

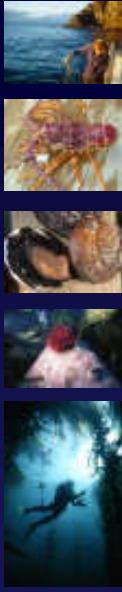
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Reproductive periodicity in the blacklip abalone *Haliotis rubra*

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Why study Spawning periodicity?

- Evaluate/optimize seasonal closures
- better understand ecology and behavioural characteristics
- identify when to sample for fecundity estimates
- identify when to sample for larval supply issues/recruitment
- avoid Allee effects

Key Questions;

1. when do they spawn?
2. how often they spawn?
3. sites/regions spawn at the same time?
4. is spawning synchronous (within sites)?
5. is spawning predictable/regular



Data available ...

Monthly histological sections from;

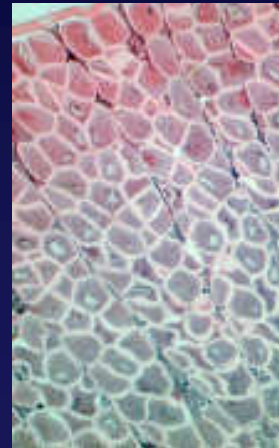
George III Rock 1988 – 1992

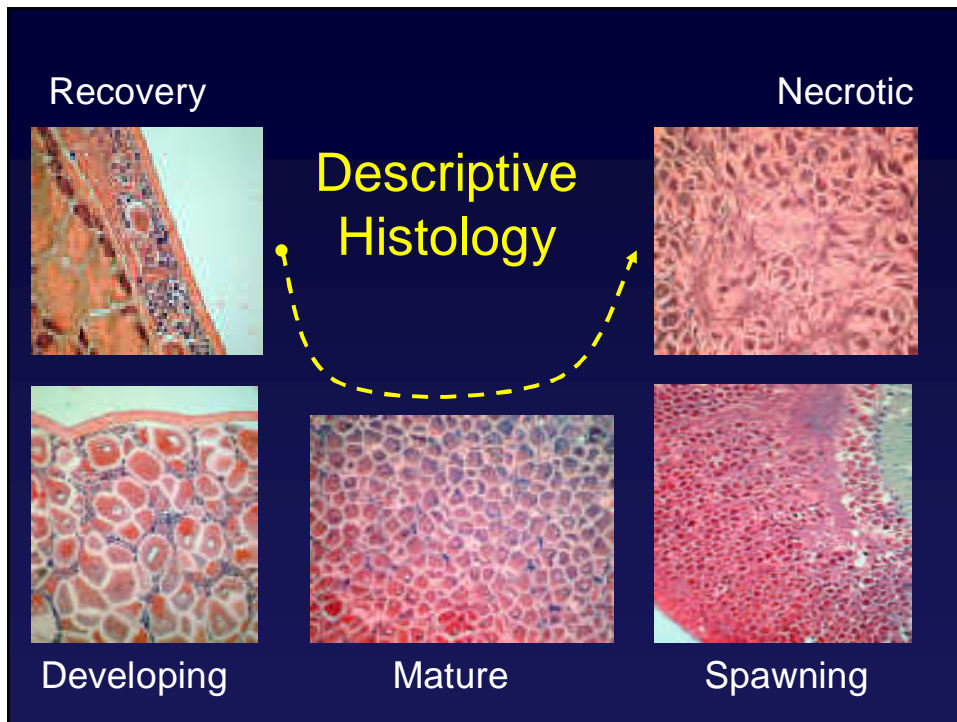
Shag Rock Bay 1991 – 1992

Stinking bay 1991 – 1992

(Average size ~ 140mm – 149mm)

