

# Taxonomy, Diversity and Ecology of Megafaunal Invertebrate Assemblages Associated with Gulf of Mexico Deep-Sea Coral Habitats

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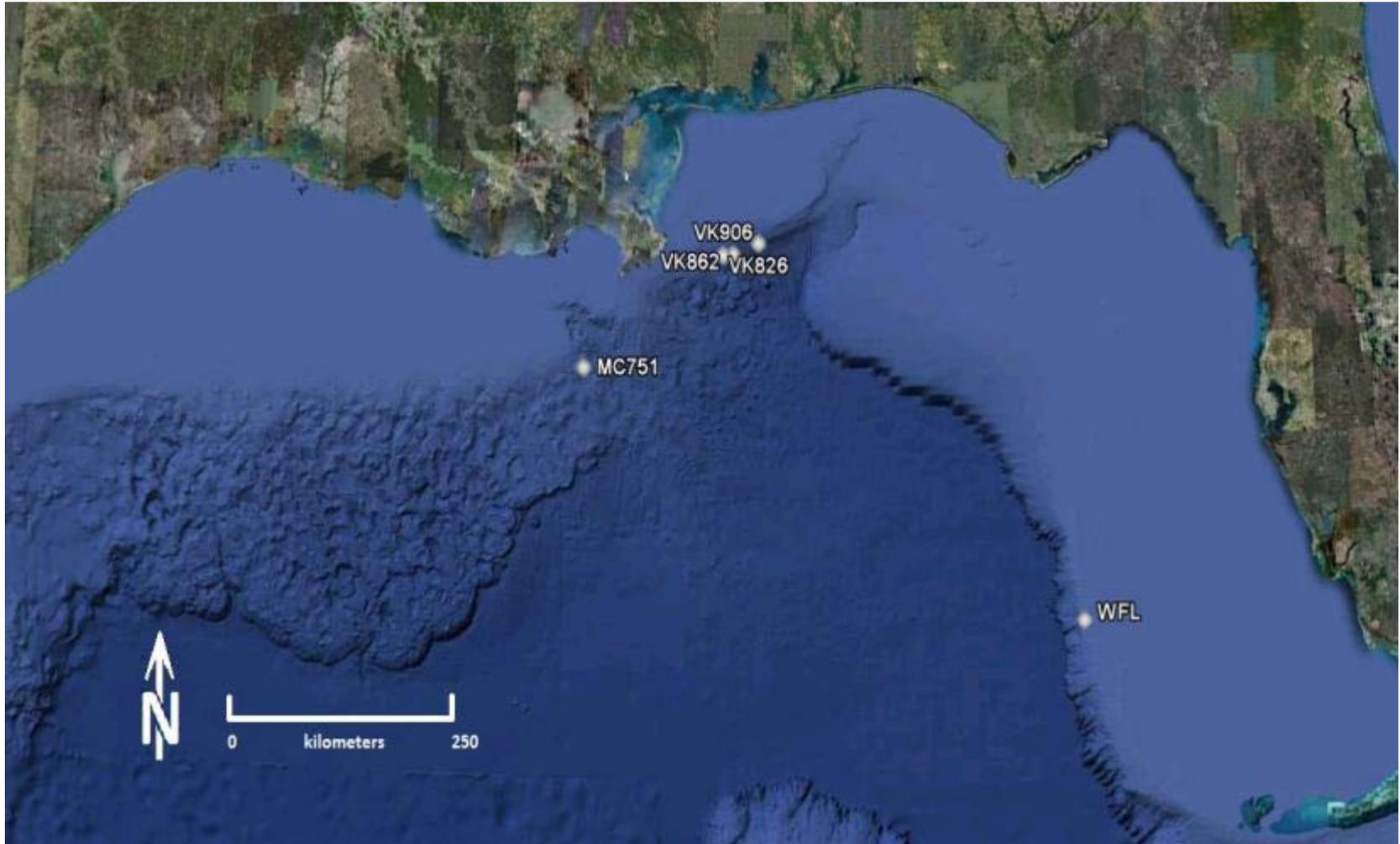
Washington, DC



