The RAM II stock-recruitment database
An historical and technological overview

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RAM's original database

- A lifelong endeavour that started when RAM worked at DFO
- First summarised in a technical report and resulted in numerous publications
- Focused on:
  - Meta-analytical methods to draw strength from many stocks
  - The relationship between spawning stock and recruitment
  - Maximum reproductive rate at low spawning stocks
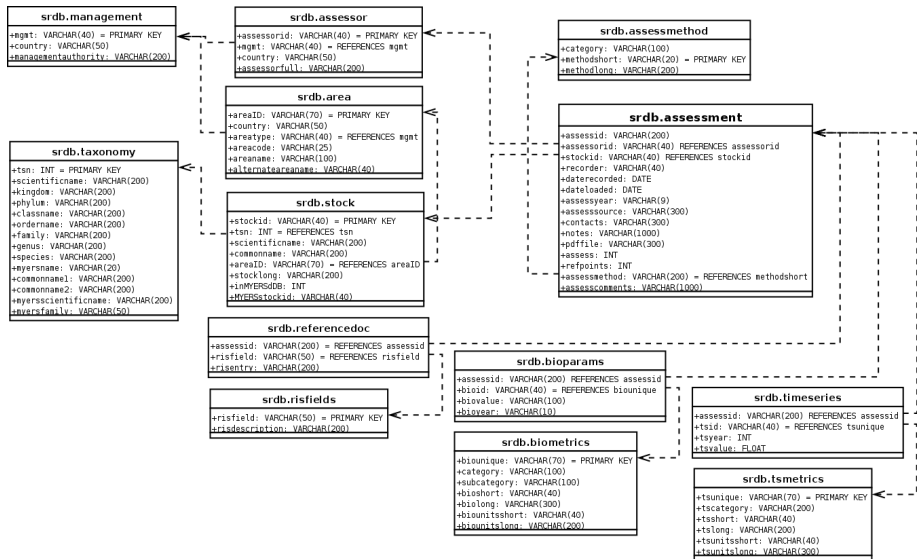- Housed in flat text files and handled by a variety of scripts (mostly Perl, SPlus and SAS)

Archived on server (i.e not updated anymore) and available from the following URL:

`http://chase.mathstat.dal.ca/~myers/welcome.html`

RAM II database - srdb

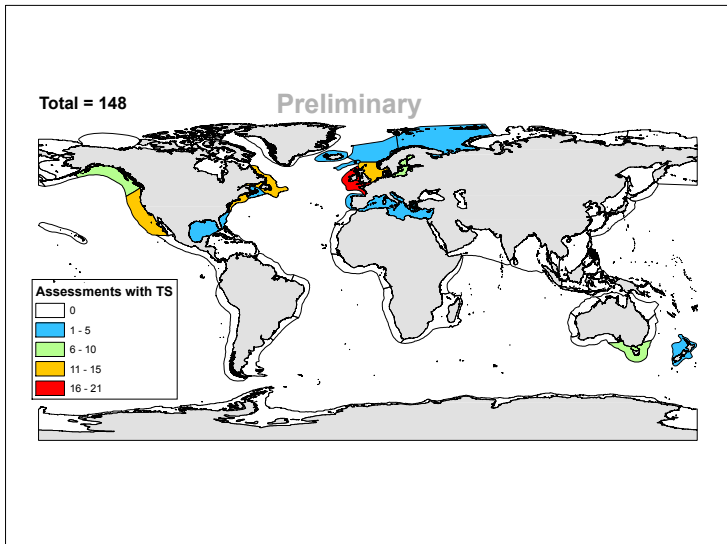- A user-built database
- A relational database using the Open Source postgreSQL RDBMS with postGIS
- Internet accessible (TCP/IP), concurrent users, privileges and credentials
- Data from individual assessments are captured in a standardised spreadsheet file
- Suite of Open Source tools used for development (BASH, Perl, LaTeX, R, Python)
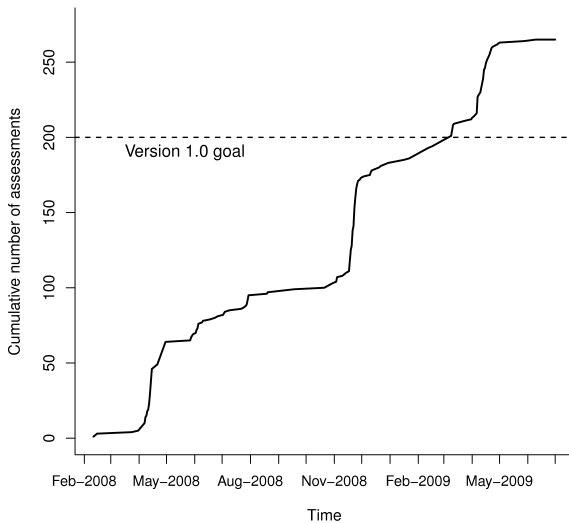- Under version control using the Open Source Subversion system