1. Descriptive histology
2. Oocyte size/stage frequency

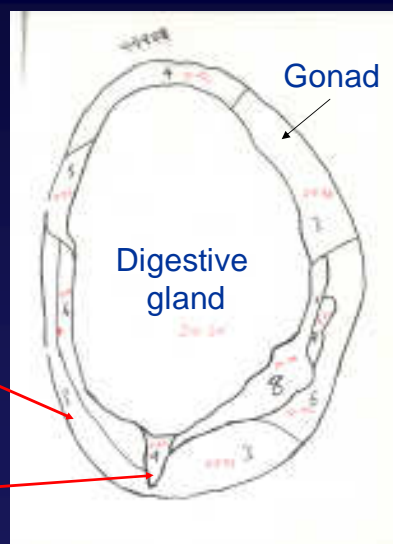




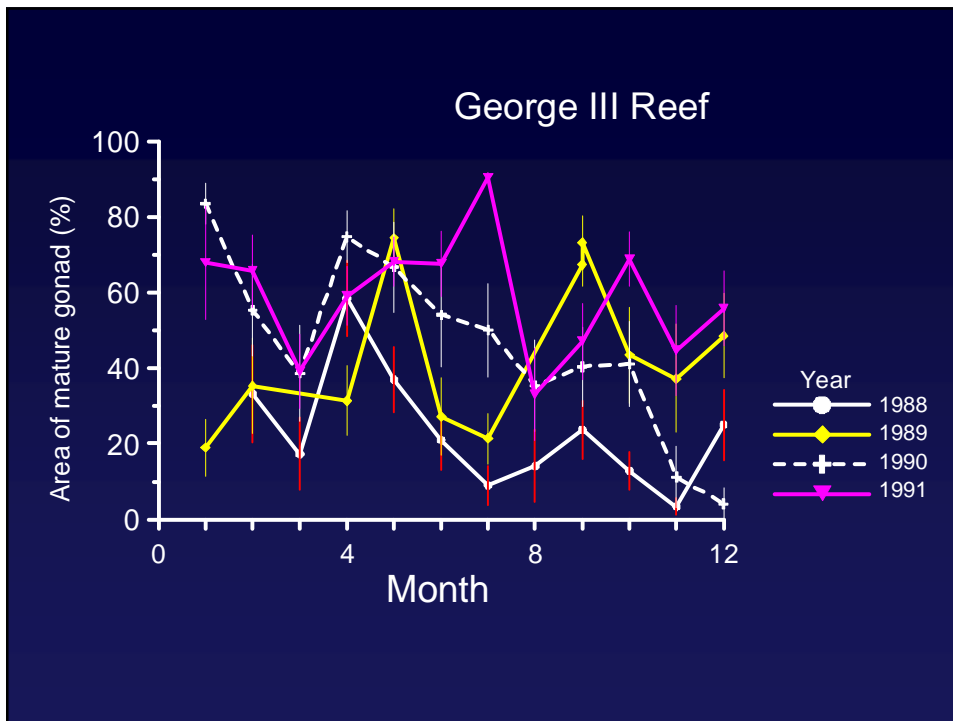
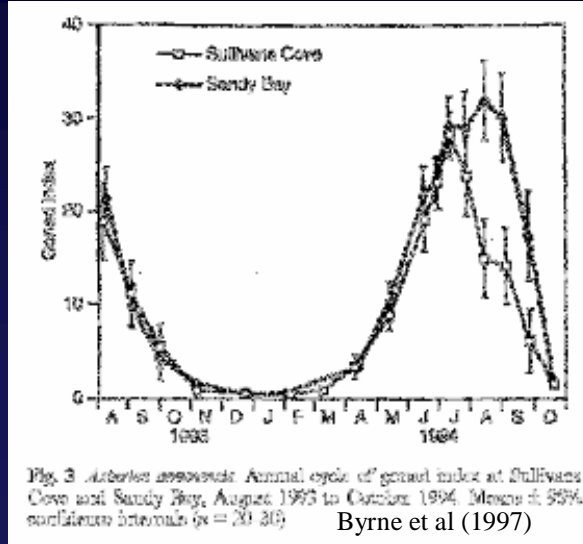
Descriptive histology