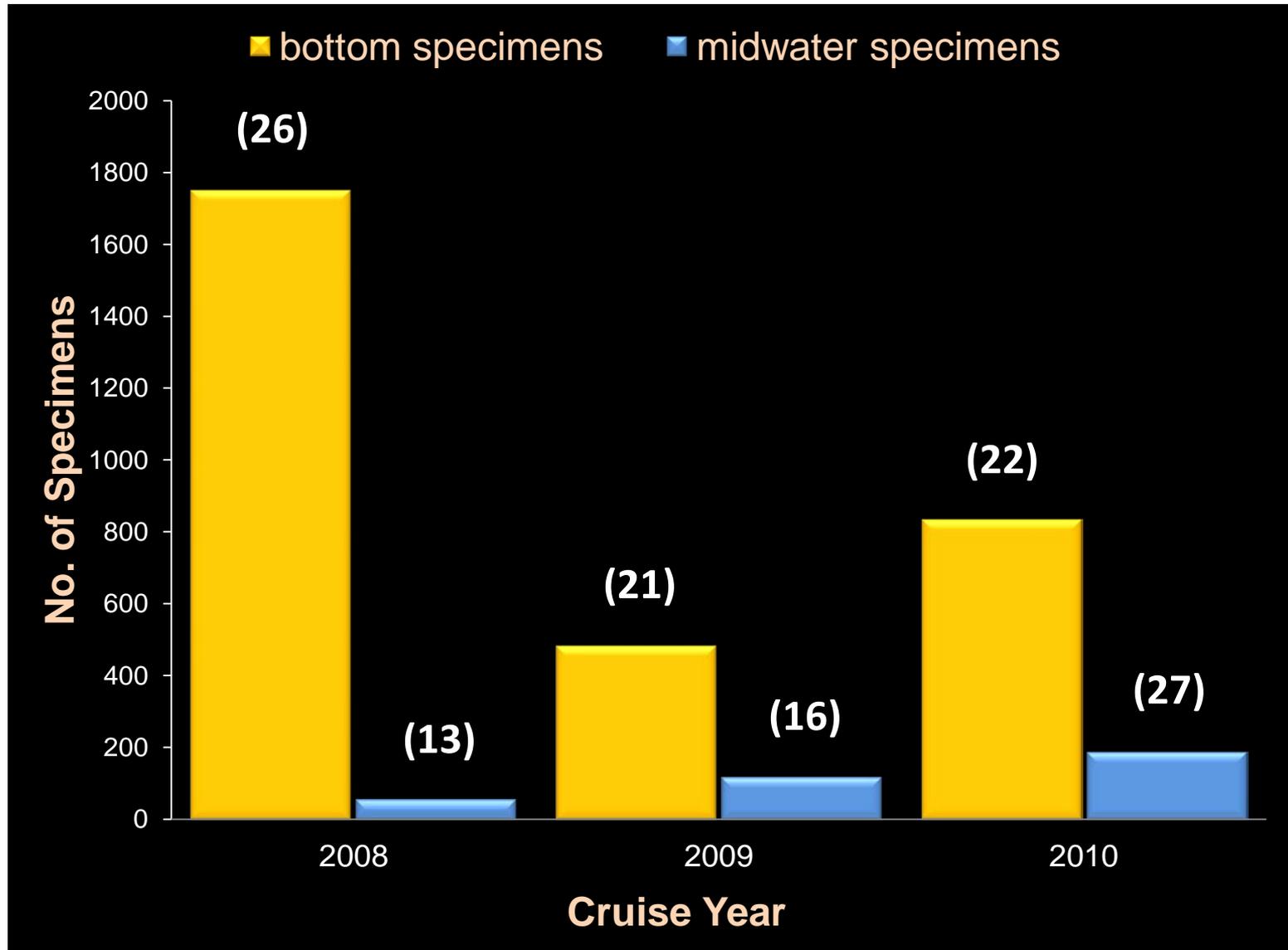
# Objectives

- Make accurate taxonomic identifications of associated megafaunal invertebrate assemblages observed on and around deep-sea coral habitats
- Assess levels of endemism at deep coral habitats
- Examine patterns of species diversity and geographic distribution of the mega-invertebrate fauna between sites; comparisons with similar habitats in other locations
- Assess community structure, basic ecology and population dynamics of the invertebrate fauna
- Examine phylogenetic and phylogeographic relationships of these species assemblages

