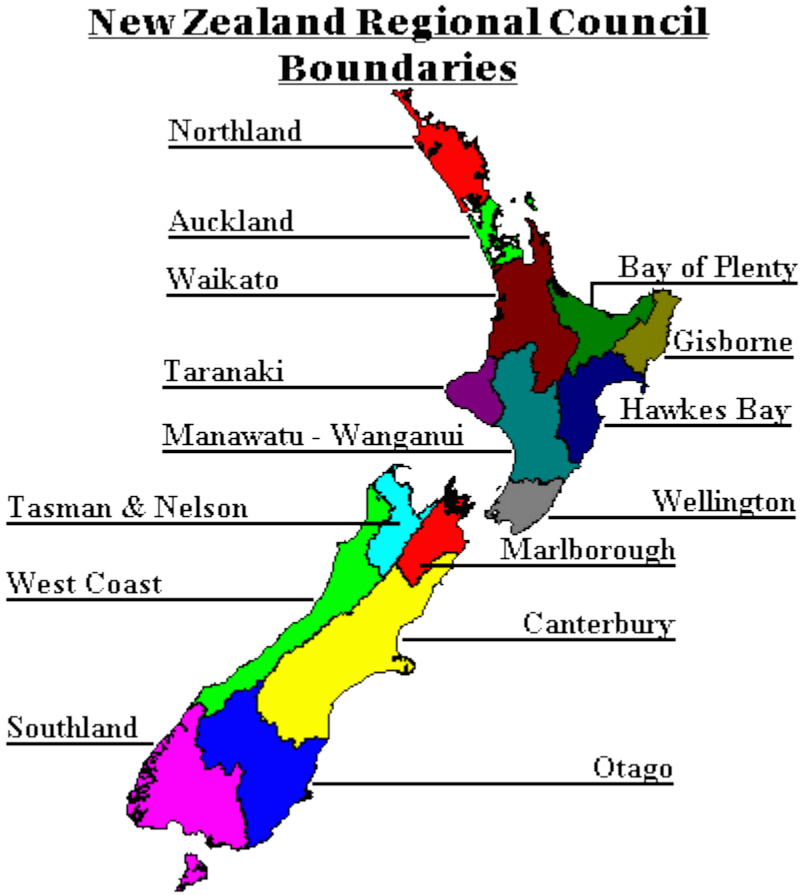
ENVIRONMENTAL CONSENTS HOW WE MIGHT IMPROVE THEM IN NEW ZEALAND

GARRY MACDONALD (PRINCIPAL/TECHNICAL DIRECTOR - BECA LIMITED)

National Context

- National Legislation
  - RMA Changes
  - NPS Freshwater Management (NPS-FM)
  - Urban Development Authorities
  - Zero Carbon Bill
- Political Climate
  - Land and Water Forum Recommendations
  - 3 Waters Review
  - Increased public concern and awareness – political drivers
- Other Drivers
  - Climate Change
  - Tourism – “Clean Blue-Green Image”



