



Sea Level CCI project Phase II 1st annual review Outreach and Promotion

Jean-François Legeais, (CLS)
Sabrina Mbajon Njiche, Gary Timms (CGI)





Overview:

- Conferences
- Newsletters
- Publications
- Website
- User access



The SL_cci project has been promoted at different international conferences:

- **EGU**, April 27th, Vienna: => poster available on the SLCCI website
- **COSPAR**, Aug. 2nd, Moscow: => talk
- **Eumetsat conference**, Sept, 22nd, Geneva: => poster
- **Climate Symposium**, Oct. 13th, Darmstadt:
 - ⇒ SL_cci project **poster**
 - ⇒ **talk** about Arctic and sea level change (**NERSC**)
 - ⇒ **poster** « Regional SL rise » (**TUD**)
- **OSTST/ Coastal altimetry**, Oct. 28th-31st, Constance Lake
 - ⇒ **talk** in plenary session of the SL_cci project (**Science Leader**, B. Meyssignac)
 - ⇒ **poster** about Global MSL uncertainties (**CLS**)
 - ⇒ **talk** about technical dev.: Rudenko et al. (**GFZ**)
 - ⇒ SL_cci **poster** about the Arctic ocean and MSS (**DTU + NOC**)
 - ⇒ SL_cci **poster** « waveform classification in Arctic » (**PML**)
 - ⇒ **talk** « coastal sea level » (**NOC + UPorto, PML, TUD**)
 - ⇒ **2 talks** « wet tropo correction for CS-2 » (**UPorto**)
 - ⇒ **poster** « wet tropo correction for SARAL/AltiKa » (**Uporto**)
 - ⇒ **poster** « Regional SL rise » (**TUD**)
- **AGU**, Dec. 15th, San Fransisco CA => **oral presentation**
- **ISSI**, Berne, 2-5 Feb. 2015: « Sea level and associated climate components at global & regional scales as inferred from the ESA Climate Change Initiative (CCI)»
Sea Level CCI – Phase II 1st annual review – Jan. 29th – 30th 2015



- 5th **newsletter**: published at the 2014 EGU meeting
- 6th **newsletter**: published at the AGU Fall meeting (Dec. 2014):

Overview:

- ⇒ Planning of the project
- ⇒ The SL ECV extension
- ⇒ Technical dev.: focus on the sea level estimation in Arctic
- ⇒ SL_cci promotion: publications and events (conferences)

- 7th **newsletter**: After the selection meeting?
Selected algorithms + ECV extension

The image shows a composite of three elements related to the SL_cci newsletter:

- Top Banner:** A blue banner with the text "climate change initiative" and a large white arrow pointing to "SEA LEVEL NEWSLETTER". The date "Issue 3 | November 2012" is visible in the bottom right corner.
- Left Panel:** A screenshot of a BBC News article titled "Satellites trace sea level change". The article includes a world map showing sea level rise with a "3mm" label and a color scale. Below the map, text states: "The release of the Sea Level CCI ECV, announced in conjunction with the Venice symposium in September 2012, had a significant impact across the media. (Image shows the BBC web site announcement). At least 30 articles were published all around Europe (and also in the USA)".
- Right Panel:** A screenshot of a mobile app interface showing a grid of satellite images of Earth. To the right of the app is a sidebar titled "In this issue:" with a list of topics:
 - Happy 2nd Birthday
 - The algorithm selection
 - Products generation and dissemination
 - Venice meetings
 - Coming events



The team has published or contributed to numerous **peer-reviewed papers** in 2014.