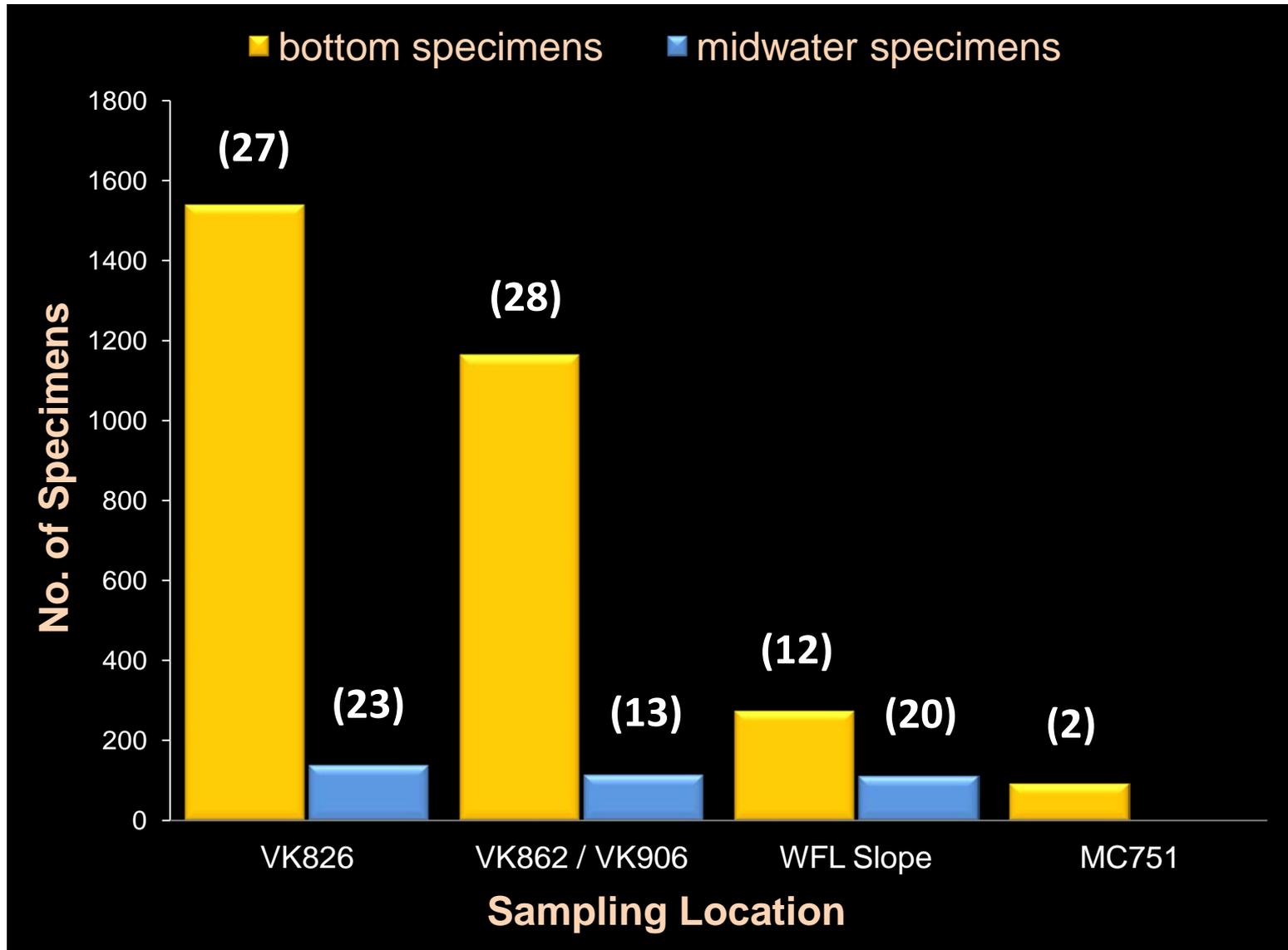
# Sampling Locations



# Specimens



# Specimens



# Taxonomy

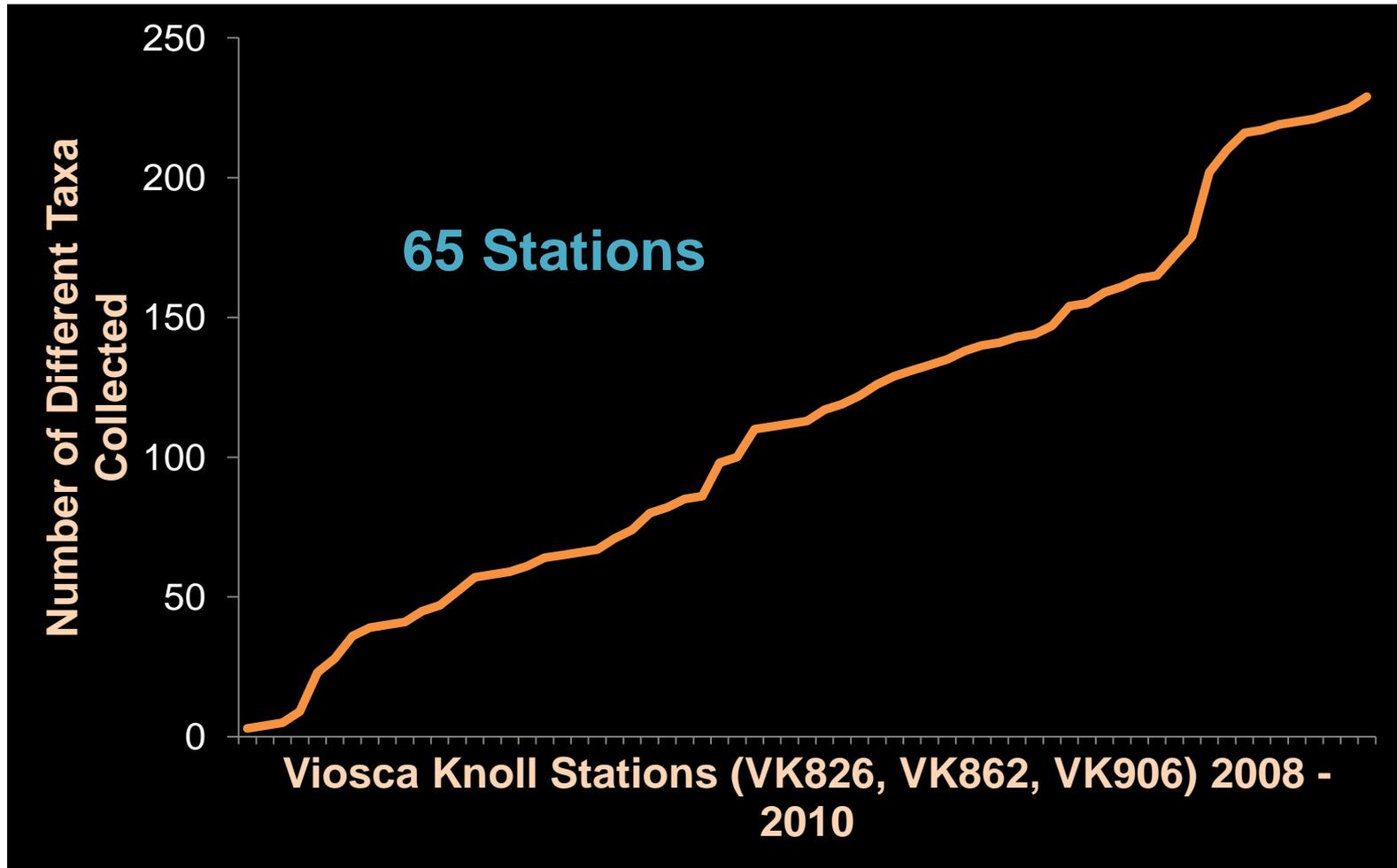
- Accurate identifications are fundamental and critical to all aspects of this investigation
- Overall, taxonomy of deep-sea invertebrates is not well known
  - Lack of taxonomic expertise in many taxa
  - Lack of taxonomic keys
  - Need for improved collaborations
- Continue to increase knowledge of invertebrate fauna associated with deep-sea coral habitats and off-reef areas