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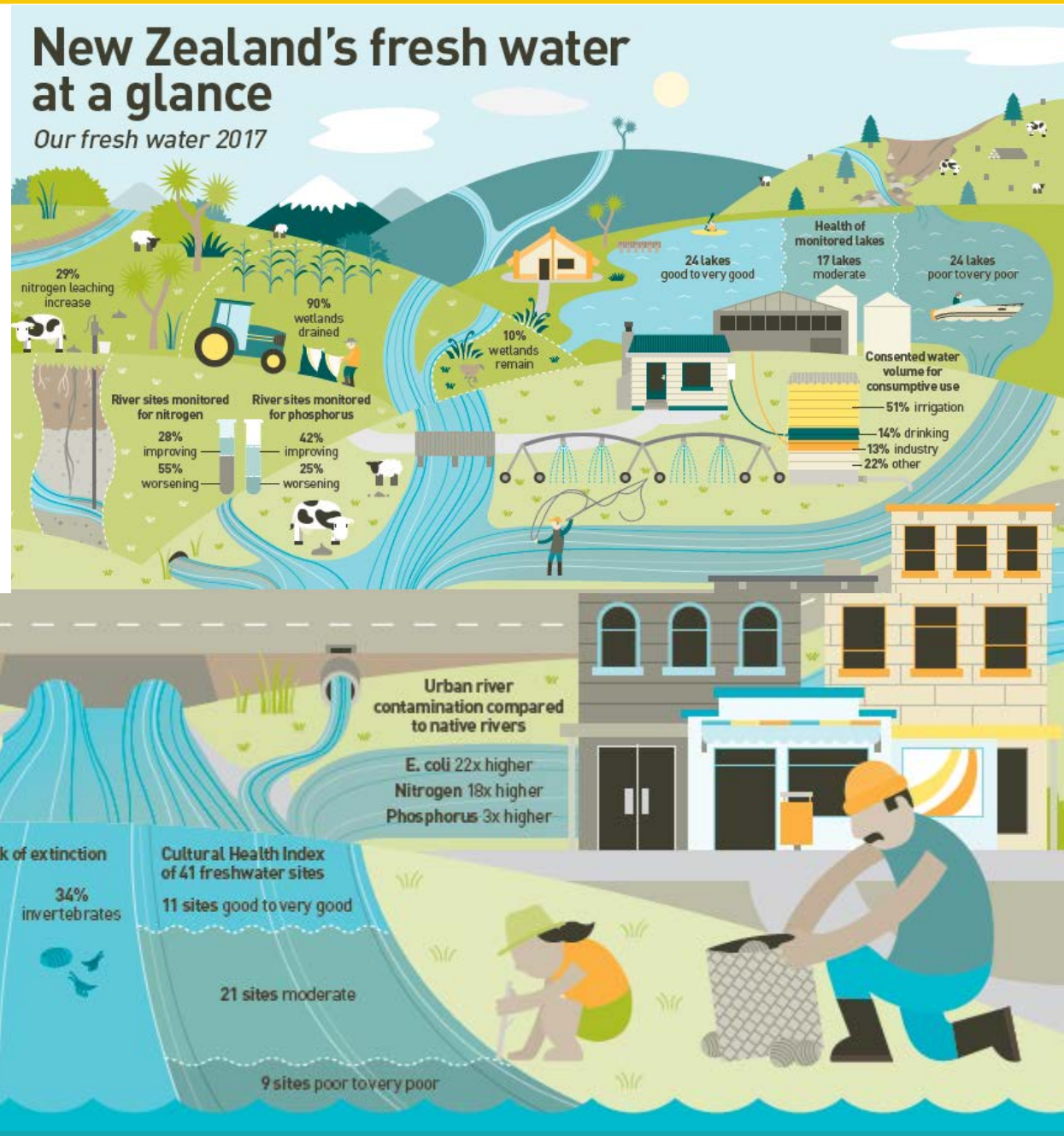


Political Climate

- Political Climate
  - Land and Water Forum Recommendations
  - 3 Waters Review
  - Increased public concern and awareness
  - Coalition political drivers (Greens)
- LAWF Recommendations
  - *The urgent need for identification of "at risk" catchments and the requirement for effective action plans to avoid further deterioration;*
  - *The better management of sediments by expanding and improving erosion and sediment control programmes already underway;*
  - *The establishment under the NPS-FM of catchment limits for water quality, in particular nutrients and with a focus on nitrogen.*
- "Good Management Practices" (GMPs) – what are these for urban catchments?

Other Drivers

- Other Drivers
  - Climate Change
