Catalogue Futures
or
Thoughts on Requirements for dbloc3

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PRIMARY CATALOGUE SET
ROUTINE OPERATIONS

Real-time auto locations

↓

Real-time db
60-90 days
(daily review)

↓

db_2012_01

db_2011_12

db_2011_11

db_2011_10

db_2011_09

Etc.

Monthly dbs split off from the real-time db each month (monthly review).

NETWORK CATALOGUES
- Consist of event locations
- Created by daily & monthly review

EXTERNAL AGENCY BULLETINS
- Origins, magnitudes

External Agency catalogues or bulletins that are associated with the local network solutions to produce the network catalogue.
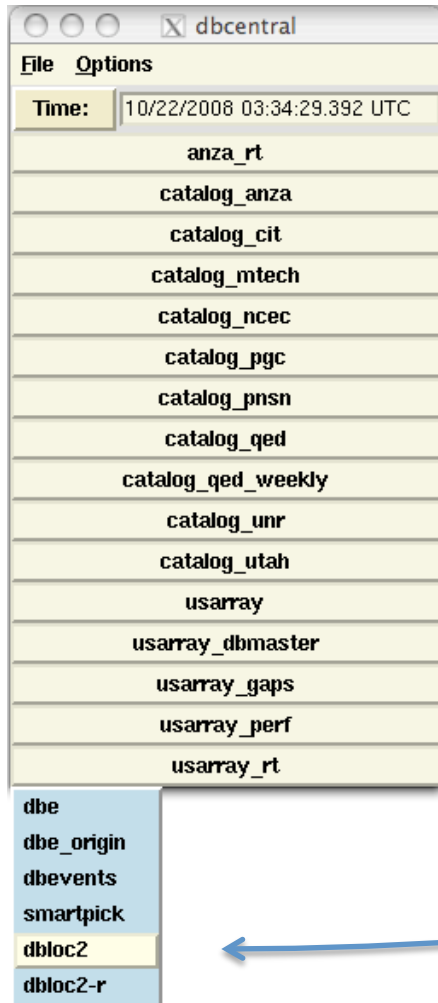
QED weekly
(USGS NEIC)

PNSN

AEIC

MTECH

Etc.

Catalogue Collection: dbcentral

- Collects all databases in one place
- Desired time entered in "Time:" bar
- Select program to run on a given database

Catalogue Rules

By Catalogue Regions & Sub-Regions

- Velocity models
- Depths: *fixed or free*
- Phases used in location: *P, S* or *Pn, Sn* or *Pn, Pg, Sn, Sg*
- Distance limitations for stns used in solution
- Minimum magnitude levels (catalogue completeness)