# Taxonomy (cont.)

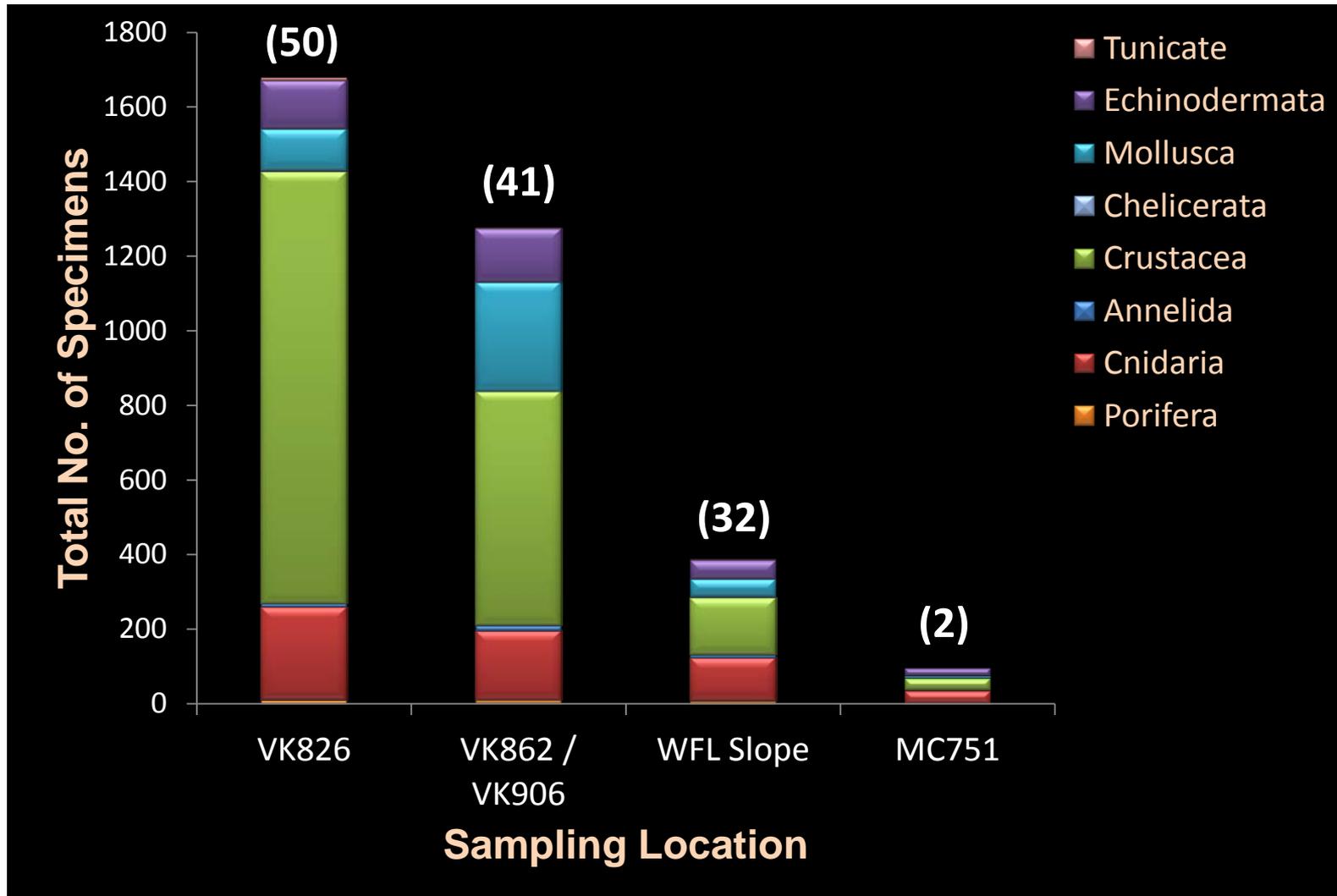
- Species new to science identified
  - At least four squat lobsters
  - One holothurian
  - One alpheid
  - More expected for various taxa
- Species re-descriptions
- Species complexes
- Endemic species few in number