  - Tourism
  - “Clean Blue-Green Image”
  - Public sentiment

Standardised Environmental Monitoring

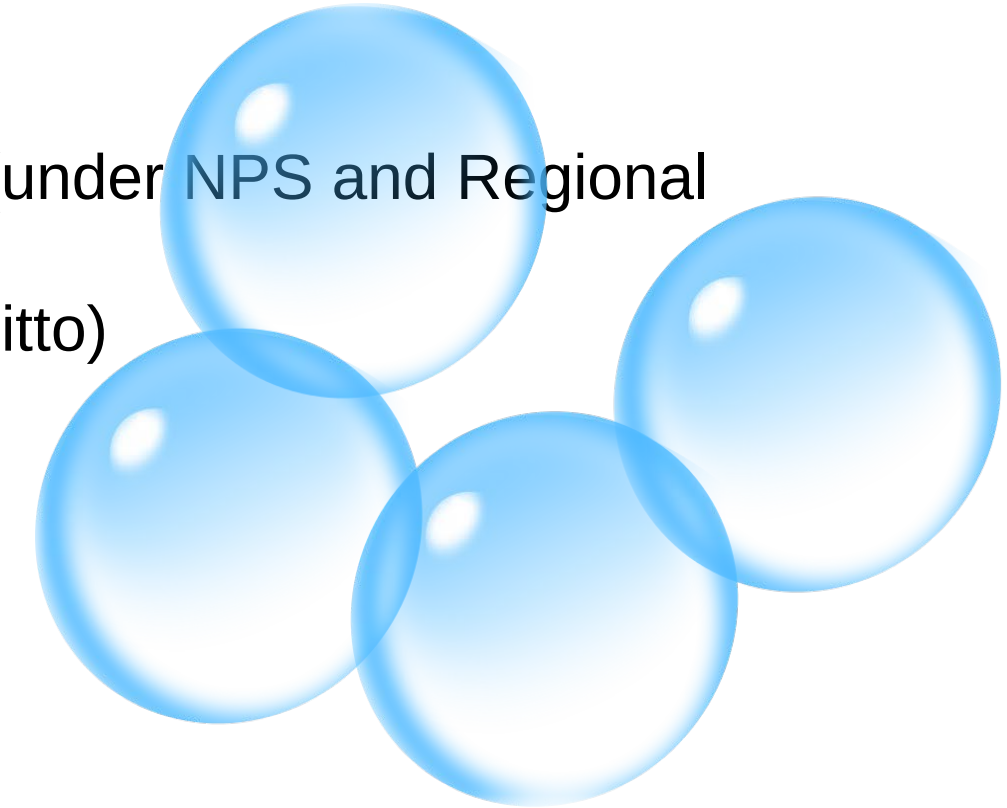
- LAWF and NPS-FM has signalled most important contaminants
  - Concerted national effort to quantify current spatial and temporal variations in receiving waters
  - Should not be restricted to freshwater – coastal waters and estuaries just as important
- Point discharges to also be targeted
  - Consent conditions review – either on expiry or “on review”
  - Standardised format on a common national digital platform
  - Use remote sensors, the Cloud/IoT
- Objectives
  - Greater understanding of catchment-wide spatial and temporal variations in water quality
  - Higher quality data that really matters – “not measuring for the sake of it”
  - Accuracy, visibility, credibility, defensibility