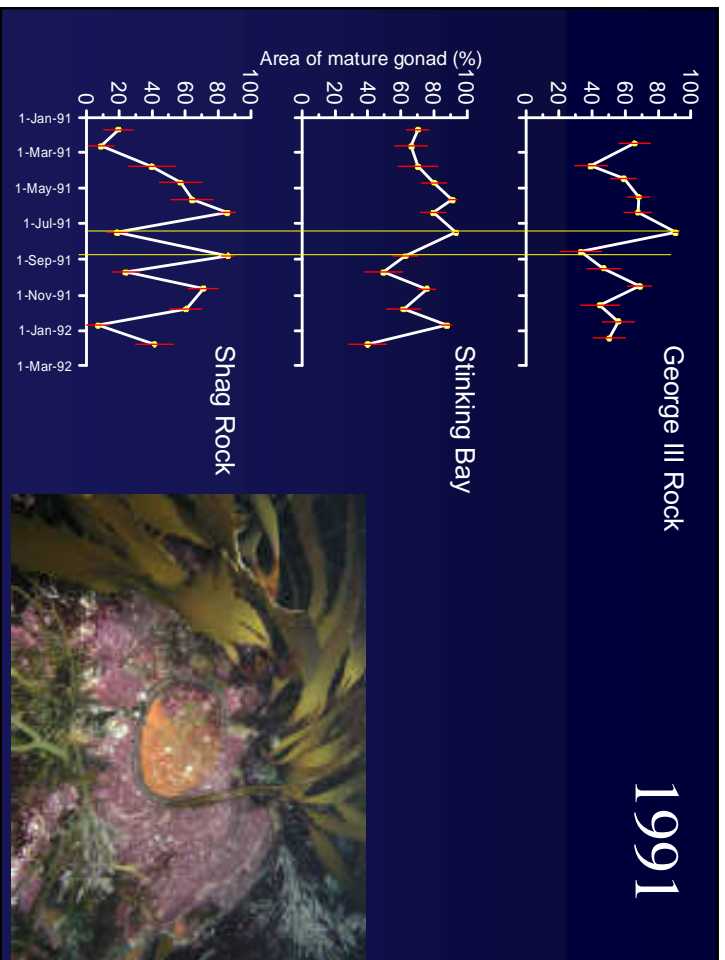
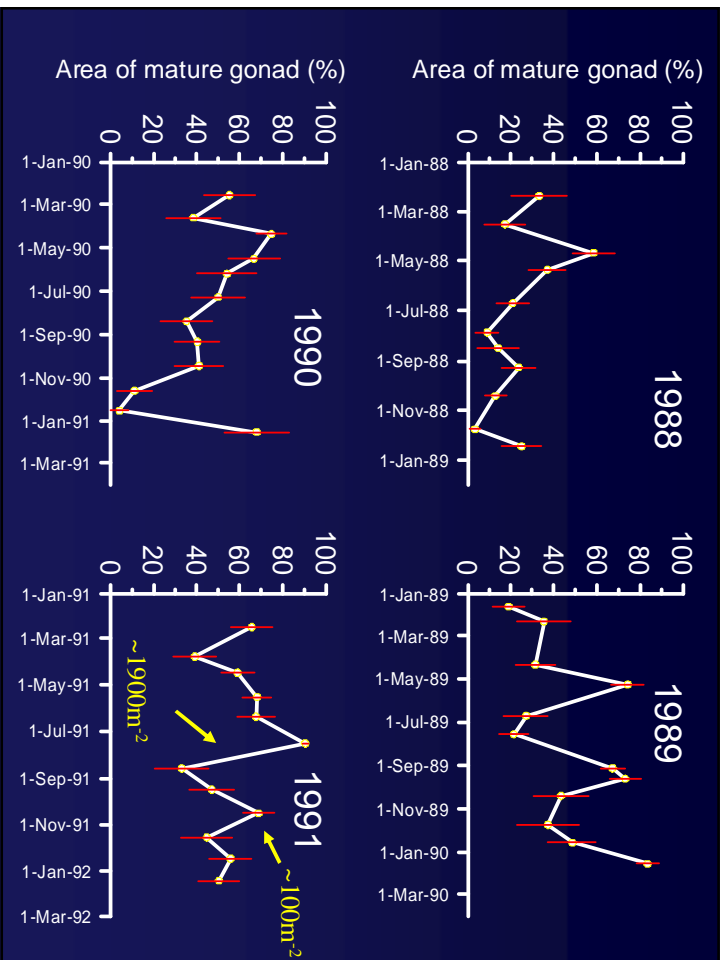
Determine areas of each maturity phase from histology slide:

1. Recovery (1, 2, 8)
2. Developing (3)
3. Mature (4, 5)
4. Spawning (6)
5. Necrotic (7)



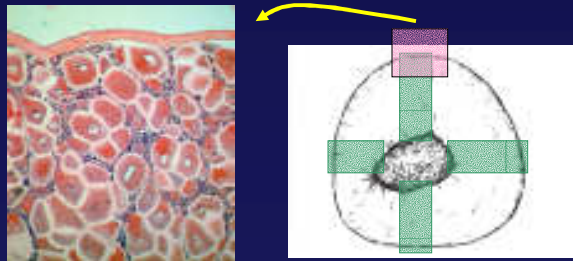
Ideal spawning periodicity



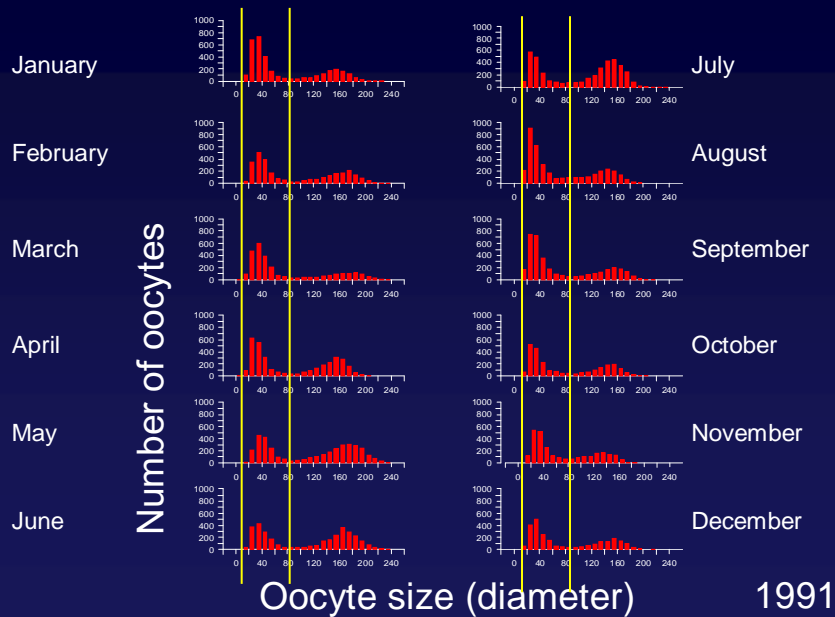


Oocyte size frequency

1. Oocyte size measured (using Sigma scan)
2. Only oocytes sectioned through the nucleus measured
3. Sampling done from 4 transects across the gonad



Oocyte size frequency



Oocyte stage frequency

Vitellogenic

<u>Source</u>	<u>Variance</u>
Month	16.6%
Individual(month)	38.9%
Transect (Individual)	44.5%

Pre-vitellogenic

<u>Source</u>	<u>Variance</u>
Month	5.6%
Individual(month)	10.5%
Transect (Individual)	83.9%

Conclusions ?

Spawning periodicity

- 1) When – a-seasonal
- 2) how often – serial spawners
- 3) synchrony among distant sites – no
- 4) synchrony within sites – not always
- 5) predictable? – unlikely!

Minor (but not trivial) implications for fishery management

- seasonal closures of no benefit
- size-specific fecundity
 - single point estimates not useful
 - require cumulative fecundity/unit time
- sampling for larval supply - ??

Major implications for fishery management

Consider a system where there are;

- unpredictable, multiple spawnings/year
- variable participation within populations
- variable gamete release/individual

→ fertilization success requires aggregations

→ aggregations more susceptible to fishing

Action

Identify size limits that;

- allow aggregations to develop and be maintained
- protect sufficient proportion of the breeding population to prevent local collapse
- allow access to the resource