# Patterns of Diversity

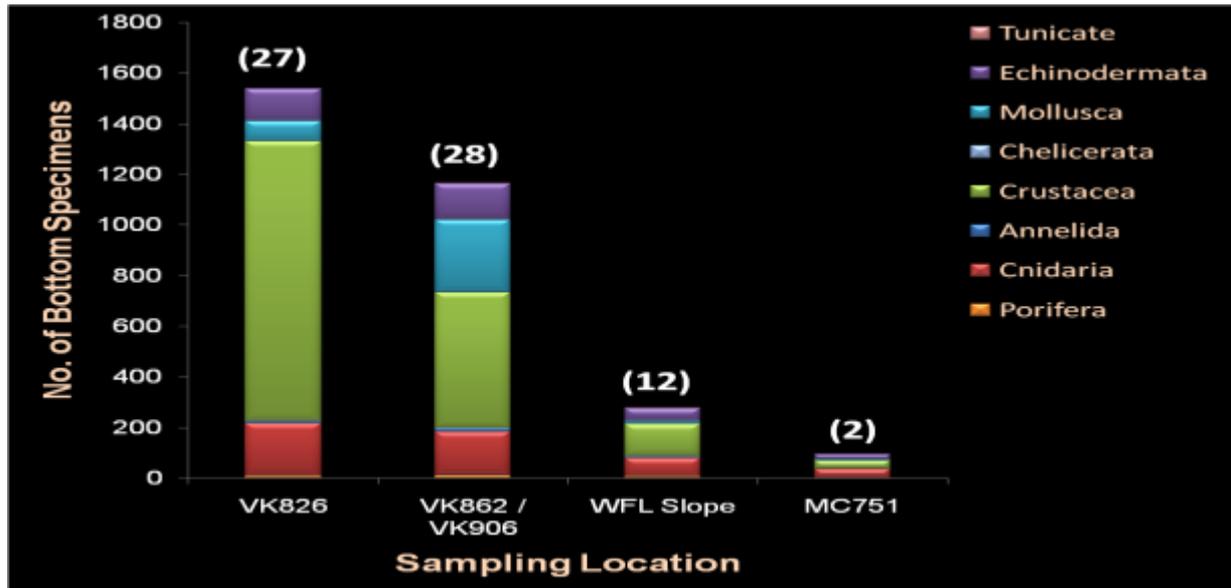
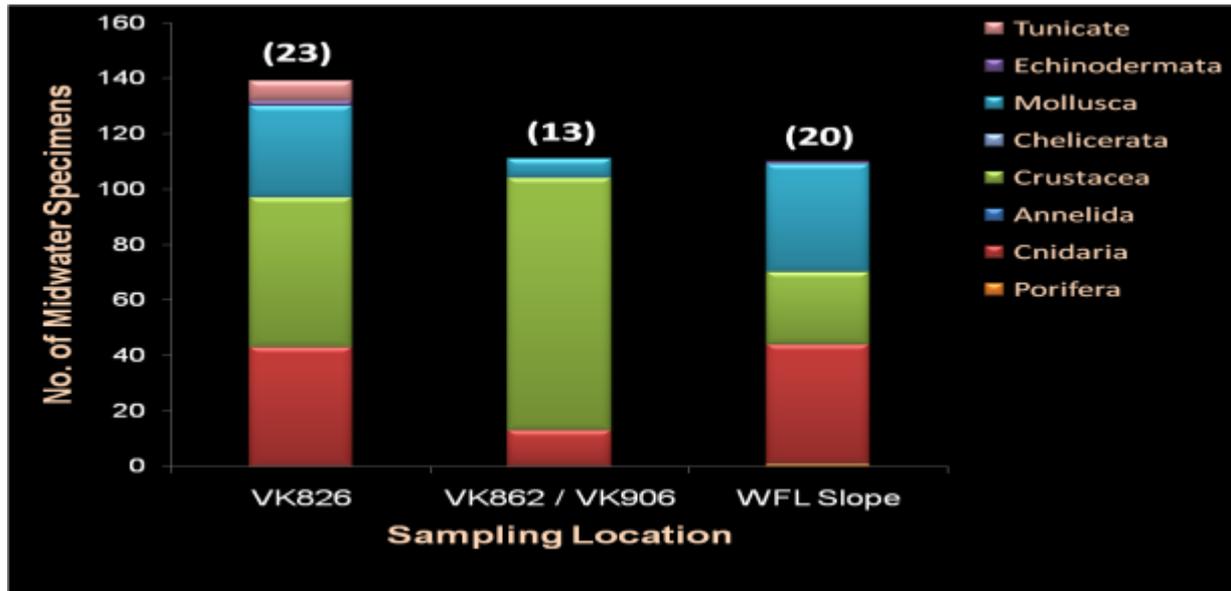
- Species Accumulation Curves
  - Overall, species accumulation curve still ascending