Database structure - Entity relationship diagram

srdb.management
+mgmt: VARCHAR(40) = PRIMARY KEY
+country: VARCHAR(50)
+managementauthority: VARCHAR(200)

srdb.assessor
+assessorid: VARCHAR(40) = PRIMARY KEY
+mgmt: VARCHAR(40) = REFERENCES mgmt
+country: VARCHAR(50)
+assessorfull: VARCHAR(200)

srdb.assessmethod
+category: VARCHAR(100)
+methodshort: VARCHAR(20) = PRIMARY KEY
+methodlong: VARCHAR(200)

srdb.area
+areaID: VARCHAR(70) = PRIMARY KEY
+country: VARCHAR(50)
+areatype: VARCHAR(40) = REFERENCES mgmt
+areacode: VARCHAR(25)
+areaname: VARCHAR(100)
+alternateareaname: VARCHAR(40)

srdb.assessment
+assessid: VARCHAR(200)
+assessorid: VARCHAR(40) REFERENCES assessorid
+stockid: VARCHAR(40) REFERENCES stockid
+assessor: VARCHAR(40)
+daterecorded: DATE
+dateloaded: DATE
+assessyear: VARCHAR(9)
+assesssource: VARCHAR(300)
+contacts: VARCHAR(300)
+notes: VARCHAR(1000)
+pdffile: VARCHAR(300)
+assess: INT
+refpoints: INT
+assessmethod: VARCHAR(200) = REFERENCES methodshort
+assesscomments: VARCHAR(1000)

srdb.taxonomy
+tsn: INT = PRIMARY KEY
+scientificname: VARCHAR(200)
+kingdom: VARCHAR(200)
+phylum: VARCHAR(200)
+classname: VARCHAR(200)
+ordername: VARCHAR(200)
+family: VARCHAR(200)
+genus: VARCHAR(200)
+species: VARCHAR(200)
+myersname: VARCHAR(20)
+commonname1: VARCHAR(200)
+commonname2: VARCHAR(200)
+myersscientificname: VARCHAR(200)
+myersfamily: VARCHAR(50)

srdb.stock
+stockid: VARCHAR(40) = PRIMARY KEY
+tsn: INT = REFERENCES tsn
+scientificname: VARCHAR(200)
+commonname: VARCHAR(200)
+areaID: VARCHAR(70) = REFERENCES areaID
+stocklong: VARCHAR(200)
+inMYERSsdDB: INT
+MYERSstockid: VARCHAR(40)

srdb.referencedoc
+assessid: VARCHAR(200) = REFERENCES assessid
+risfield: VARCHAR(50) = REFERENCES risfield
+risentry: VARCHAR(200)

srdb.bioparams
+assessid: VARCHAR(200) REFERENCES assessid
+bioid: VARCHAR(40) = REFERENCES biounique
+biovalue: VARCHAR(100)
+bioyear: VARCHAR(10)

srdb.timeseries
+assessid: VARCHAR(200) REFERENCES assessid
+tsid: VARCHAR(40) = REFERENCES tsunique
+tsyear: INT
+tsvalue: FLOAT

srdb.risfields
+risfield: VARCHAR(50) = PRIMARY KEY
+risdescription: VARCHAR(200)

srdb.biometrics
+biounique: VARCHAR(70) = PRIMARY KEY
+category: VARCHAR(100)
+subcategory: VARCHAR(100)
+bioshort: VARCHAR(40)
+biolong: VARCHAR(200)
+biounitsshort: VARCHAR(40)
+biounitslong: VARCHAR(200)

srdb.tsmetrics
+tsunique: VARCHAR(70) = PRIMARY KEY
+tscategory: VARCHAR(200)
+tsshort: VARCHAR(40)
+tslong: VARCHAR(200)
+tsunitsshort: VARCHAR(40)
+tsunitslong: VARCHAR(300)

Demo session

RAMlegacy portal:
http://www.marinebiodiversity.ca/RAMlegacy

How to:

1. Submit an assessment
2. Track assessment progress
3. Connect to the database on
   - development server
   - local machine from UW
4. Get timeseries data in R and plot SSB and F
5. SSB temporal trends pre- and post-1992
6. Generate a QAQC document using Perl script

Release of srdb version 1.0

Points to consider before wider distribution and usage:

- How to make this data authoritative? **QC/QA**
- How to make this data citable? **Metadata and summary publication**
- How to make analyses reproducible? **Versioning of database content**
- How to ensure usability? **Documentation, tailored database views as data products for users**

Complete entry of top-twenty tonnage fisheries

Anticipated formal release: **early 2010**
Submit manuscript and copy database to production server at Dalhousie

Longterm plans

- Addition of stocks from other areas (Africa, South America, Asia),
- Addition of new species (salmonids, freshwater fishes, invertebrates)
- Addition of ancillary data (management, economic, life history data.....)
- Engage with regional fisheries agencies for timely inclusion of new assessments
- Ensure appropriate linkages with other global fisheries-related databases (Fishbase, SAUP, FAO catch statistics)

Acknowledgments

Sincere thanks to:

RAM
All assessment scientists
All recorders
NCEAS working group and DGS