International Commission on Stratigraphy

SUBCOMMISSION ON CRETACEOUS STRATIGRAPHY

ANNUAL REPORT **2012**

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

International Subcommission on Cretaceous Stratigraphy (SCS)

SUBMITTED BY
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2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

- *To facilitate international communication in all aspects of Cretaceous stratigraphy and correlation*
- *To establish a standard global stratigraphic subdivision and nomenclature for the Cretaceous, as part of the ICS standard global stratigraphic scale;*
- *To produce a stratigraphic table displaying agreed subdivision to substage level and intervals of disagreement, marking boundaries that are defined by a GSSP.*

3. ORGANIZATION

SCS is a Subcommission of the International Commission on Stratigraphy.

Membership:	Chair:	Prof. Malcolm Hart, UK
	Vice Chairs:	Dr. James Haggart, Canada
		Dr. Brian Huber, USA
	Secretary:	……

In addition, there are **18** Voting Members of the Subcommission, from most continents. Over 130 Cretaceous scientists from all over the world and in many different disciplines belong to one or more of the 9 Stage Working Groups of the SCS still active, or to the Kilian Group. All WG members are treated as Corresponding Members of the Subcommission. Effectively, anyone with interest and expertise that can contribute to our objectives is welcome to do so. ***The great bulk of the***

Subcommission's work is carried out by these Working Groups.

3a. Officers for 2012-2016:

Chair:	Prof. Malcolm Hart (Plymouth, UK)
Vice-Chairs:	Dr. James Haggart (Canada)
	Dr. Brian Huber (Washington D.C., USA)
Secretary:	***to be nominated***

Thanks to Silvia Gardin, former secretary, the WEB site of the Cretaceous Subcommission is still active at < http://www2.mnhn.fr/hdt203/info/iscs.php> *and can be reached also through the ICS web site*.

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

The Subcommission has liaised with successive meetings of the *International Cretaceous Symposium*, which until 2004 have been promoted by the German *Subkommission für Kreide-Stratigraphie*. The SCS has since taken over the responsability for selection of future venues, though the successful applicants will organize individual congresses. As it was decided at the *8th International Symposium on Cretaceous System*, held in Plymouth in September 2009, the *9th International Symposium on Cretaceous System* will be convened in 2013 at Ankara, Turkey. The Symposium is now scheduled for 1-5 September 2013 and will be hosted by the Middle East Technical University in Ankara. For up-dated informations visit the WebSite http://www.cretaceous2013.org/en/. Contact Person: Ass. Prof. Dr. Ismail Omer Yilmaz <ioyilmaz@metu.edu.tr>.

The Subcommission also liaises closely with the Subcommission on Jurassic Stratigraphy, especially over the definition of the Jurassic/Cretaceous boundary.

The Subcommission had strong liaisons also with IGCP projects, IGCP 507 – "Cretaceous paleoclimatology", and IGCP Project 506 - Marine and Non-marine Jurassic: Global correlation and major geological events (Project Co-Leader W. Wimbledon).

SCS has always been directly or indirectly linked to important international Projects such as IODP, IGCP, CHRONOS (Mesozoic Planktonic Foraminifera Working Group, MPFWG), EARTH TIME EUROPE (ESF-European Science Fundation), and ICDP (International Continental Scientific Drilling Project).

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2012

General Activities

The chair of the Cretaceous Subcommission called for the election of its chair and vice-chair(s) in fall 2011. As several nominations have been received, the procedure was completed by the end of 2011. **The results have been forwarded to ICS Executive for approval in January 2012.** In addition, the former Chair (I. Premoli Silva) called for the elections of new Voting Members of the Subcommission for the 2012-2016 term**.** After having received thirteen nominations, the current Voting Members **have voted, thus elected, 8 new members** by the end of October 2012 (see below).

A wealth of data on various aspects of Cretaceous stratigraphy had continued to be published in 2012 providing a continuous amelioration of the multiple stratigraphic framework that today spans

the whole Cretaceous in increasing higher resolution.