- **Cazenave A.**, Dieng H.B., **Meysignac B.**, von Schuckmann K. Decharme B. and Berthier E., The rate of sea level rise. Nature Climate Change, vol 4, 358-361, DOI: 10.1038/NCLIMATE2159, 2014.
- Couhert A.; L. Cerri; J.-F. **Legeais**; M. **Ablain**; N. Zelensky; B. Haines; F. Lemoine; W. Bertiger; S. Desai; M. Otten; Towards the 1 mm/y Stability of the Radial Orbit Error at Regional Scales, Advances in Space Research, 2014.
- Dieng, H.B., Palanisamy H., **Cazenave A.**, **Meysignac B.** and von Schuckmann K., The sea level budget since 2003; Inference on the deep ocean heat content, submitted Surveys in Geophysics, 2014.
- Feng, X., M. Tsimplis, G. **Quartly**, M. Yelland, 2014, Wave height analysis from 10 years of observations in the Norwegian Sea, Cont. Shelf. Res. 72, 47-56. doi: 10.1016/j.csr.2013.10.013
- Feng, X., M. Tsimplis, M. Yelland , G. **Quartly**, 2014, Changes in significant and maximum wave heights in the Norwegian Sea, Glob. Plan. Change. 114, 68-76. doi: 10.1016/j.gloplacha.2013.12.010
- Henry O., **Ablain M.**, **Meysignac B.**, **Cazenave A.**, Masters D., Nerem S., Leuliette E. and Garric G., Investigating and reducing differences between the satellite altimetry-based global mean sea level time series provided by different processing groups, J. of Geodesy, 88:351–361, doi: 10.1007/s00190-013-0687-3, 2014.
- J. A. **Johannessen**, R. P. Raj, J. E. Ø. Nilsen, T. Pripp, P. **Knudsen**, F. Counillon, D. **Stammer**, L. Bertino, O. B. **Andersen**, N. Serra and N. Koldunov (2014) Toward Improved Estimation of the Dynamic Topography and Ocean Circulation in the High Latitude and Arctic Ocean: The Importance of GOCE, Survey in Geophysics, Springer, DOI 10.1007/s10712-013-9270-y.
- **Legeais**, J.-F., **Ablain**, M., and Thao, S.: Evaluation of wet troposphere path delays from atmospheric reanalyses and radiometers and their impact on the altimeter sea level, Ocean Sci., 10, 893-905, doi:10.5194/os-10-893-2014, 2014.
- Palanisamy H., **Cazenave A.**, **Meysignac B.**, Soudarin L., Woppelmann G. and M. Becker, Regional sea level variability, total relative sea level rise and its impacts on islands and coastal zones of Indian Ocean over the last sixty years, Global Planetary Change, 2013,doi: 10.1016/j.gloplacha.2014.02.0001.
- Palanisamy, H. **Cazenave A.**, Delcroix T. and **Meysignac B.**, Spatial trend patterns in Pacific Ocean sea level during the altimetry era : the contribution of thermocline depth change and internal climate variability, Ocean Dynamics, in revision, 2014.
- **Rudenko**, S., Dettmering, D., Esselborn, S., Schöne, T., Förste, C., Lemoine, J.-M., Ablain, M., Alexandre, D., Neumayer, K.-H. (2014): Influence of time variable geopotential models on precise orbits of altimetry satellites, global and regional mean sea level trends. Advances in Space Research, in press, <http://dx.doi.org/10.1016/j.asr.2014.03.010>.