LAWF Recommendations – “Just do it”

- Get ahead of the changes
  - *Develop standardised monitoring methodologies for urban waterways and establish (national) protocols for data capture, storage and sharing*
  - *Develop frameworks to guide the design and operation of remote sensors on stormwater and wastewater networks;*
  - *Specify methods for event-based sampling of water quality to capture the effects of intermittent and short-duration causes of poor water quality in urban environments (e.g. high intensity short duration rain events with wastewater overflows);*
  - *Develop frameworks to guide the design and operation of models to complement event-based sampling and longitudinal monitoring and enable forecasting of risk (to the quality of the water body*

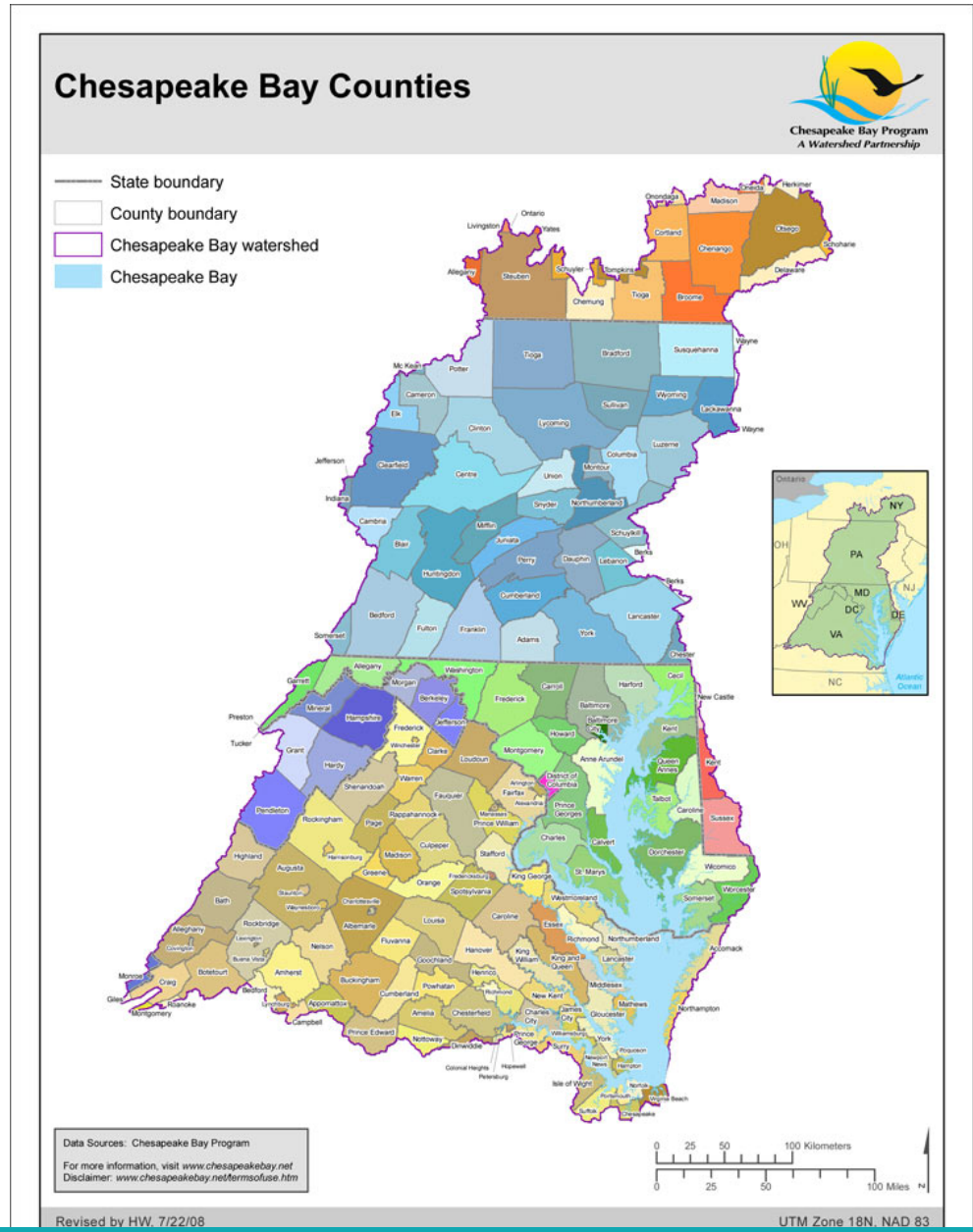
Cumulative Effects – “Bubble” or “Balloon” Consents