Increasing knowledge on carbon isotope stratigraphic patterns and magnetostratigraphy from continuous pelagic successions, especially deep-sea, through the Cretaceous, provoked an increase of interest in the scientific community for a more traditional stratigraphic aspects. In 2012 this resulted in an increase of activities among the ammonite specialists as well as on other fossil groups and other proxie tools. In particular, the Cretaceous Subcommission members have been very active in revising ammonite taxonomy and stratigraphic distribution of key taxa; and field trips to solve specific topics have been organized visiting some key sections (i.e. Albian, Berriasian type-area, etc.). In addition, the Berriasian Working Group called two official meetings in Spring (Biserte, Tunisia) and Autumn (Prague), and its chair organized a field trip to Irak in September 2012 plus few visit to the Ukrainian sections. Important Cretaceous issues have been considered also by the ICDP, within which coring was undertaken on Cretaceous-age Songliao Basin (northeastern China) in the aim to recover a nearly complete Cretaceous terrestrial sedimentary record. The first results of the multidisciplinary study are now on-line (see below).

Z. Feng, C. Wang, S. Graham, C. Koeberl, H. Dong, Y. Huang, Y. Gao, 2012. Continental Scientific Drilling Project of Cretaceous Songliao Basin: Scientific objectives and drilling technology Palaeogeography, Palaeoclimatology, Palaeoecology, on-line.

C.P. Chamberlain, X. Wan, S.A. Graham, A.R. Carroll, A.C. Doebbert, B.B. Sageman, P. Blisniuk, M.L. Kent-Corson, Z. Wang, C. Wang, 2012. Stable isotopic evidence for climate and basin evolution of the Late Cretaceous Songliao basin, China. Palaeogeography, Palaeoclimatology, Palaeoecology, on-line.

C.L. Deng, H.Y. He, Y.X. Pan, R.X. Zhu, 2012. Chronology of the terrestrial Upper Cretaceous in the Songliao Basin, northeast Asia. Palaeogeography, Palaeoclimatology, Palaeoecology, on-line.

C. Wang, Z. Feng, L. Zhang, Y. Huang, K. Cao, P. Wang, B. Zhao, 2012. Cretaceous paleogeography and paleoclimate and the setting of SKI borehole sites in Songliao Basin, northeast China. Palaeogeography, Palaeoclimatology, Palaeoecology, on-line.

H. Wu, S. Zhang, G. Jiang, L. Hinnov, T. Yang, H. Li, X. Wan, C. Wang, 2012. Astrochronology of the Early Turonian–Early Campanian terrestrial succession in the Songliao Basin, northeastern China and its implication for long-period behavior of the Solar System Palaeogeography, Palaeoclimatology, Palaeoecology, on-line.

Of general interest:

Fernando A.G.S., Nishi H., Tanabe K., Moriya K., Iba Y., Kodama K., Murphy M.A., Hokada H., 2011. Calcareous nannofossil biostratigraphic study of forearc basin sediments: Lower to Upper Cretaceous Budden Canyon Formation (Great Valley Group), northern California, USA. Island Arc 20, 346–370.

K. B. Foellmi, M. Bole, N. Jammet, P. Froidevaux, A. Godet, S. Bodin, T. Adatte, V. Matera, D. Fleitmann,J. E. Spangenberg, 2012**.** Bridging the Faraoni and Selli oceanic anoxic events: late Hauterivian to early Aptian dysaerobic to anaerobic phases in the Tethys. Climate of the Past 8, 171–189.

O. Friedrich, R.D. Norris, J. Erbacher, 2012. Evolution of middle to Late Cretaceous oceans—A 55 m.y. record of Earth's temperature and carbon cycle. Geology 40/2, 107-110.

Y. Huang, G. Yang, C. Wang, H. Wu, 2012. The stabilisation of the long-term Cretaceous greenhouse climate: Contribution from the semi-periodical burial of phosphorus in the ocean. Cretaceous Research 38, 7-15.

G.D. Price, I. F**ő**zy, N.M.M. Janssen, J. Pálfy, 2011. Late Valanginian–Barremian (Early Cretaceous) palaeotemperatures inferred from belemnite stable isotope and Mg/Ca ratios from Bersek Quarry (Gerecse Mountains, Transdanubian Range, Hungary). Palaeogeography, Palaeoclimatology, Palaeoecology 305, 1–9

G.D. Price, T. Williamson, R.A. Henderson, M.K. Gagan, 2012. Barremian–Cenomanian palaeotemperatures for Australian seas based on new oxygen-isotope data from belemnite rostra. Palaeogeography, Palaeoclimatology, Palaeoecology 358–360, 27–39

S. Reboulet, F. Giraud, C. Colombié, A. Carpentier, 2012. Integrated stratigraphy of the Lower and Middle Cenomanian in a Tethyan section (Blieux, southeast France) and correlations with Boreal basins. Cretaceous Research, 20 p., on-line.

