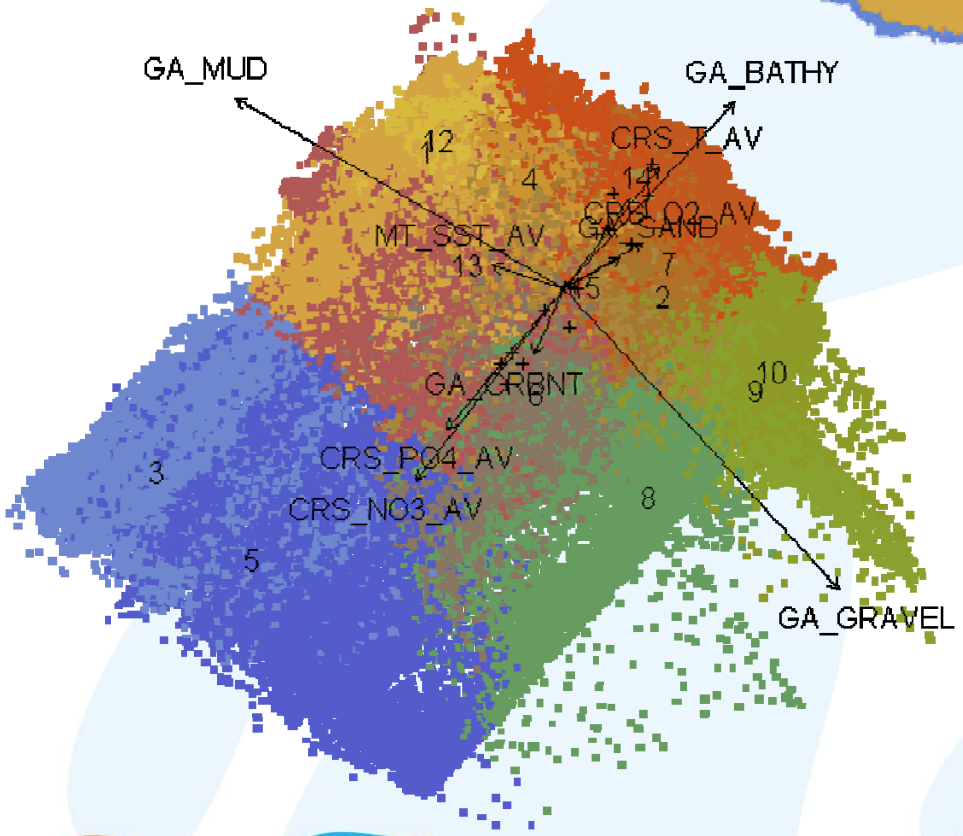
National Environmental Research Program

MARINE BIODIVERSITY hub

Landscape approaches to supporting management of marine benthic biodiversity, in the SEMR



Roland Pitcher

CSIRO

Why benthic biodiversity in the SEMR ?

- identify and integrate existing and new information and data about benthic biodiversity
- improve knowledge & understanding of benthic biodiversity distribution, protection and vulnerability
- improve knowledge & understanding of pressures on benthic biodiversity
- analyse potential impacts of uses on benthic biodiversity and how impacts may avoided or mitigated by management
- apply methods to evaluate how management strategies are effective in achieving conservation of benthic biodiversity and sustainable multiple use