- Drivers
  - Nutrient allocations to freshwater bodies (under NPS and Regional Plans)
  - Suspended solids/sediment allocations (ditto)
- Benefits
  - Heathier ecosytems
  - Water clarity
- Response
  - TMDL (total maximum daily load) regime
  - Split between point and non-point sources

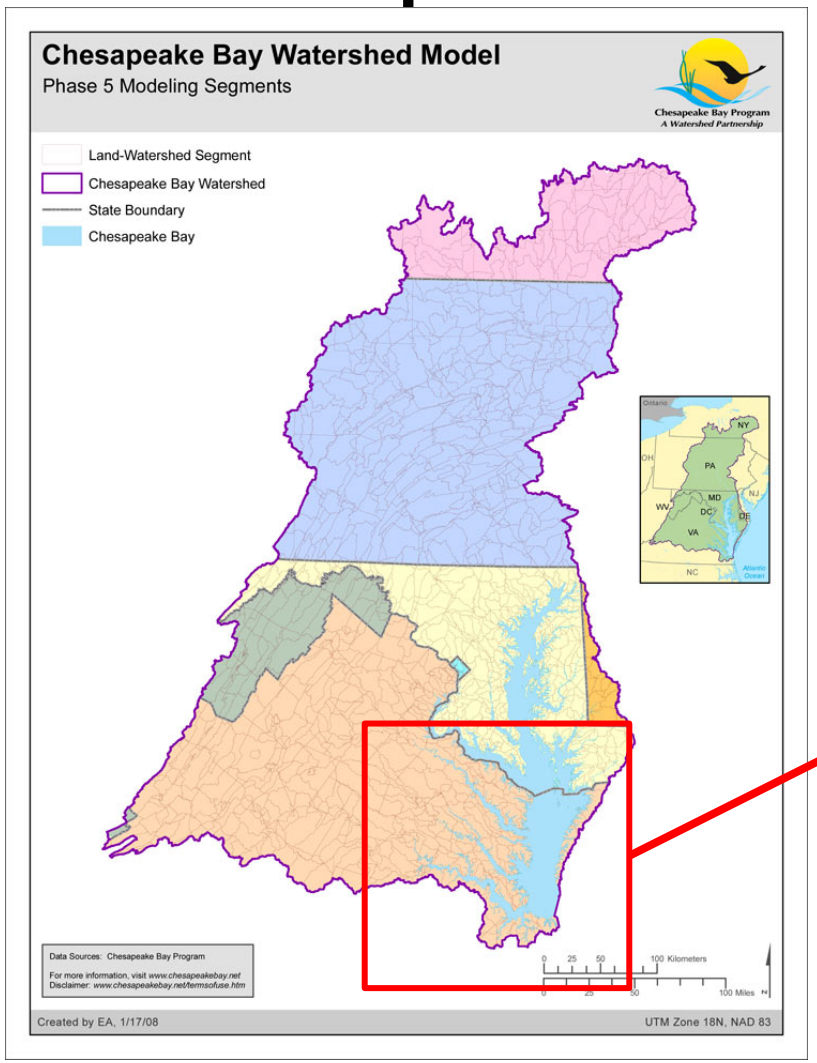


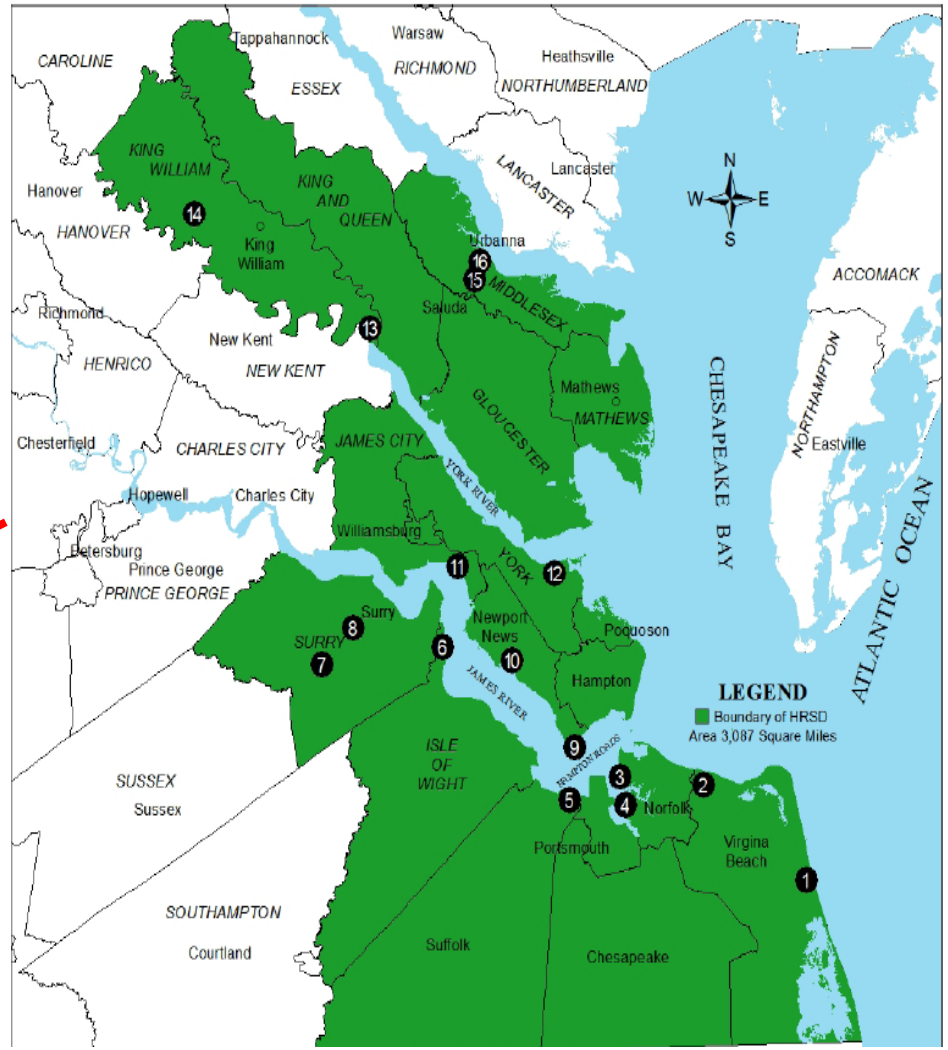
Chesapeake Bay, VA

- EPA established TMDL for the whole Bay – December 2010
  - 16.5million ha (64,000 sq.mile) watershed
  - Actually 92 smaller TMDLs for individual sub-catchments and water bodies
  - Indicators used - DO, water clarity, ecosystems, cha chloraphyll a
  - Limits on Nitrogen (25% reduction), Phosphorus (24%) and sediment (20%)



Hampton Roads Sanitation District (HRSD)