L. Simone, S. Bravi, G. Carannante, I. Masucci, F. Pomoni-Papaioannou, 2012. Arid versus wet climatic evidence in the **"**middle Cretaceous**"** calcareous successions of the Southern Apennines (Italy). Cretaceous Research 36, 6-23

The Kilian Group (Lower Cretaceous Ammonite Working Group).

The Kilian Group confirmed the plans to have the next meeting in September 2013 at the 9°

International Symposium on the Cretaceous System in Ankara (Turkey). For the new meeting the Kilian Group is expected to focus on the Berriasian, Valanginian and Hauterivian stages and to calibrate different ammonite zonations of the Tethyan, Boreal and Austral realms with the "standard" Mediterranean region zonation.

The Berriasian GSSP and the J/K boundary.

This is a summary of progress for the Berriasian WG, written by the chair, W.A.P. Wimbledon.

MEETINGS

The spring meeting (May 2012) in Tunis was hosted by Mabrouk Boughdiri and colleagues, from the University of Bizerte, and was an opportunity to see sites on the southern side of Tethys. For the first time we also had first-hand discussion of developments in both north Africa and Argentina.

An excellent autumn meeting was held in Prague (25-29 October 2012), hosted by the Charles University and Geological Institute of the Czech Academy of Sciences. Thanks to Petr Pruner, Martin Kostak, Petr Schnabl, Stanislav Slechta and Kristyna Cizkova and their colleagues. WG members from as far away as Mexico and Novosibirsk made the long journey to Prague and we had a diverse discussion on Tethyan, Gondwanan, non-marine and boreal correlations, with twenty-five talks and posters presented.

WORKING GROUP ACTIVITY

A range of activities is listed below, geographically. At present activities are focussed on better documentation and improved calibration of stratigraphically useful markers and datums in the Tithonian/Berriasian boundary interval. The group's horizons broaden and we consider new geographical areas for multidisciplinary treatment. This means bringing integrated paleomagnetic and/or calpionellid/nannofossil studies to some areas for the very first time, e.g north Africa, Iraq, Mexico…..

Mexico - Riccardo Baraggan presented the latest results at Prague on the 'new' J/K Apulco site, and a publication on the locality, near to the formerly described site of Mazatapec, is in press (Barragan, Lopez, Rehakova). New ammonite and calpionellid evidence was discussed at Sofia and Prague. Nannofossils are being processed, and new ammonite finds assessed.

Spain - Rio Argos: new work on nannofossil and calpionellids (Casellato, Rehakova, Jamrichova) has been undertaken on samples from the *Jacobi* Subzone collected by Philip Hoedemaeker in past years. Some of the early calpionellid results were discussed in Prague: they are rather surprising.

Italy - In recent months Gloria Andreini has undertaken a revision of the calpionellid distribution and zonation at Torre de Busi.

France - Documentation of "template" sites for the *jacobi* and *grandis* subzones continues.

Le Chouet, Drome: completion of the first paper on Le Chouet (Reháková, Casellato, Halásová, Frau, Bulot, Grabowski, Sobien, Pruner, Schnabl, Čížková , Tchoumatchenco, Wimbledon) is imminent, describing the *Chitinoidella* – B, *jacobi* subzone interval, its nannofossil, calpionellid and ammonite biostratigraphy and magnetostratigraphy. More focussed publications are intended, including one to name several new ammonite taxa.

St Bertrands Spring, Drome: initial logging and sampling for paleomagnetism (Pruner, Schnabl, Slechta, Grabowski); calponellids, nannofossils, ammonites (Frau, Bulot, Wimbledon) focussing on the nominal P. *grandis* subzone were carried out in May 2012. Preliminary determinations of paleomagnetism are currently in progress. The next step is a second phase of logging and micropaleontological collecting of the lowermost Berriasian and topmost Tithonian.

Tunisia - Beni Kleb was the subject of a first J/K paleomagnetic sampling in May 2012 (by Petr Schnabl). These samples are currently being studied (Petr Pruner talk at Prague)**.** Initial reconnaissance sampling for nannofossils was undertaken in March 2012 at Jebel Rheouis, Beni Kleb and in central Tunisia at Sidi Kralif, near Sidi Bousid

Silvia Gardin has just reported that the Sidi Kralif samples have produced the first (and rich) Berriasian nannofossils to be found locally. This step forward was discussed at Prague. Work continues on Sidi Kralif and the other two sections. Kamel Maaloui is completing is study of the Sidi Kralif ammonites.

