

Chilean Seismological Network

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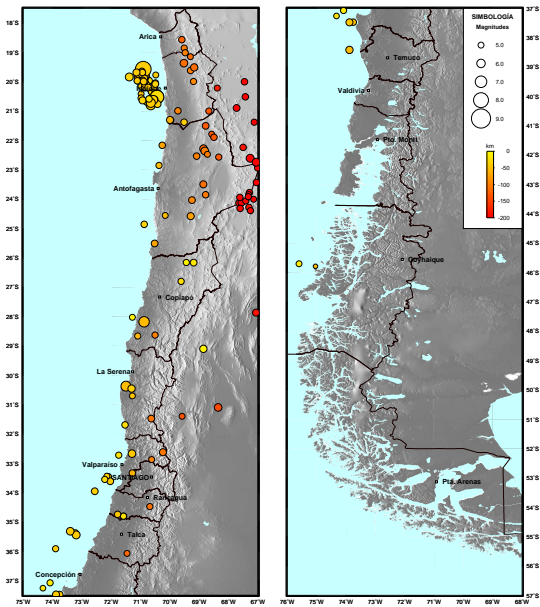
Centro Sismológico Nacional (CSN)

July 2014

Our mission is monitoring and keep a complete registry of all the earthquakes that occurs in Chile to deliver, at any time and at any moment, the most complete information to the government agencies, authorities and to the people that design and improve seismic norms that guide the construction of buildings and structures in our land.

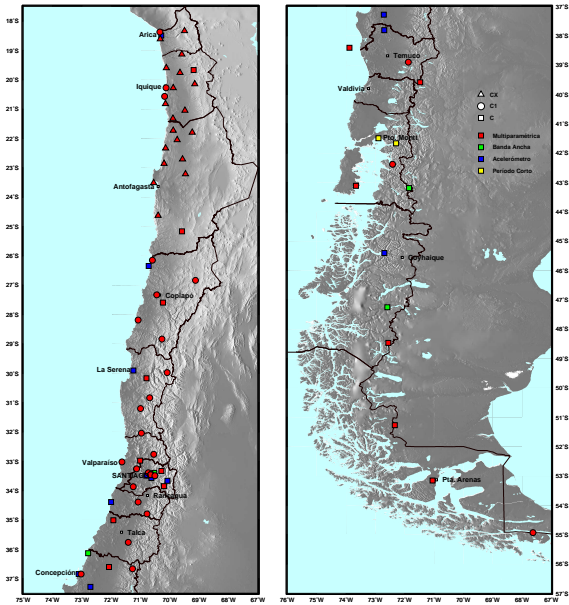
To accomplish our mission we must maintain a large, robust and reliable network of seismological stations in the whole country.

Seismicity



Earthquakes with magnitude greater than 5 in Chile region since June, 2013

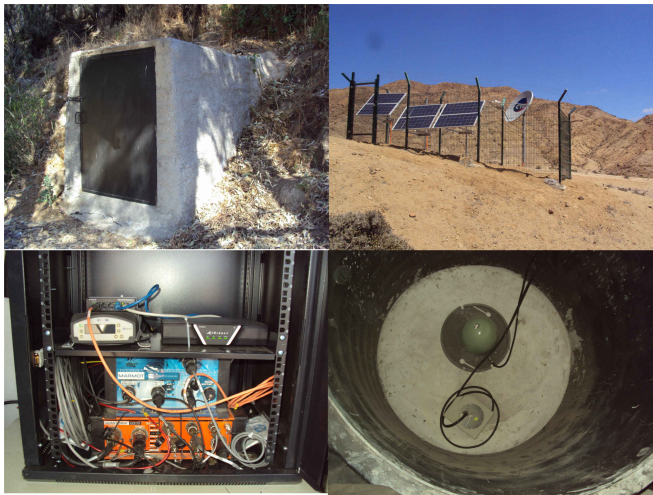
Stations in Chile



Network	Stations
C1	30
C	31
CX	19
G	2
UI	1

Map and table of actual seismicological stations in Chilean territory

Typical Station



Photos of a typical seismicological station of the new network C1

Net	Dig	BroadB	Acc	Datalog
C1	Q330	Trillium 120	CMG-5T	Marmot (with Antelope)
C	Q330 ED PS6-24	Trillium 120 Trillium 40	Epi FBA ES-T	Baler
CX	Q330 Q330HR	STS-2	Epi FBA ES-T	Baler