• **Conference proceedings and communication in 2014:**

- G. Larnicol, A.Cazenave, B. Meyssygnac, M. Ablain, J. Legeais, Y.Faugere, J.Johannessen, D.Stammer, G.Timms, P.Knudsen, P.Cipollini, M.Roca, S.Rudenko, J.Fernandes, M.Balmaseda, G. Quartly, L. Fenoglio, J.Benveniste, B.M. Lucas, S. Dinardo, T. Guinle (2014) Sea Level CCI Phase 1 results and Phase 2 Activities, COSPAR, Moscow, Russia, 2-10 August, 2014.
- G. Larnicol, JF Legeais, M. Ablain, A. Cazenave, Benoît Meyssignac, D. Stammer, M. Scharffenberg, J. Johannessen, G. Timms, S. Rudenko, M. Roca, O. Andersen, P. Cipollini, M. Balmaseda, J. Fernandes, G. Quartly, Luciana-Fenoglio-Marc, J. Benveniste, B. Lucas, S. Dinardo and T. Guinle (2014) Accurately measuring sea level change from space: an ESA Climate Change Initiative, Eumetsat meteorological satellites conference, Geneva, Switzerland, 22-26 September, 2014.
- M. Ablain, L. Zawadzki, A. Cazenave, B. Meyssignac (2014) Confidence envelop of the Global MSL time-series deduced from Jason-1 and Jason-2 altimetric missions, 5th collocation meeting, ESRIN, Frascati, Italy, 20-22 October, 2014.
- Scharffenberg M. G., A. Köhl, D. Stammer (2014) Sea Level ECV Quality Assessment via Global Ocean Model Assimilation, Ocean Surface Topography Science Team Meeting (OSTST) - New frontiers of altimetry, Konstanz, Germany, 27-31 October, 2014.
- Rudenko et al. (2014) Investigation of long-term stability of precise orbits of altimetry satellites, OSTST, Konstanz, Germany, 27-31 October, 2014.
- A. Kurekin, D. Knappett, G. Quartly (2014) Improved waveform classification in the Arctic, OSTST, Konstanz, Germany, 27-31 October, 2014.
- J. Fernandes, C. Lázaro, A. L. Nunes, N. Pires (2014) New frontiers of altimetry, OSTST, Konstanz, Germany, 27-31 October, 2014.
- P. Cipollini et al (2014) Climate-quality estimates of sea level in the coastal zone from the ESA Climate Change Initiative Sea Level Project, 8th Coastal Altimetry Workshop, Lake Constance, Germany, 23-24 October, 2014.
- L. Fenoglio-Marc, S. Dangendorf, M. Becker, J. Jensen, T. Wahl, G. Sannino (2014) Regional Sea Level Rise in the North Sea and Mediterranean basins, OSTST, Konstanz, Germany, 23-24 October 2014 and the Climate Symposium, Darmstadt, Germany, 13-17 October, 2014.
- J. A. Johannessen (2014) High latitude Seas and Arctic Ocean Sea Level change - observation requirements, simulation capabilities, forward projections and challenges, Climate Symposium, Darmstadt, Germany, 13-17 October, 2014.
- G. Larnicol, JF Legeais, M. Ablain, A. Cazenave, Benoît Meyssignac, D. Stammer, M. Scharffenberg, J. Johannessen, G. Timms, S. Rudenko, M. Roca, O. Andersen, P. Cipollini, M. Balmaseda, J. Fernandes, G. Quartly, Luciana-Fenoglio-Marc, J. Benveniste, B. Lucas, S. Dinardo and T. Guinle (2014) Accurately measuring sea level change from space: an ESA Climate Change Initiative, Climate Symposium, Darmstadt, Germany, 13-17 October, 2014.
- L.Fenoglio, S. Dinardo, R. Scharroo, C. Buchhaupt, B. Lucas, M. Renesto, J. Benveniste (2014) Coastal CRYOSAT-2 data in SAR Mode in the German Bight Area, 8th Coastal Altimetry Workshop, Lake Constance, Germany, 23-24 October, 2014.
- J. Fernandes, C. Lázaro, A. L. Nunes, N. Pires (2014) DComb wet tropospheric correction for CryoSat-2 over open and coastal ocean, 8th Coastal Altimetry Workshop, Lake Constance, Germany, 23-24 October, 2014.
- J. Benveniste, G. Gilles, A. Cazenave, M. Ablain, JF. Legeais, Y. Faugère, B. Lucas, S. Dinardo, J A. Johannessen, D. Stammer, G. Timms, P. Knudsen, P. Cipollini, M. Roca, S. Rudenko, J. Fernandes, M. Balmaseda, G. Quartly, L. Fenoglio-Marc, T. Guinle, B. Messignac (2014) Two Decades of Global and Regional Sea Level Observations from the ESA Climate Change Initiative Project, AGU, San-Francisco, USA, 15-19 December, 2014.
- E. Fagiolini, H. Dobslaw, S. Rudenko and F. Flechtner (2014) Backward extension to 1976 of RL05 GRACE Atmosphere and Ocean De-aliasing Level-1B (AOD1B) product and its validation, AGU, San-Francisco, USA, 15-19 December, 2014.
- Larnicol, G., Cazenave, A., Ablain, M., Legeais, J.-F., Faugere, Y., Benveniste, J., Lucas, B., Dinardo, S., Johannessen, J., Stammer, D., Timms, G., Knudsen, P., Cipollini, P., Roca, M., Rudenko, S., Fernandes, J., Balmaseda, M., Guinle T. Two Decades of Global and Regional Sea Level Observation from the ESA Climate Change Initiative Sea Level Project, Geophysical Research Abstracts, vol. 16, EGU2014-7675, European Geosciences Union General Assembly 2014, Vienna, Austria.
- Rudenko, S., Dettmering, D., Esselborn, S., Schöne, T., Förste, Ch., Lemoine, J.-M., Neumayer, K.-H. Impact of time variable Earth global gravity field models on precise orbits of altimetry satellites, global and regional mean sea level trends, Geophysical Research Abstracts, vol. 16, EGU2014-2238, European Geosciences Union General Assembly 2014, Vienna, Austria.