Slovakia - Further study continues on the Strapkova section (examined droning our Slovakia excursion), its micropaleontology and magnetostratigraphy (Michalik, Grabowski, Rehakova, Lintnerova, Halasova)

Bulgaria - The SW Bulgaria sites at Berende and Kopanitsa, with their marly successions, have been intensively studied for ammonites and calcareous nannofossils (Ivanov, Vyara Idakieva, Stoykova). First results were presented in Prague, with obvious correlations possible to both Crimea and Mediterranean Tethys.

Burlya, in NW Bulgaria, a carbonate succession (visited by the WG in 2011) is undergoing new paleomagnetic sampling on its Berriasian part (Grabowski, Schnabl, Sobien) in collaboration with Platon Tchoumatchenco and Iskra Lakova. Marin Ivanov and Vyara Idakieva have also been making fresh collections of ammonites.

Ukraine - Vladimir Arkad'ev has just published a substantial book on the "Mountain Crimea" Jurassic/Cretaceous, a very large accumulation of data. He and Andrey Guzhikov presented new data at Prague, plus tintinnid results by E. Platonov.

Vladimir Bakhmutov has been at the Feodosia Tithonian/Berriasian sections in October collecting new paleomagnetic data. Preliminary results were presented by him at the Sofia meeting, and these are currently being improved and updated. New results on the nannofossils of the Feodosia sections were also presented in Prague by Eva Halasova. This data will be integrated with already collated information on lithostratigraphy, nannofossils (Casellato), foraminifers (Daria Ivanova), calpionellids (Rehakova), ammonites (WAPW) and magnetostratigraphy, and a publication is anticipated in 2013.

Iran - Mohamed Bezaggagh presented important new data at Prague on typical Tethyan calpionellid biotas in the Shal and Kolur sequences of the Alborz chain of Iran.

Caucasus - Valery Vuks has been making a reconnaissance of prospective sections near the J/K boundary in the western Caucasus, collecting samples for micropaleontology.

India - Samples collected from limestones in Kutch (by Dr Pandey) are being processed in the hope of finding microfossils.

Tibet - Work continues, including efforts at trying to integrate past results (?Tith/?Berr.ammonites, Liu et al.) with more modern collecting for palynology (Li) and nannofossils and ammonites (Wan).

Russian Platform and Siberia - Important new work has been undertaken on the Nordvik section with a revision of paleomagnetic zonation. This work (by Bragin, Kazansky, Shurygin and Dzyuba) has M17r commencing in the *Chataetes chetae* Zone instead of the *Hecteroceras kochi* Zone.

In addition, Zanin, Zamirailova and Eder have just published an interesting new paper on presumed J/K calcareous nannofossils from the Bezhanov Formation (2012, Open Geology Journal 6, 25-31)

Vasily Mitta continues with his important work on ammonite biostratigraphy, notably on links from the Russian Platform to Tethys during the Berriasian, and happily was able to contribute to the Prague discussions.

Kurdistan - After a gap in research of 64 years, reconnaisance fieldwork in northern Iraq in July 2012 focussed on Tithonian/Berriasian Chia Gara limestone/marl successions in the Gara Anticline and at Banik, but examination of accessory sequences at Sargelu and Barzanja was also carried out. Logging of the two major sections was undertaken as the first requirement. Samples from Gara and Banik are currently under investigation by: Ibrahim Mohyaldin (geochemistry), Daniela Rehakova and Gloria Andreini (calpionellids), Kristalina Stoykova (calc. nannofossils), and Jim Riding and Ian Harding (palynomorphs).

Argentina - Hector Leanza and Alberto Riccardi are considering new possibilities for J/K profile studies. And, in the University of Buenos Aires, ammonite and nannoplankton biostratigraphy are

being applied to the new site of Las Loicas, where there are possibilities for geochronological results from interbedded tuffs (using TIMS, SHRIMP and Laser Ablation U/Pb on zircons). The team consists of Beatriz Aguirre-Urreta, Veronica Vennari (ammonites), Andra Concheyro, Marina Lescano (nannofossils), Victor Ramos (field geology/tectonics), and Marcio Pimentel (geochronology; Universidade Federal do Rio Grande do Soul, Brazil).