Digitizers used in stations located in Chilean territory

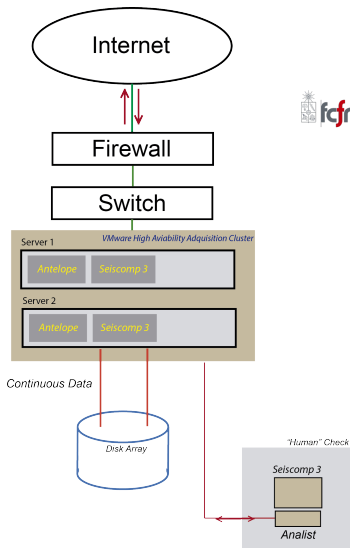


Adquisition and Processing

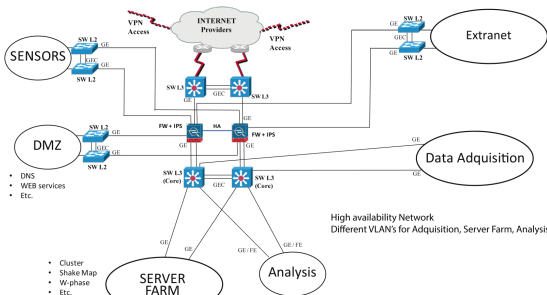
- Adquisition: Seiscomp 2.6
- Automatic processing: EarlyBird, EarthWorm
- Manual processing: Seisan

- Short term
 - Use of PDL to share specific data with USGS
 - 2nd Datacenter
 - Satellite Hub at CSN
 - Backbone of 20 stations
 - Database of waveform-CSN. Data open to everyone
 - GPS in Real Time
 - Portable Datacenter Hot Stand By
 - Shakecast
- Long term
 - Communicate 297 accelerometers for real time purposes (2 years)
 - 3 contingency sites (northern-center-southern)
 - Network expansion to 900 multiparameter stations (10 years)

New Datacenter



DATA CENTER NETWORK



Future developments

CSN WPhase Moment Solution¹

Origin time: 2014/ 4/11 23:46:45.00
 Latitude: -19.1700
 Longitude: -70.9800
 Depth: 35.000 [km]
 Weight: 3.18