- **The list of papers is updated on the SL_cci website**

- **Peer-reviewed papers** in 2015:

- R.P.Raj, L.Chafik, J. E.Ø. Nilsen, T. Eldevik, I. Halo. (2015a), The Lofoten Vortex of the Nordic Seas. DSR I, 96, pp:1-14, <http://dx.doi.org/10.1016/j.dsr.2014.10.011>.

- R.P.Raj, J. A. Johannessen, J. E.Ø. Nilsen, I. Halo. (2015b), Quantifying mesoscale eddies of the Lofoten Basin. In prep.

- Esselborn, S., Schöne, T., Rudenko, S. Impact of time variable gravity on annual sea level variability from altimetry, the IAG Symposia Series Proceedings of the IAG Scientific Assembly 2013, in press.

- Ablain, M., Cazenave, A., Larnicol, G., Balmaseda, M., Cipollini, P., Faugère, Y., Fernandes, M. J., Henry, O., Johannessen, J. A., Knudsen, P., Andersen, O., Legeais, J., Meyssignac, B., Picot, N., Roca, M., Rudenko, S., Scharffenberg, M. G., Stammer, D., Timms, G., and Benveniste, J.: Improved sea level record over the satellite altimetry era (1993–2010) from the Climate Change Initiative project, *Ocean Sci.*, 11, 67-82, doi:10.5194/os-11-67-2015, 2015.

- **Papers to be submitted:**

- Using ERA-interim reanalysis to improve the pressure derived corrections for altimetry. L Carrere, Y. Faugere, M. Ablain

- Fernandes et al. : A combined wet tropospheric correction for climate applications, J. Fernandes et al. (UoP)