South Primorye - A new team undertook its first fieldwork near Vladivostok in early October 2012 (Valentina Markevich, Eugenia Bugdaeva, Viktor Nechaev, Sha Jingeng, Li Jianguo, and WAPW). Preliminary fieldwork on the coast of Ussuri Bay and adjacent sections was for the purposes of testing the usefulness of published local lithostratigraphy and of trying to locate fossiliferous horizons, notably those identified by Sey and Kalacheva and Konovalov and Konovalova. In particular, the intention was to localise examples of Tethyan berriasellids in a section with multiple *Buchia* horizons. The reputedly 600m-thick predominantly sandstone Chigan Formation is affected by a number of major faults which disrupt the sequence, as well as gabbroic intrusions. Work has been initiated on recording all stratigraphically significant past fossil finds and then it will be necessary to integrate these records with new observations made in the field.

North Primorye - The team from Novosibirsk (B.N. Shurygin, O.S. Urman & O.S. Dzyuba) have been extending their extensive studies in Siberia and making new studies on sites in the Russian far east in the Komsomolsk area, on sequences with common *Buchia* and very rare Tethyan ammonites.

California - A new team has been formed for field and laboratory study for the sections of the northern Great Valley of California, as follows: Melissa Grey (Canada) *Buchia*, Jennifer Galloway (Canada) palynology, Oksana Dzyuba (Russia) belemnites, and from USA Alex Barnard mapping/lithostratigraphy, Emile Pessagno radiolarians, and Kathleen Surpless (radiometric dating). Nannofossils have not yet been assigned. It is some decades since the nannofossil work of Bralower at Grindstone Creek and even longer since the work of Jones on *Buchia* in the Paskenta-Grindstone area. First fieldwork is scheduled for May 2013.

Greenland - Work continues on the east Greenland sequences. Peter Alsen and Stefan Piasecki talked at Prague about new results from sections in the Wollaston Forland and other areas, and improved palynomorph/ammonite correlation from there to other boreal regions, notably, for the first time, to the *S. primitivus* Zone of England. Consideration is being given to a next step of magnetostratigraphic sampling of cores on which an ammonite and palynological study has already been performed.

United Kingdom - Paleomagnetic sampling of the non-marine Purbeck Formation (Tithonian-Valanginian) of Dorset was discussed at Prague. The work in summer 2011 (Pruner, Slechta, Schnabl) is on the putative M19-M18 interval, an interval previously sampled for magnetostatigraphy (by Ogg et al.) but not conclusively and with much much less resolution. 300 samples were collected and are in the process of study.

FORTHCOMING MEETINGS

Perugia – *circa* May 25-28, 2013

Warsaw - October, 2013

Y-Q. Liu, Q. Ji, X-J. Jiang, H-W. Kuang, S. Ji, L-F. Gao, Z-G. Zhang, N. Peng, C-Xi Yuan, Xu-Ri Wang, H. Xu, 2012. UePb Zircon Ages of Early Cretaceous Volcanic Rocks in the Tethyan Himalaya at Yangzuoyong Co Lake, Nagarze, Southern Tibet, and Implications for the Jurassic/Cretaceous Boundary. Cretaceous Research, 12 p., on line.

Base Valanginian GSSP.

In the absence of magnetic signals in the Montbrun-les-Bains section, so far the primary candidate for the Valanginian GSSP, and in general in all the southern France successions, scientists from Spain suggest that the alternate sections near Caravaca (SE Spain) should be reconsidered by the WG. The detail synthesis of the biostratigraphic and magnetic events provided by Aguado et al. (2000) shows that the Spanish sections, especially the Caneda Luega, are the only ones in the world

where a direct correlation could be made between magnetic chrons and ammonite-nannos-calpionellid zones at this level. Meanwhile, Stephane Reboulet and colleagues are currently gathering new data at Montbrun-les-Bains (S. France) and, in addition, and undertaken the study with a multidisciplinary approach of the Vergol section, which has the advantage to comprise also the base of the upper Valanginian.

Barbarin N., Bonin A., Mattioli E., Pucéat E., Cappetta H., Gréselle B., Pittet B., Vennin E., Joachimski M., 2012. Evidence for a complex Valanginian nannoconid decline in the Vocontian basin (South East France). Marine Micropaleontology 84-85, 37–53.

Base Hauterivian GSSP.

Since October 2010 when Luc Bulot (chair of the WG) and I. Premoli Silva (SCS chair) started to assembling the data available so far on La Charce section (Drome, France), the major candidate for the Hauterivian GSSP, the draft of the proposal did not make any progress due to new problems, such as the need of new sampling for up-dating the nannofossil and planktonic foraminiferal distributions across the Valanginian/Hauterivian boundary. Moreover, the chair Luc Bulot was deeply involved on collecting and studying Berriasian ammonites from Le Chouet. Hopefully the Hauterivian GSSP proposal will be completed in 2013.