E.G. Western Canada
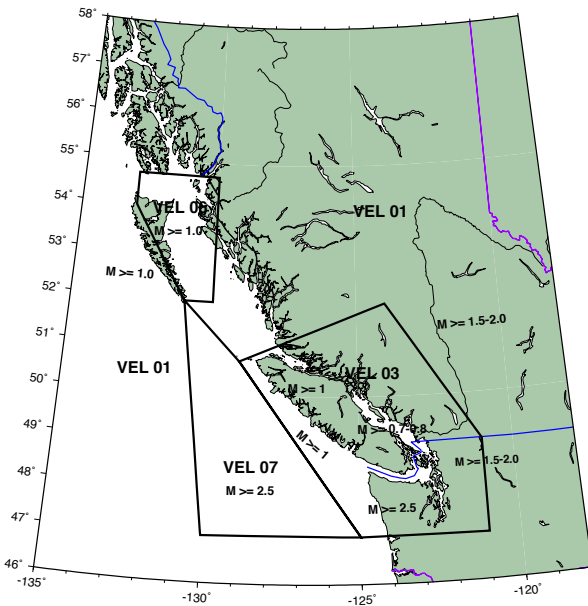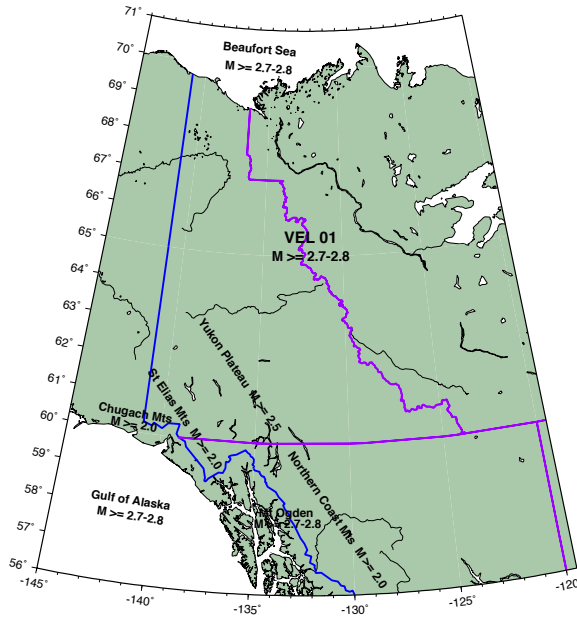
Region	Subregion	Completeness level	Velocity model	Depth
Washington state/Utah	lat < 49, lon > -121	ML >= 1.5-2.0	cn01	
NW Washington state	47 >= lat < 49, lon >= -121 NOTE: Lat <= 48 and well located by UW, fix PGC soln to UW soln.	ML >= 2.5	cn03	
SW BC	Southern VI	ML >= 0.7-0.8	cn03	free
	Northern VI	ML >= 1.0		
	Offshore NAM plate	ML >= 1.0		
	Southern Coast Mountains	ML >= 0.7-0.8		1, 5 km if no stn >= 50 km
	Offshore VI	ML(Sn) >= 2.5	cn07	10 km
Queen Charlotte Islands	Eastern QC, Dixon Entrance, Hecate Strait	ML >= 1.0	cn06	free
	Western QC, QC fault	ML >= 1.0	cn01	20 km
SE BC & Alberta		ML,mb(Lg) > 1.5-2.0	cn01	
Northern BC, YT, & western NWT	lon >= -140	ML >= 2.7-2.8	cn01	
	-145 <= lon <= -141	ML > 3.0		
	Northern Coast Mountains	ML > 2.0		1, 5, 10 km
	Northern Coast Mountains (Mt. Ogden swarms)	ML >= 2.7-2.8		5 km
	Southeastern Alaska (Panhandle)	ML >= 2.0		1, 5, 10 km / Fairweather fault = 1 km / Glacier Bay = 10 km
	Gulf of Alaska	ML >= 2.7-2.8		10 km
	Chugach Mts, Alaska	ML >= 2.0		1, 5, 10 km
	St. Elias Mts	ML >= 2.0		1,5,10 km
	Richardson Mountains, YT/NWT	ML >= 2.7-2.8		20 km
	Ogilvie Mountains, YT	ML >= 2.7-2.8		1,5,10 km
	Wernecke Mountains, YT	ML >= 2.7-2.8		1,5,10 km
	MacKenzie Mountains, NWT	ML >= 2.7-2.8		1,5,10 km
	Yukon Plateau	ML >= 2.5		1,5,10,15 km
	Beaufort Sea	ML(Sn),mb,Ms >= 2.7-2.8		35 km

Map labels (top map):
Beaufort Sea M >= 2.7-2.8
VEL 01 M >= 2.7-2.8
Yukon Plateau M >= 2.5
St Elias Mts M >= 2.0
Chugach Mts M >= 2.0
Gulf of Alaska M >= 2.7-2.8
Mt Ogden M >= 2.7-2.8
Northern Coast Mts M >= 2.0

Map labels (bottom map):
VEL 06 M >= 1.0
VEL 01
M >= 1.0
VEL 01 M >= 1.5-2.0
VEL 03 M >= 1
M >= 0.7-0.8
M >= 1
M >= 1.5-2.0
M >= 2.5
VEL 07 M >= 2.5

TRACKING EVENT REVIEW AND CATALOGUE CHANGES

- ## Daily Review & Monthly Review
  - *Assigned to XX (daily)*
  - *Document changes: e.g. magnitude threshholds*
  - *Completed (event review & db health)*
- ## Location Program History
- ## Catalogue History