CSN WPhase Centroid Moment Tensor

Centroid: 19.1700; -70.9800
 Depth: 35.000 Km
 Number of Stations: 31 P1014 CO20 CO202 CO203 CO204 CO205 CO206 CO207 CO208 CO209 CO210 CO211 CO212 CO213 CO214 CO215 CO216 CO217 CO218 CO219 CO220 CO221 CO222 CO223 CO224 CO225 CO226 CO227 CO228 CO229 CO230 CO231 CO232 CO233 CO234 CO235 CO236 CO237 CO238 CO239 CO240 CO241 CO242 CO243 CO244 CO245 CO246 CO247 CO248 CO249 CO250 CO251 CO252 CO253 CO254 CO255 CO256 CO257 CO258 CO259 CO260 CO261 CO262 CO263 CO264 CO265 CO266 CO267 CO268 CO269 CO270 CO271 CO272 CO273 CO274 CO275 CO276 CO277 CO278 CO279 CO280 CO281 CO282 CO283 CO284 CO285 CO286 CO287 CO288 CO289 CO290 CO291 CO292 CO293 CO294 CO295 CO296 CO297 CO298 CO299 CO300 CO301 CO302 CO303 CO304 CO305 CO306 CO307 CO308 CO309 CO310 CO311 CO312 CO313 CO314 CO315 CO316 CO317 CO318 CO319 CO320 CO321 CO322 CO323 CO324 CO325 CO326 CO327 CO328 CO329 CO330 CO331 CO332 CO333 CO334 CO335 CO336 CO337 CO338 CO339 CO340 CO341 CO342 CO343 CO344 CO345 CO346 CO347 CO348 CO349 CO350 CO351 CO352 CO353 CO354 CO355 CO356 CO357 CO358 CO359 CO360 CO361 CO362 CO363 CO364 CO365 CO366 CO367 CO368 CO369 CO370 CO371 CO372 CO373 CO374 CO375 CO376 CO377 CO378 CO379 CO380 CO381 CO382 CO383 CO384 CO385 CO386 CO387 CO388 CO389 CO390 CO391 CO392 CO393 CO394 CO395 CO396 CO397 CO398 CO399 CO400 CO401 CO402 CO403 CO404 CO405 CO406 CO407 CO408 CO409 CO410 CO411 CO412 CO413 CO414 CO415 CO416 CO417 CO418 CO419 CO420 CO421 CO422 CO423 CO424 CO425 CO426 CO427 CO428 CO429 CO430 CO431 CO432 CO433 CO434 CO435 CO436 CO437 CO438 CO439 CO440 CO441 CO442 CO443 CO444 CO445 CO446 CO447 CO448 CO449 CO450 CO451 CO452 CO453 CO454 CO455 CO456 CO457 CO458 CO459 CO460 CO461 CO462 CO463 CO464 CO465 CO466 CO467 CO468 CO469 CO470 CO471 CO472 CO473 CO474 CO475 CO476 CO477 CO478 CO479 CO480 CO481 CO482 CO483 CO484 CO485 CO486 CO487 CO488 CO489 CO490 CO491 CO492 CO493 CO494 CO495 CO496 CO497 CO498 CO499 CO500 CO501 CO502 CO503 CO504 CO505 CO506 CO507 CO508 CO509 CO510 CO511 CO512 CO513 CO514 CO515 CO516 CO517 CO518 CO519 CO520 CO521 CO522 CO523 CO524 CO525 CO526 CO527 CO528 CO529 CO530 CO531 CO532 CO533 CO534 CO535 CO536 CO537 CO538 CO539 CO540 CO541 CO542 CO543 CO544 CO545 CO546 CO547 CO548 CO549 CO550 CO551 CO552 CO553 CO554 CO555 CO556 CO557 CO558 CO559 CO560 CO561 CO562 CO563 CO564 CO565 CO566 CO567 CO568 CO569 CO570 CO571 CO572 CO573 CO574 CO575 CO576 CO577 CO578 CO579 CO580 CO581 CO582 CO583 CO584 CO585 CO586 CO587 CO588 CO589 CO590 CO591 CO592 CO593 CO594 CO595 CO596 CO597 CO598 CO599 CO600 CO601 CO602 CO603 CO604 CO605 CO606 CO607 CO608 CO609 CO610 CO611 CO612 CO613 CO614 CO615 CO616 CO617 CO618 CO619 CO620 CO621 CO622 CO623 CO624 CO625 CO626 CO627 CO628 CO629 CO630 CO631 CO632 CO633 CO634 CO635 CO636 CO637 CO638 CO639 CO640 CO641 CO642 CO643 CO644 CO645 CO646 CO647 CO648 CO649 CO650 CO651 CO652 CO653 CO654 CO655 CO656 CO657 CO658 CO659 CO660 CO661 CO662 CO663 CO664 CO665 CO666 CO667 CO668 CO669 CO670 CO671 CO672 CO673 CO674 CO675 CO676 CO677 CO678 CO679 CO680 CO681 CO682 CO683 CO684 CO685 CO686 CO687 CO688 CO689 CO690 CO691 CO692 CO693 CO694 CO695 CO696 CO697 CO698 CO699 CO700 CO701 CO702 CO703 CO704 CO705 CO706 CO707 CO708 CO709 CO710 CO711 CO712 CO713 CO714 CO715 CO716 CO717 CO718 CO719 CO720 CO721 CO722 CO723 CO724 CO725 CO726 CO727 CO728 CO729 CO730 CO731 CO732 CO733 CO734 CO735 CO736 CO737 CO738 CO739 CO740 CO741 CO742 CO743 CO744 CO745 CO746 CO747 CO748 CO749 CO750 CO751 CO752 CO753 CO754 CO755 CO756 CO757 CO758 CO759 CO760 CO761 CO762 CO763 CO764 CO765 CO766 CO767 CO768 CO769 CO770 CO771 CO772 CO773 CO774 CO775 CO776 CO777 CO778 CO779 CO780 CO781 CO782 CO783 CO784 CO785 CO786 CO787 CO788 CO789 CO790 CO791 CO792 CO793 CO794 CO795 CO796 CO797 CO798 CO799 CO800 CO801 CO802 CO803 CO804 CO805 CO806 CO807 CO808 CO809 CO810 CO811 CO812 CO813 CO814 CO815 CO816 CO817 CO818 CO819 CO820 CO821 CO822 CO823 CO824 CO825 CO826 CO827 CO828 CO829 CO830 CO831 CO832 CO833 CO834 CO835 CO836 CO837 CO838 CO839 CO840 CO841 CO842 CO843 CO844 CO845 CO846 CO847 CO848 CO849 CO850 CO851 CO852 CO853 CO854 CO855 CO856 CO857 CO858 CO859 CO860 CO861 CO862 CO863 CO864 CO865 CO866 CO867 CO868 CO869 CO870 CO871 CO872 CO873 CO874 CO875 CO876 CO877 CO878 CO879 CO880 CO881 CO882 CO883 CO884 CO885 CO886 CO887 CO888 CO889 CO890 CO891 CO892 CO893 CO894 CO895 CO896 CO897 CO898 CO899 CO900 CO901 CO902 CO903 CO904 CO905 CO906 CO907 CO908 CO909 CO910 CO911 CO912 CO913 CO914 CO915 CO916 CO917 CO918 CO919 CO920 CO921 CO922 CO923 CO924 CO925 CO926 CO927 CO928 CO929 CO930 CO931 CO932 CO933 CO934 CO935 CO936 CO937 CO938 CO939 CO940 CO941 CO942 CO943 CO944 CO945 CO946 CO947 CO948 CO949 CO950 CO951 CO952 CO953 CO954 CO955 CO956 CO957 CO958 CO959 CO960 CO961 CO962 CO963 CO964 CO965 CO966 CO967 CO968 CO969 CO970 CO971 CO972 CO973 CO974 CO975 CO976 CO977 CO978 CO979 CO980 CO981 CO982 CO983 CO984 CO985 CO986 CO987 CO988 CO989 CO990 CO991 CO992 CO993 CO994 CO995 CO996 CO997 CO998 CO999 CO1000