J. Mutterlose, M. Malkoc, S. Schouten, J.S. Sinninghe Damsté, 2012. Reconstruction of vertical temperature gradients in past oceans — Proxy data from the Hauterivian–early Barremian (Early Cretaceous) of the Boreal Realm. Palaeogeography, Palaeoclimatology, Palaeoecology 363–364, 135–143

Base Barremian GSSP.

This report, prepared by Peter Rawson (Chairman of the WG) and Miguel Company (ViceChair), is a summary of the formal proposal of the Río Argos section as GSSP of the Barremian stage, which will be submitted shortly to the Subcommission for approval.

1. Geographical and geological setting

The candidate section is located on the right bank of the River Argos, some 8 km west of Caravaca (SE Spain). From a geological point of view it belongs to the Subbetic Domain, which corresponds to the pelagic domain of the southern passive margin of the Iberian plate during the Alpine cycle (Triassic-Miocene). The analyzed interval of the section (beds 144 to 193) is 40 m thick and encompasses the uppermost Hauterivian (*Pseudothurmannia ohmi* Zone, with the *Ps. ohmi*, *Ps. mortilleti* and *Ps. picteti* Subzones) and the lowermost Barremian (*Taveraidiscus hugii* Zone, with the *T. hugii* and *Psilotissotia colombiana* Subzones). The lithological succession consists of a monotonous alternation of marls and marly limestones, belonging to the Miravetes Formation, only broken by the occurrence of a thin laminated black shale interval near the base of the section (bed 148), which represents the local equivalent of the Faraoni Level, a well-known organic-rich horizon that has been recognized within the uppermost Hauterivian sediments in several basins of the western Mediterranean Tethys.

Textural (mudstones mainly composed of calcareous nannofossil remains), macropalaeontological (assemblages largely dominated by ammonites), taphonomic (absence of reworking evidence) and paleoichnological (intense bioturbation dominated by *Zoophycos*, *Chondrites* and *Planolites*) features indicate that the Río Argos succession was deposited in a stable, distal, low-energy, deep-water sedimentary environment. Sedimentation seems to have been continuous throughout the studied interval, since no evidence of interruption or condensation has been detected.

2. Fossil record

2.1. Ammonites - The Río Argos section has provided a rich and diverse ammonite fauna, which has been the subject of several studies. We have collected more than one thousand specimens from the studied interval. All of them belong to Mediterranean taxa.

The primary marker event of the base of the Barremian stage (first occurrence of *Taveraidiscus hugii*) has been recorded in bed 171 (23 m above the base of the studied interval). Other significant bioevents that take place in this interval are the first occurrences of *Pseudothurmannia ohmi* (bed 144), *Pseudothurmannia mortilleti* and *Pseudothurmannia sarasini* (148), *Discoidellia favrei* (149), *Ps. picteti* (156), *Barremites* spp. (160), *Taveraidiscus intermedius* (170), *Psilotissotia chalmasi* (174), *Psilotissotia colombiana* (183), and *Kotetishvilia nicklesi* (193).

2.2. Foraminifera - Although foraminifera are present in all the samples studied, their abundance and degree of preservation varies throughout the section. The diversity of planktonic foraminifers is, in general, relatively low, whereas the benthic ones are more abundant and diverse.

Only few events have been recorded in the Río Argos section. Concerning the planktonic foraminifers, *Hedbergella roblesae* and *Hedbergella semielongata* appear in bed 138, and *Hedbergella similis* in bed 195. Among the benthic foraminifers, the first occurrences of *Dorothia praeoxycona*, *Gavelinella barremiana* and *Conorotalites aptiensis* have been recorded, respectively, in beds 130, 175 and 195.

2.3. Calcareous nannofossils - The calcareous nannofossils assemblages are mostly composed of cosmopolitan and Tethyan taxa, the dominant genera being *Watznaueria*, *Nannoconus* and *Micrantholitus*. All the interval studied corresponds to the Zone NC5. The most significant events recognized in the section are: the last occurrence of *Lithraphidites bollii* (which marks the base of Subzone NC5C, in bed 148), the first occurrence of typical forms of *Nannoconus circularis* (154) and the first occurrence of *Micrantholitus* sp 1 (194). The last occurrence of *Calcicalathina oblongata*, which defines the base of Subzone NC5D, takes place somewhat above the interval studied, within the *Kotetishvilia nicklesi* Zone.