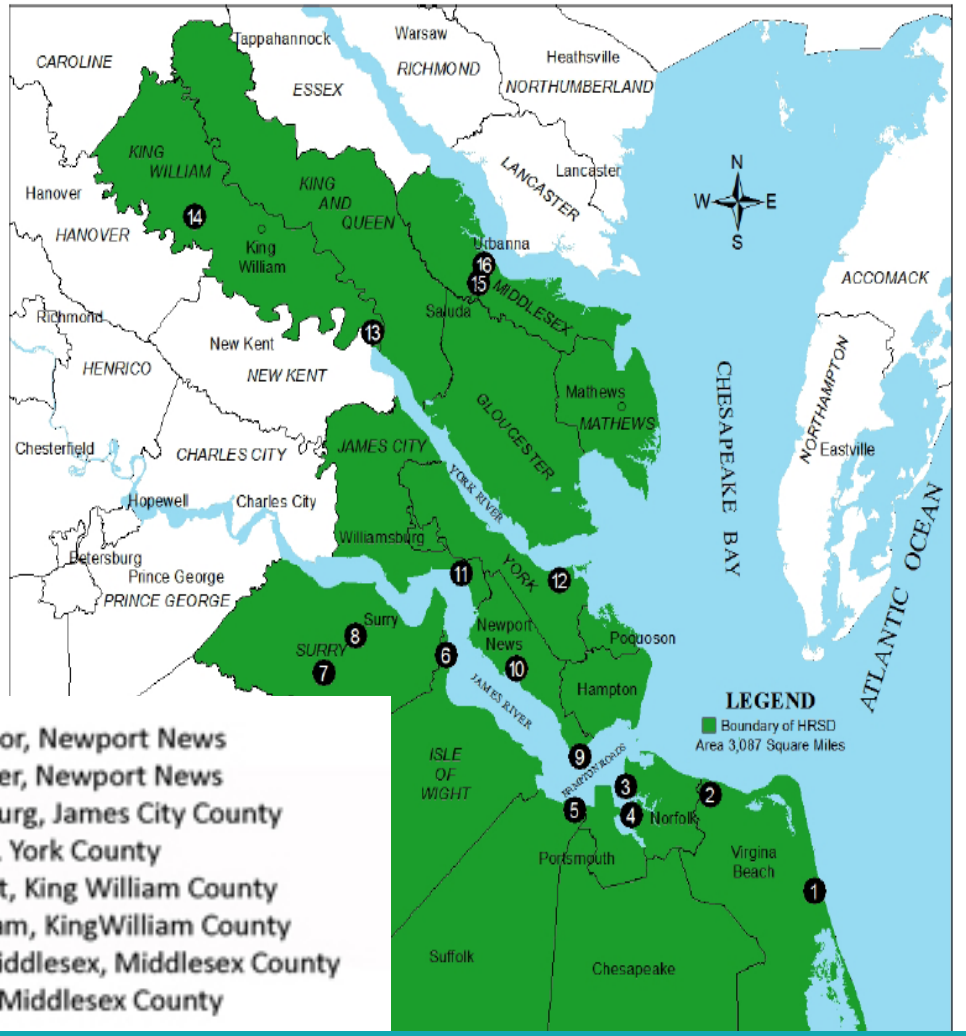




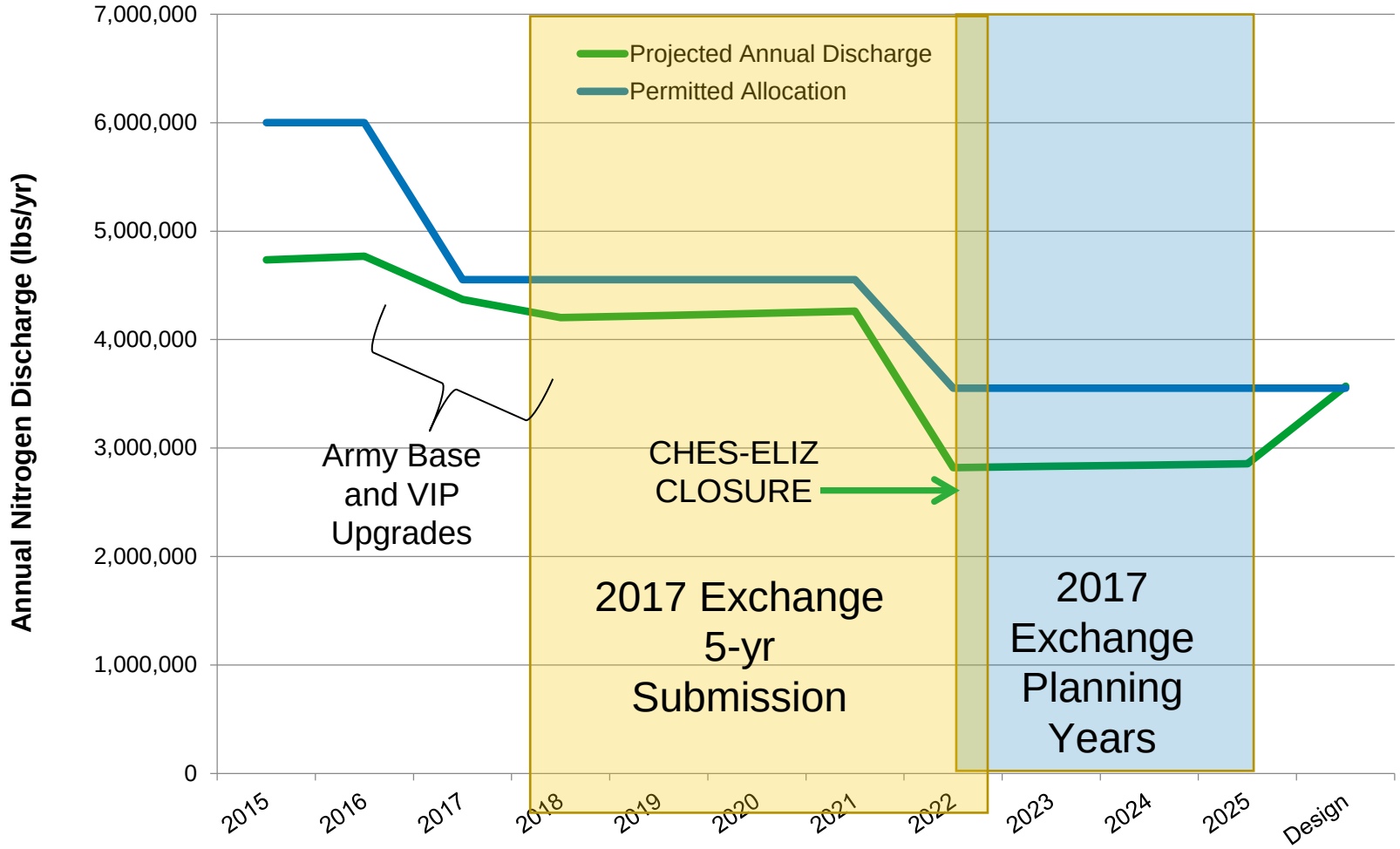
Hampton Roads Sanitation District, VA

- Statistics
  - 1.7 million people
  - 18 counties and cities
  - 9 major and 4 smaller WWTPs
  - Total discharge = 950,000 cu.m/day

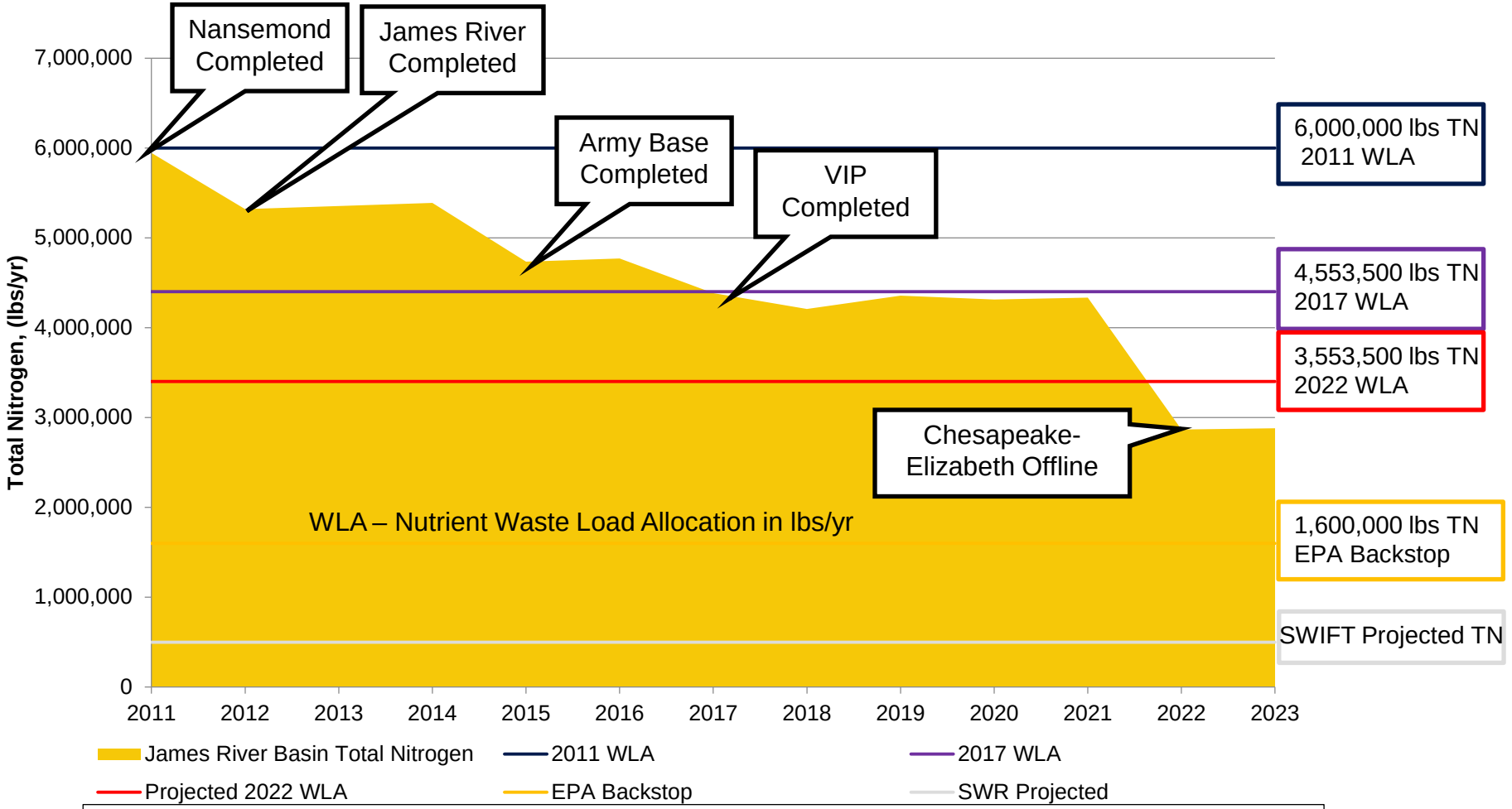
1. Atlantic, Virginia Beach
2. Chesapeake-Elizabeth, Va. Beach
3. Army Base, Norfolk
4. Virginia Initiative, Norfolk
5. Nansemond, Suffolk
6. Lawnes Point, Smithfield
7. County of Surry
8. Town of Surry
09. Boat Harbor, Newport News
10. James River, Newport News
11. Williamsburg, James City County
12. York River, York County
13. West Point, King William County
14. King William, KingWilliam County
15. Central Middlesex, Middlesex County
16. Urbanna, Middlesex County



James River Basin Nitrogen Reduction Strategy



Impact on nutrient reductions for HRSD



James River Basin – TN Similar results with TP and TSS and in other river basins.