SEMR benthic research team

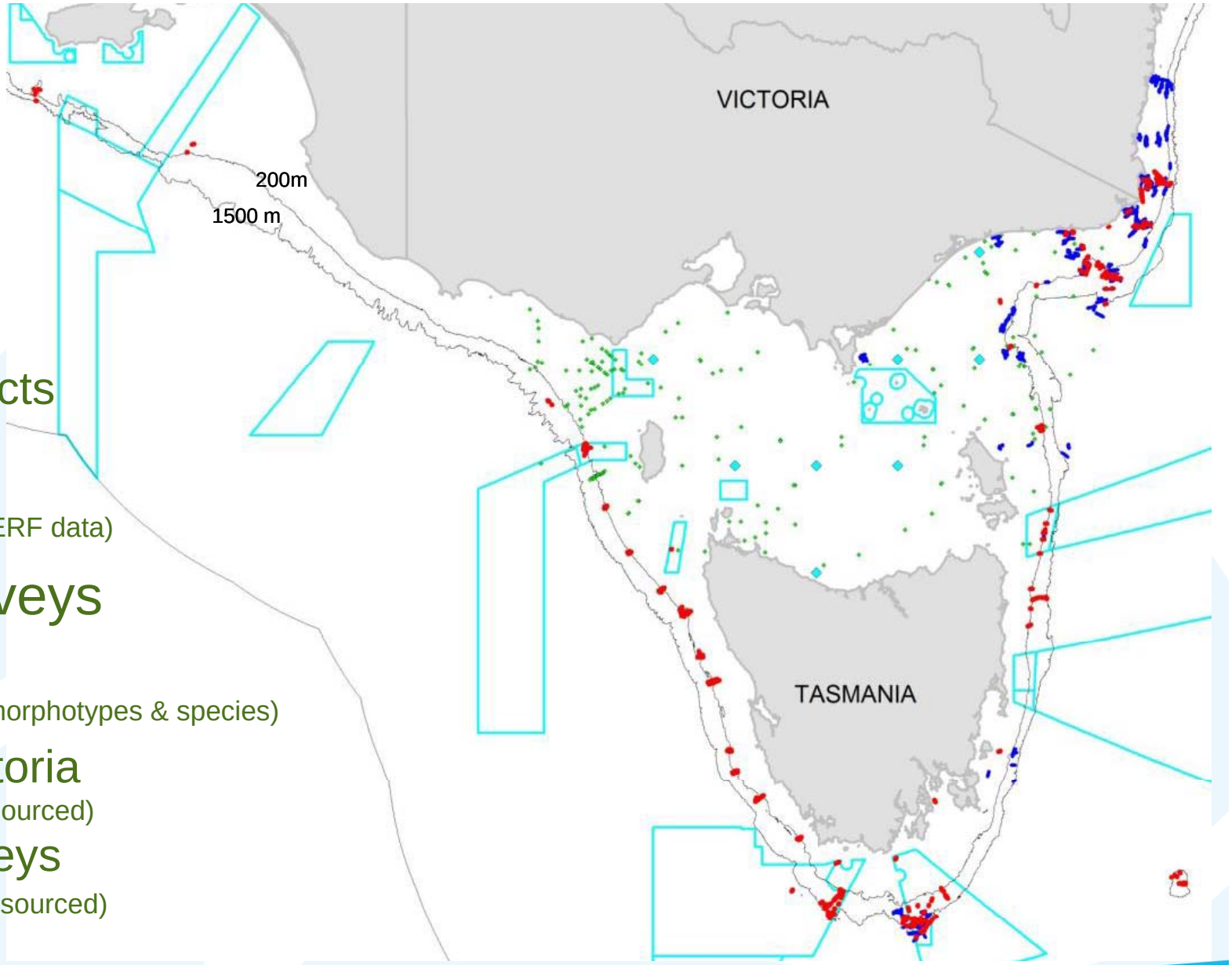
- Roland Pitcher: project leader, benthic ecologist, impact & recovery information, analysis & prediction,
- Alan Williams: co-PL, SEMR benthic biological & fishery information,
- Nick Ellis: dynamic modelling and scenario evaluation,
- Franzis Althaus: SEMR benthic biological data management, fishery data,
- Bruce Barker: SEMR benthic video data
- Ian McLeod: GIS, regional environmental datasets

SEMR benthic assessment tasks

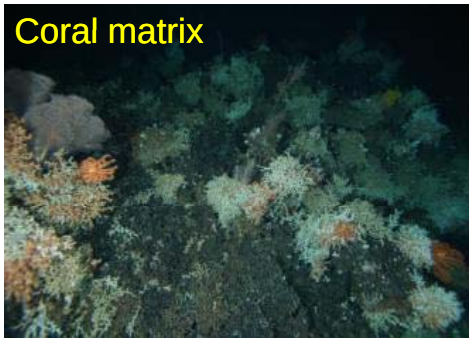
- collate spatial-temporal data on human uses that interact with the seabed in the SEMR, including but not only fishing (esp. trawling)
- collate existing data on benthic habitats, assemblages, species - morphotypes, and their sensitivity to & recovery from human uses
- predict distributions of available components of benthic biodiversity, across the SEMR
- integrate into a dynamic model for the SEMR, to quantify and assess the levels of cumulative impacts on benthic biodiversity
- identify strategies that have been implemented for managing uses in the SEMR, including reserves, and use the model to evaluate their benefits and trade-offs

SEMR: benthic survey sites distribution

- Image data
  - Video transects
  - Still images
    - AUV grids (CERF data)
- Sampling surveys
  - CMAR
    (identification variable – morphotypes & species)
  - Museum Victoria
    (collection data to be sourced)
  - Scallop surveys
    (collection data to be sourced)