3. Stable isotopes and organic matter

The $\delta^{13}C$ values vary between 0 and 1.75‰ throughout the section, reaching their maximum in a small positive excursion, preceded by a negative peak, at the base of the *Ps. mortilleti* Zone, coinciding with the aforementioned Faraoni Level. The values remain more or less stable, around 1‰, in the *Ps. picteti* Subzone and show a negative trend throughout the *T. hugii* Zone.

The total organic matter content is, in general, very low (0.13% on average). However, the dark laminated sediments of the Faraoni Level show significantly higher values, reaching 3.8%.

4. Cyclostratigraphy

A high-resolution cyclostratigraphic analysis from magnetic susceptibility signal has been performed in the Río Argos section. Its results allow us to assign a duration of 0.78 myr to the *Ps. ohmi* Zone and 0.57 myr to the *T. hugii* Zone. The duration of the Faraoni event is estimated as 100-150 kyr, and the base of the Barremian stage would be located 0.7 myr after the onset of this event. Similar results were obtained from the cyclostratigraphic analysis of clay mineralogy.

5. Magnetostratigraphy

The Cretaceous sediments of the Ríos Argos area are affected by a Neogene remagnetization that prevents any magnetostratigraphic analysis. Nevertheless, correlation by ammonite and isotope stratigraphy with the Gorgo a Cerbara section (central Italy) allows us to correlate the Hauterivian/Barremian boundary with the upper part of chron CM5n.

6. Protection

The Cretaceous outcrops of the Río Argos area are catalogued as Site of Geological Interest in the General Urban Development Plan of the municipality of Caravaca. We expect the next declaration of the Río Argos section as Palaeontological Zone, with the category of Heritage of Cultural Interest, according to the Law of Cultural Heritage of the Region of Murcia.

Publications relevant to the Hauterivian/Barremian boundary (2011-2012)

Archuby, F.M., Wilmsen, M., Leanza, H.A., 2011. Integrated stratigraphy of the Upper Hauterivian to Lower Barremian Agua de la Mula Member of the Agrio Formation, Neuquen Basin, Argentina. Acta Geologica Polonica 61, 1-26.

Company, M., Aguado, R., Baudin, F., Coccioni, R., Deconinck, J.F., Frontalini, F., Giusberti, L., Martinez, M., Moiroud, M., O'Dogherty, L., Pellenard, P., Rawson, P.F., Romero, G., Sandoval, J., Tavera, J.M., Weissert, H., 2011. La sección de río

Argos (Caravaca, Murcia), candidata a GSSP del límite Hauteriviense-Barremiense (Cretácico inferior). XXVII Jornadas de la Sociedad Española de Paleontología (Sabadell, 2011). Paleontologia i Evolució, memòria especial 5, 75-78.
Fernando, A.G.S., Nishi, H., Tanabe, K., Moriya, K., Iba,Y, Kodama, K., Murphy, M.A., Okada, H., 2011. Calcareous nannofossil biostratigraphic study of forearc basin sediments: Lower to Upper Cretaceous Budden Canyon Formation (Great Valley Group), northern California, USA. Island Arc 20, 346-370.
Föllmi, K.B., Bôle, M., Jammet, N., Froidevaux, P., Godet, A., Bodin, S., Adatte, T., Matera, V., Fleitmann, D., Spangenberg, J.E., 2012. Bridging the Faraoni and Selli oceanic anoxic events: late Hauterivian to early Aptian dysaerobic to anaerobic phases in the Tethys. Climate of the Past 8, 171-189.
Lukeneder, A., 2012. New biostratigraphic data on an Upper Hauterivian-Upper Barremian ammonite assemblage from the Dolomites (Southern Alps, Italy). Cretaceous Research 35, 1-21.
Martinez, M., Pellenard, P., Deconinck, J.F., Monna, F., Riquier, L., Boulila, S., Moiroud, M., Company, M., 2012. An orbital floating time scale of the Hauterivian/Barremian GSSP from a magnetic susceptibility signal (Rio Argos, Spain). Cretaceous Research 36, 106-115.
Price, G.D., Főzy, I., Janssen, N.M.M., Pálfy, J., 2011. Late Valanginian-Barremian (Early Cretaceous) palaeotemperatures inferred from belemnite stable isotope and Mg/Ca ratios from Bersek Quarry (Gerecse Mountains, Transdanubian Range, Hungary). Palaeogeography Palaeoclimatology Palaeoecology 305, 1-9.