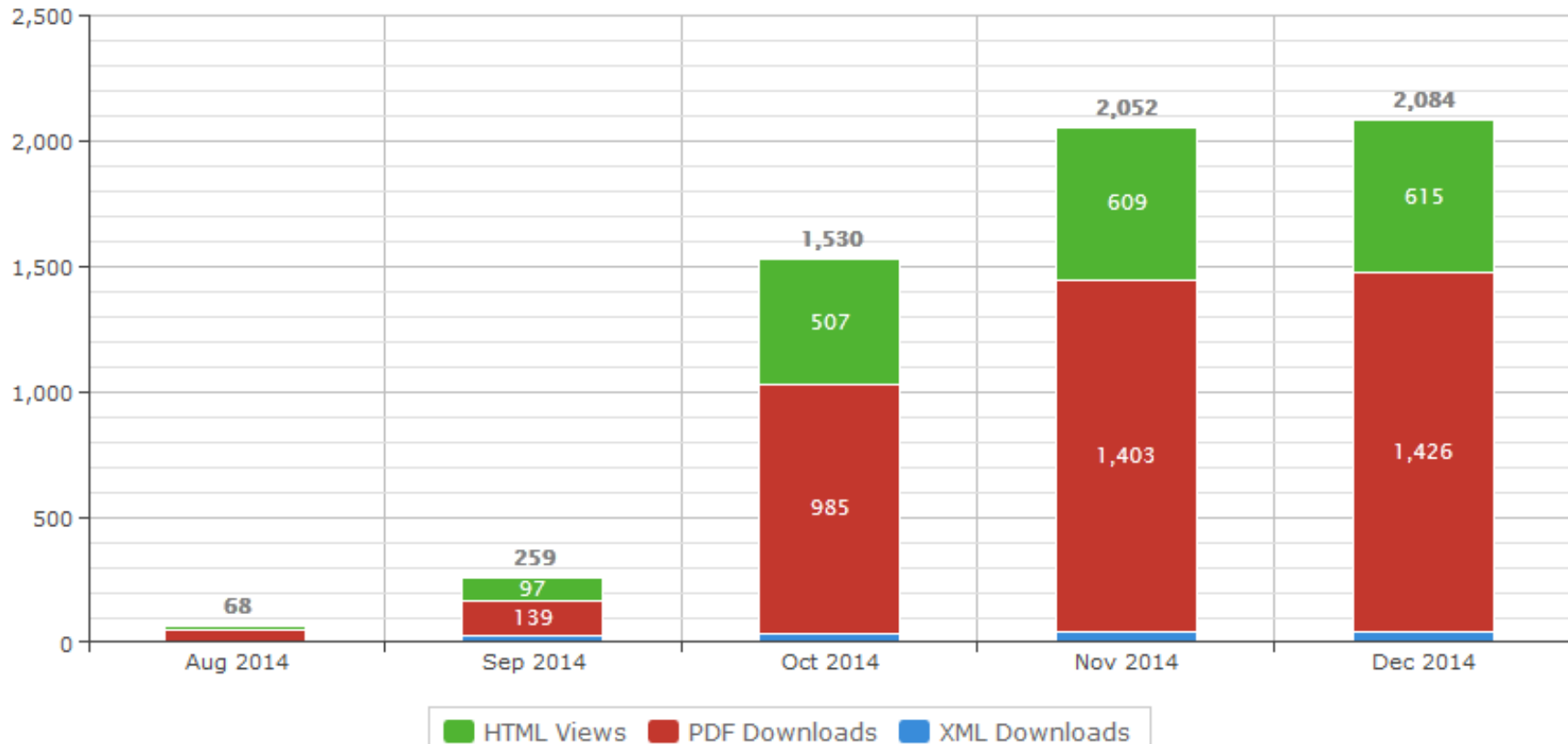
Outreach and promotion

Scientific publications



Ablain et al., Improved sea level record over the satellite altimetry era (1993–2010) from the Climate Change Initiative project, *Ocean Sci.*, 11, 67-82, doi:10.5194/os-11-67-2015, 2015.

Cumulative Views and Downloads (calculated since 21 Aug 2014, article published on 21 Aug 2014)



=> 160 views and download in 10 days in January (13-23 Jan. 2015)
 Sea Level CCI – Phase II 1st annual review – Jan. 29th – 30th 2015



Project website:

⇒ An **overall refresh** has been performed at the beginning of phase II (2014)

- **Communication** on: <http://www.esa-sealevel-cci.org/>
 - the availability of the v1.1 temporal extension
 - the availability of the along-track altimeter measurements of all missions (data already provided to the CRG)
- **Regular upload** of all **deliverables** – maintaining only current versions on the website, with checks that accurate document description metadata has been updated to show the full (long) name of each document.
- Upload of the updated **list of publications** of the team
- Upload of **presentations/posters** from the team at external meetings & conferences.
- Calendar updated with **upcoming events** (internal & external)
- **Transfer of the website hosting** (CLS/CGI): the transfer is now completed.



Project website: <http://www.esa-sealevel-cci.org/>

⇒ Statistics on the access of the webpages (Daily Averages for December & Most popular pages.

Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Dec 2014	448	901	2,469	4,930	785.72 MB
Daily Average	0	29	79	159	25.35 MB

415 different pages-url	Viewed	Average size	Entry	Exit
/	446	18.07 KB	251	148
/rss.xml	291	12.56 KB	278	204
/node/1 (ESA CCI)	95	16.73 KB	64	66
/webfm_send/194 (CMUG Meeting)	92	125.41 KB	3	35
/frontpage	77			73
/PublicDocuments	44	81.75 KB	5	13
/Sea%20Level%20information	41	18.59 KB	11	12
/node/177 (Publications)	37	86.04 KB	17	19
/node/194 (CMUG Meeting)	33	13.88 KB	1	6
/webfm_send/238 (CAR)	32	9.61 MB		1
/project%20team	24	17.78 KB	8	10
/products	23	14.78 KB	3	3
/node/188 (v1.1 product news item)	22	13.63 KB		3
/node/139 (newsletters)	21	14.65 KB		
/participants	19	13.07 KB	2	2
/information	18	14.68 KB	3	2