# Patterns of Diversity (cont.)

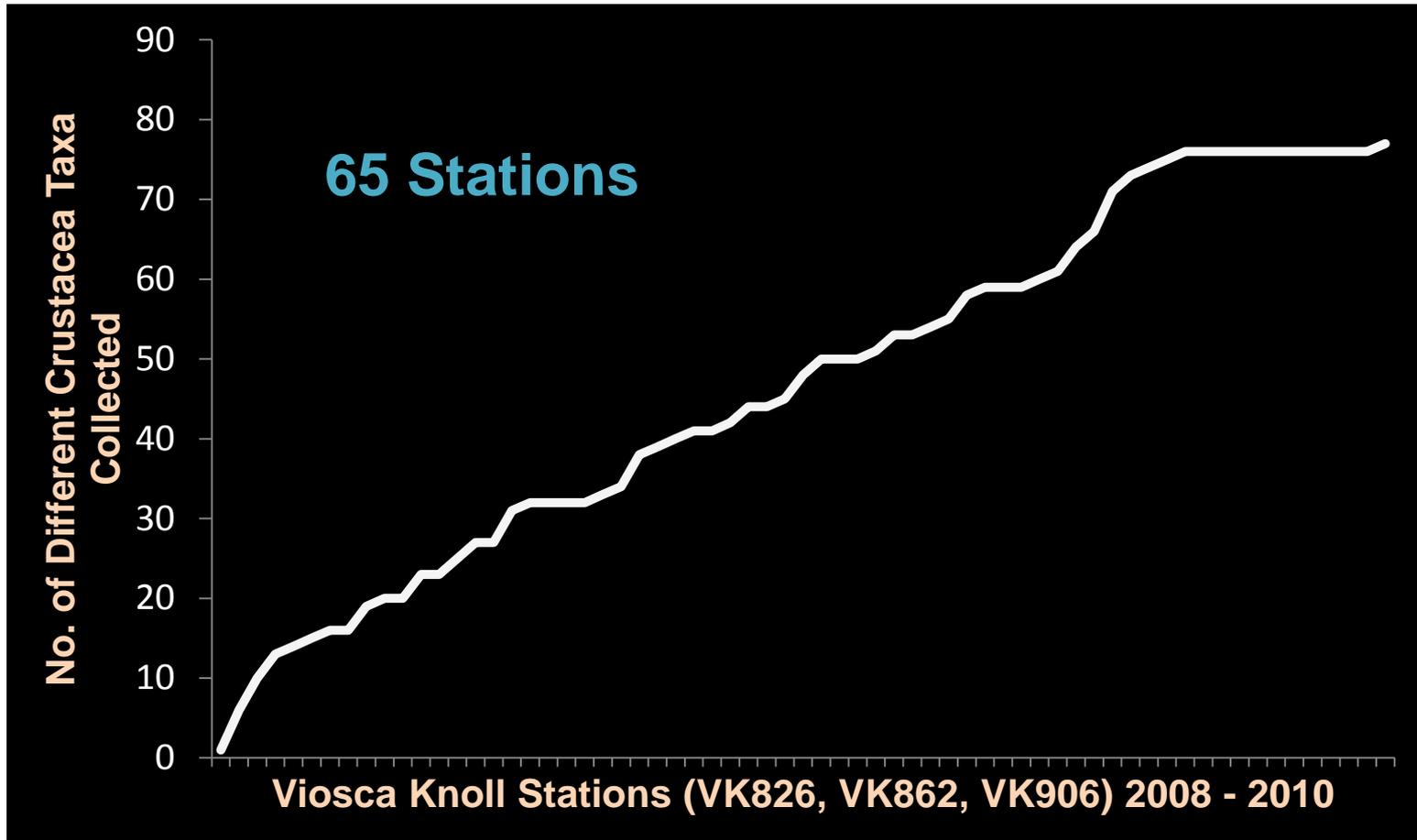


# Patterns of Diversity (cont.)



# Patterns of Diversity

- Species Accumulation Curves
  - Better understanding of Crustacean diversity



# Patterns of Diversity (cont.)

## Crustaceans

- Known diversity increasing overall
  - *Rochinia*
  - *Gastroptychus*
  - *Munida; Munidopsis*
- New records for the Gulf of Mexico
- Refining distributions for some species
  - Geographic range
  - Bathymetric range

# Patterns of Diversity (cont.)

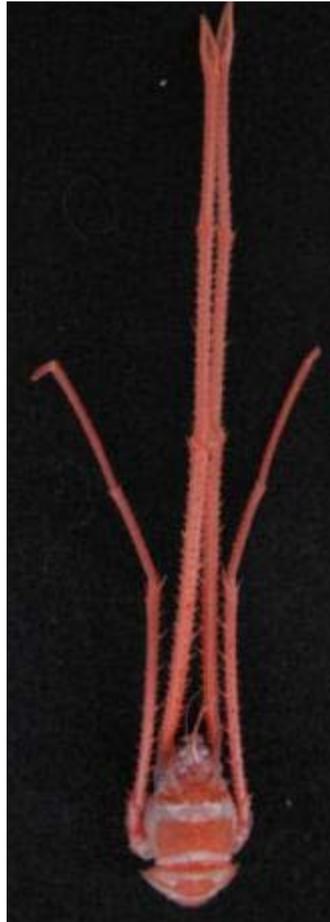
- Regional differences
  - Midwater versus Benthic
  - Viosca Knoll versus West Florida Slope
    - Higher diversity at Viosca Knoll
    - Species composition differs between locations?
    - W FL slope species have southern affinities?

# Ecology

- Large sample sizes provide data necessary to assess relative abundances and population dynamics of some species
- Species thought to be rare may actually be more common than once thought
- Species associations and habitat utilization
  - Between habitats
    - Coral versus soft substrata

# Ecology

## Coral/Rubble Habitat



# Ecology

## Off-reef/Soft Substrata



# Summary and Next Steps

- Taxonomic investigations continue
  - First step towards understanding richness, diversity, community structure
  - Identifications; species descriptions and re-descriptions
  - Refining our knowledge of biodiversity, species abundances, distributions, population dynamics
- Habitat utilization; Community structure
- Phylogenetic analyses
- Comparative phylogeography