Location Program History

Year	Location Programs
prior to 1972	Hand locations
1972 – 1976	CANCESS
1976 – 1980	CANCESS; for southwestern BC – Hypo71
1980 – 1991	CANCESS; for southwestern BC – Hypoellipse
1991 – 2006	LocEq
2006 to present	Genloc

| Date	Change	Details
2004 11 01	Mw'= ML(Sn) + 0.6 Offshore VI (all events within JDF plate system)	-interim magnitude before Mw(JR) is released, specifically wrt web and media -2004 Nov offshore swarm
2002 11 01	Denali aftershocks M≈2.5	
2002 11 03	Denali aftershocks M≈3.0	Denali mainshock M=7.9
2000 01 01	For earthquakes fix depth to 1.0 km (previously fixed to 0km), For blasts fix depth to 0 km.	Rupture never starts at the surface, it starts at some depth and moves upwards. Assumption is that the minumum realistic depth rupture could commence would be 1km. Hence if an event free depth wants to be 0km, this cannot be true, so fix event to 1km depth.

Secondary Catalogue Set

Auto P-nodal	**P-nodal**
Auto Moment Tensor	**Moment Tensor**

FOCAL MECHANISMS
- Automated,& reviewed
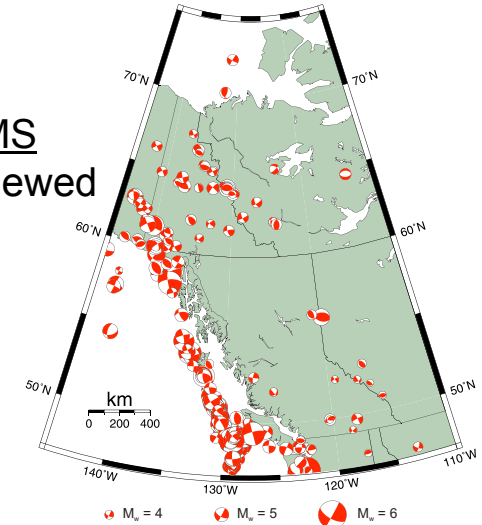
Felt events

Comments on where event was felt, intensity levels, damage.

Polarity Reversals

Teleseismic events used for determining polarity reversals.

Cascadia

Divide events into either the Juan de Fuca plate or the North America plate.

Hazard

Events with magnitudes used to determine seismic hazard levels, by region, for input into the National Building Code. Prefmag very useful, especially for large historic events.

Tools

- X-correlation (teleseismic arrivals)
- Various magnitude calculators
- Schema: *models0.4 (velocity models)*
- Dbloc2
- smartpick
- dbcentral

Difficulties

- Marking first motions … keyboard input? Dbpick display(⬇⬆)?
  data input into traditional fm programs such as fpfit, focmec, etc.
- Tracking work done
- Tracking catalogue changes
- Tracking polarity reversals

Soliciting Input, Requirements, Needs…

- Rtbulletin
- Custom bulletins…perhaps something easily configurable?
- Handeling of unassociated arrivals (1 or 2 stn arrivals)
- Niko has isc bulletin…submission to contrib?
- Focmec script?
  - Fpfit module from USGS # could be platform problems…does it run on mac, Sun, Linux?
- Keyboard control for arrival interface
- Deleting arrivals, fm up/down, eliminate mags
- Magnitude control: dynamic user control over signal to noise ratio, eliminate mags from netmag
- Assoc >= 400 stns (big prob for usarray and other extremely large networks)
- Dbpick (jurij): customize preferences such as filters in a new window, such as sensible default filter or a parameter file specifying preferences.
- Daily network (or sensible subset) scanning for missed events…must be quick (ie I can visually scan hourly network plots (2pages/hr) in ~15 min and document all events to be processed for the day). This is essential to catch small local events that orbdetect/orbassoc misses. Orbassoc catches lots of teleseisms that the naked eye misses on these plots.
- Tectonic plates on maps (important for media interviews, emergency response info, research)
- Niko would like more languages with dbrecenteqs
- P-nodal: need azm & takeoff angle. Can get polarily flips at certain takeoff angles for crustal phases, this needs to be accounted for.

- Need dbloc3 man page written by user (essentially specifies user reqs)…TM +KENT