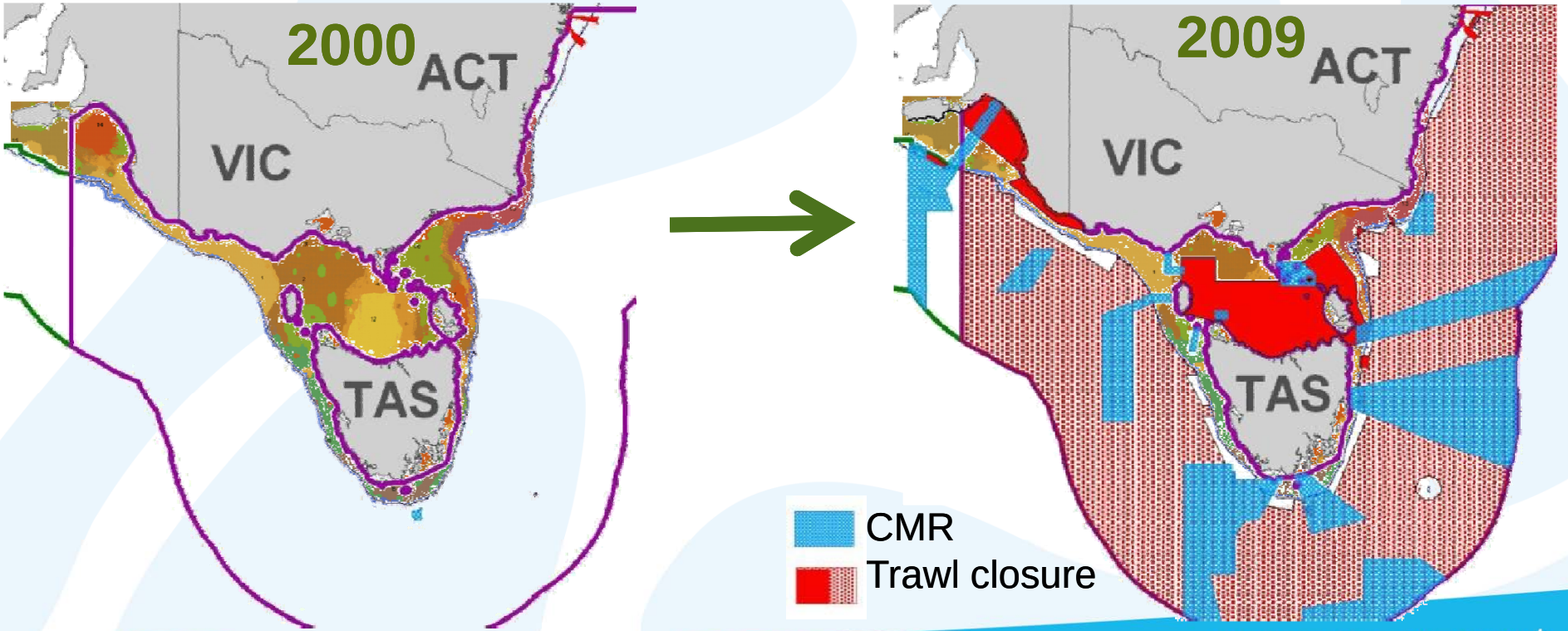
SEMR: example benthic biodiversity types

Corals	Sponges	Other epifauna	Sediments
 Coral matrix	Sponge garden	Stalked crinoids	Bioturbated sediments
Stand of whip corals	Sponge garden	Bryozoan thicket	Bioturbated sediments
Gold corals	Sponge community	Anemones	Rippled sediments

High diversity → highly variable vulnerability and recovery potential

SEMR: ocean uses and management

- e.g. fishing effort distribution:
  - AFMA logbooks → annual maps of fishing effort by gear
  - State fisheries data (to be sourced - e.g. scallop, southern shark)
- Offshore oil & gas (to be sourced)
- Management actions/implementations: e.g.



SEMR benthic project links:

- Theme 1: ↔ collation and analysis of existing datasets, new monitoring survey data, guidance for future monitoring of biodiversity in CMRs
- Theme 2: ↔ knowledge & skills re environmental values, integrating threats, landscape approaches
- Theme 3: ↔ shelf and canyon ecosystems knowledge, national maps of biodiversity and connectivity
- External: commonwealth and state fisheries, stock assessment teams, tropical ecosystems hub, international effects of fishing researchers

SEMR benthic outcomes & benefits:

- data integration, improved knowledge & understanding of benthic biodiversity distribution, protection and vulnerability → Strategy 1.
- improve knowledge & understanding of pressures, and cumulative impacts of uses on benthic biodiversity → Strategy 1 & 3.
- integration and understanding of the effectiveness of spatial and fishery management strategies for benthic biodiversity conservation and trade-offs for users → Strategy 6.
- capacity to evaluate future options for improving reserve and other management re conservation, sustainability risk and industry performance → Strategy 3 & 6.

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The information in this presentation was generated by the Marine Biodiversity Hub and its partners for the purpose of consultation and collaboration with marine stakeholders in improving the evidence-base for decision making for marine biodiversity management. The Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program. The results should not be used or taken as final and are not for circulation outside of this audience without prior permission.

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