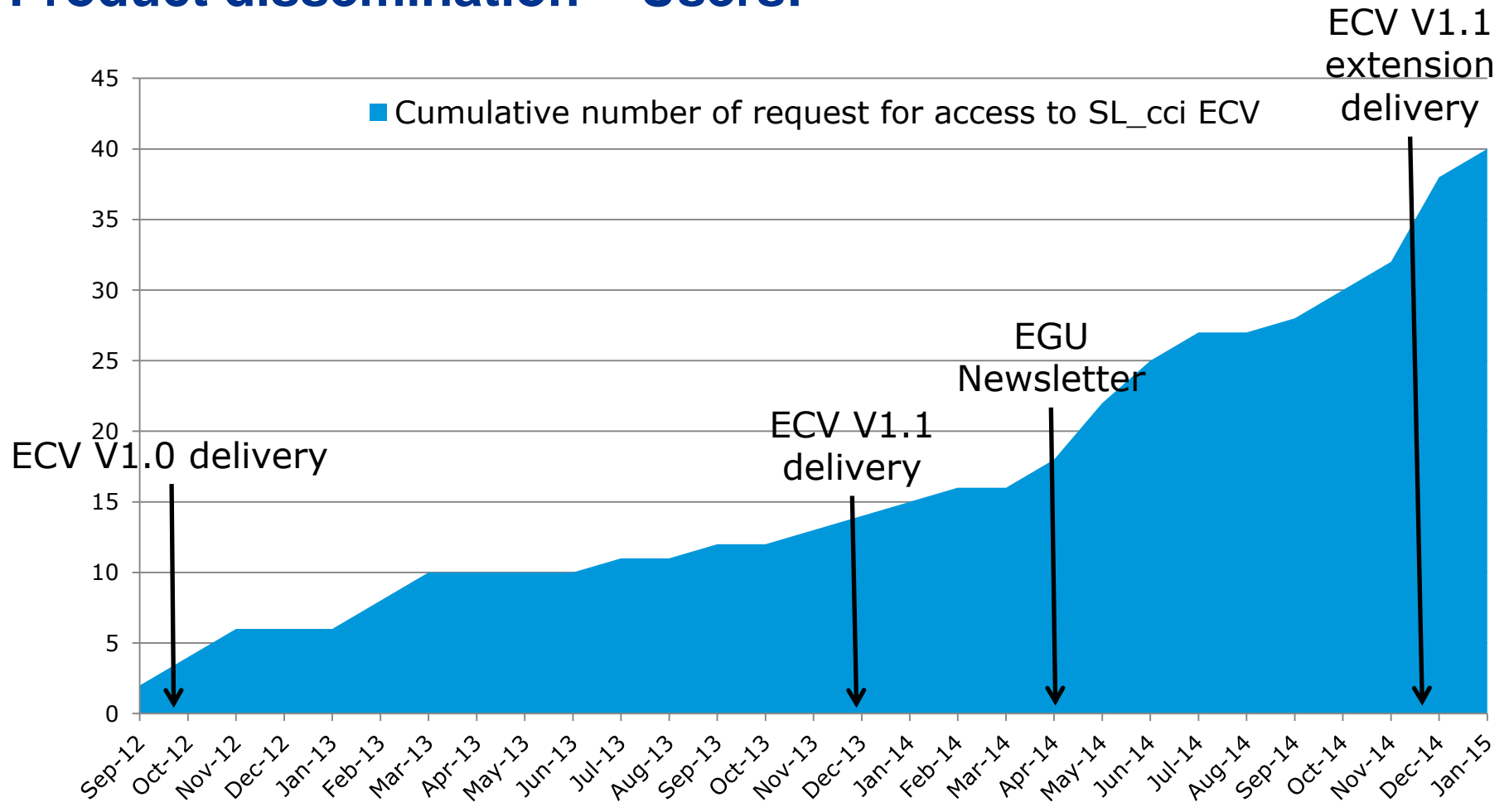


Product dissemination – Users:

- **Unique e-mail address:** info-sealevel@esa-sealevel-cci.org
 - ⇒ ESA is included
- **Managed by the altimetry service desk team at CLS**
 - Direct answer
 - Redirection to the appropriate expert for the more technical questions (within CLS or outside)
 - Reporting
- **Promotion of the SL ECV extension (Dec. 2014):** web news, newsletter and emails to:
 - ESA
 - Science leaders and Project managers of other ECVs
 - Data Standard and System Engineering WkGps



Product dissemination – Users:





Conclusions:

- International conferences:
 - ⇒ Many contributions in 2014
- Newsletters:
 - ⇒ 2 newsletters published in 2014!
- Publications:
 - ⇒ Project publication: very high level reached in terms of number of access!
- Website:
 - ⇒ Transfer of the hosting and regular update of the information
- User access
 - ⇒ The promotion seems to affect the user access