Moment Tensor [Erc = 10²²]

$M_{11} = 0.00025e + 27$	$M_{12} = -4.00000e + 26$
$M_{13} = -8.00027e + 27$	$M_{22} = 7.00040e + 26$
$M_{21} = -8.02037e + 26$	$M_{23} = 2.77661e + 27$

Principal Axis

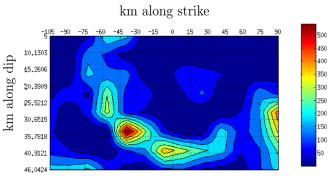
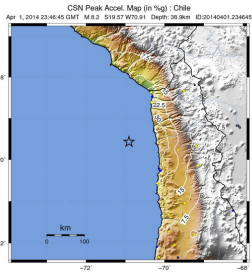
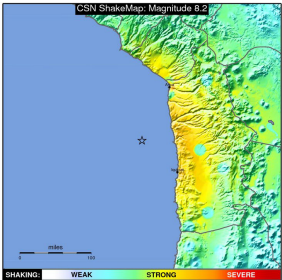
T = 2.55118	N = 0.05549	P = -2.38659
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Best Double Couple

	$M_0 = 0.3729e + 28$		
NP1:	$\phi = 345.3$	$\delta = 110$	$\lambda = 90.0$
NP2:	$\phi = 159.1$	$\delta = 75.1$	$\lambda = 90.1$



¹Workshop at CSN by Sebastian Ripstein, Downloaded by Hiron Kawanami and Luis Reyes



- Wphase Moment Tensor
- Regional Moment Tensor
- Earthquake Catalog
- Wphase Finite Fault Model
- Teleseismic Finite Fault Model
- Shakemaps