Environmental Offsets/Trade offs

- Wiser use of capital – wider environmental benefits
  - Alternative to large capital investments in upgrading its WWTP or wastewater network
  - Water utility funds environmental enhancements in wider water catchment
- Could be by one utility or a number of utilities working together
- Scope for offsetting across all 3 Waters
- Examples:
  - Established buffer zones/riparian margins through land purchase
  - Recycled water to reduce water takes in times of drought/low river flows
  - Consolidate WWTPs on a regional basis
    - Close most sensitive or hard-to-upgrade plants
    - Transfer flows and loads

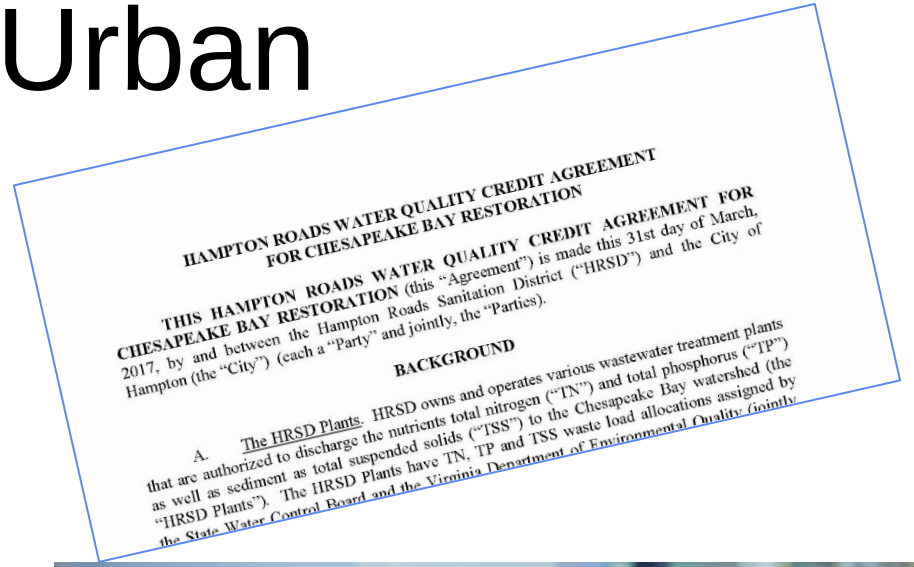
Potential to offset stormwater reductions

	Approximate total credits due to SWIFT	Regional Stormwater Reduction Needs*
Nitrogen		
James	2,900,000	63,039
York	250,000	19,114
Phosphorus		
James	250,000	13,088
York	16,000	3,887

* DEQ Regulated Stormwater w/o federal lands

Benefit – Eliminated Costly Urban Stormwater Nutrient BMPs

Executed nutrient trading agreements with 11 MS4 localities



HAMPTON ROADS WATER QUALITY CREDIT AGREEMENT
FOR CHESAPEAKE BAY RESTORATION

THIS HAMPTON ROADS WATER QUALITY CREDIT AGREEMENT FOR CHESAPEAKE BAY RESTORATION (this "Agreement") is made this 31st day of March, 2017, by and between the Hampton Roads Sanitation District ("HRSD") and the City of Hampton (the "City") (each a "Party" and jointly, the "Parties").

BACKGROUND

A. The HRSD Plants. HRSD owns and operates various wastewater treatment plants that are authorized to discharge the nutrients total nitrogen ("TN") and total phosphorus ("TP") as well as sediment as total suspended solids ("TSS") to the Chesapeake Bay watershed (the "HRSD Plants"). The HRSD Plants have TN, TP and TSS waste load allocations assigned by the State Water Control Board and the Virginia Department of Environmental Quality (jointly

Example – James River TN

- 2,900,000 lbs/yr TN credit available with SWIFT
- 63,000 lbs/yr TN removal needed for all stormwater MS4s in James River watershed

Environmental Permit and Water Trading

- Australian examples
  - Water shortage
  - Environmental flows
  - Inter-catchment and intra-catchment cost-benefits

Questions?

ENVIRONMENTAL CONSENTS
HOW WE MIGHT IMPROVE THEM IN NZ

Garry Macdonald (Beca Limited)

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everyday
better.