Base Aptian GSSP.

A wealth of data have been collected and published on the Aptian stage in the last years by our French collegues on the stratotype sections of the Bedoulian and Gargasian substages including revised biostratigraphies, d13C curve and cyclostratigraphy. Although magnetic signature in the French stratotype sections cannot be detected, carbon isotope data allowed a precise correlation between the base of magnetic chron M0, recommended at the 1995 Brussels Meeting for identifying the base of the Aptian, and the Aptian basal ammonite *Deshayesites oglanlensis* Zone. The formal proposal of the Aptian GSSP at Gorgo a Cerbara (central Italy) is still pending.

A. Cherchi, R. Schroeder, 2012. The Praeorbitolina/Palorbitolinoides Association: an Aptian biostratigraphic key-interval at the southern margin of the Neo-Tethys. Cretaceous Research, 8 p., on-line.
M. Ivanov, V. Idakieva, 2012. Lower Aptian ammonite biostratigraphy and potential for further studies of OAE 1a in Bulgaria. Cretaceous Research, 23 p., on-line.
M.V. Kakabadze, I.M. Kakabadze, 2012. Biostratigraphy and interrelationship of the Lower and Middle Aptian (Cretaceous) sedimentary sequences in Georgia and adjacent regions of the Caucasus. Revue de Paléobiologie, Vol. spéc. 11, 103-111.
J-P. Masse, M. Fenerci-Masse, 2012. Stratigraphic updating and correlation of Late Barremian-Early Aptian Urgonian successions and their marly cover, in their type region (Orgon-Apt, SE France). Cretaceous Research, 12 p., on-line.
J.A. Moreno-Bedmar, M. Company, J. Sandoval, J.M. Tavera, T. Bover-Arnal, R. Salas, G. Delanoy, F.J.-M.R. Maurasse, R. Martinez, 2012. Lower Aptian ammonite and carbon isotope stratigraphy in the eastern Prebetic Domain (Betic Cordillera, southeastern Spain). Geologica Acta 10/4, 1-12 DOI:1 0.1344/105.000001752
Moullade M., Tronchetti G., Balme C., Mauroux P., 2012. A new upper Bedoulian section in the Aptian stratotypic area: Croagnes (5 km NW of Gargas, Vaucluse, SE France). Carnets de Géologie [Notebooks on Geology], Brest, Letter 2012/03 (**CG2012_L03**), p. 193-199.
M.L. Quijano, J-M. Castro, R.D. Pancost, G.A. de Gea, M. Najarro, R. Aguado, I. Rosales, J. Martín-Chivelet, 2012. Organic geochemistry, stable isotopes, and facies analysis of the Early Aptian OAE—New records from Spain (Western Tethys). Palaeogeography, Palaeoclimatology, Palaeoecology 365–366, 276–293.

Base Albian GSSP.

As reported in previuos reports, the formal proposal for the base Albian at Tartonne (SE France), prepared by J. Kennedy, never reached the quorum. Voting Members against the proposal commented that the change of lithofacies at the critical level (from marl to organic-rich laminated black shale), the regional/provincial distribution of the index-species *Leymeriella (L.) tardefurcata,* and the low stratigraphic value of ancillary markers (few, poorly diagnostic planktonic foraminifera; *Predicosphaera* taxonomic problems, etc.), made the Tartonne section unsuitable as the base Albian GSSP. In addition, the sampling across the Aptian/Albian boundary was considered at too low resolution not adequate for such critical interval and the proposed event (FO of *L. tardefurcata*) is poorly applicable to other sections, especially outside SE France.

In Spring 2010 members of the new Working Group, set up at Plymouth in 2009 (Paul Bown, coordinator), re-sampled at high resolution the Col de Pré-Guittard section, Kennedy's ancillary section near Tartonne. A multidisciplinary study of the new sample set was carried out during 2011 (work is still in progress) by members of the WG. One of the most important results concerns the planktonic foraminifera which display a major turnover across the Niveau Kilian, in correspondence with a 1‰o delta13C escursion. Petrizzo et al. (2012) reported that (1) the latest Aptian assemblage, dominated by few long-ranging *Hedbergella* and large-sized *Paraticinella* completely disappear near the base of the Niveau Kilian organic-rich level, (2) planktonic foraminiferal assemblages from across the Niveau Kilian to the top of the studied section are composed of minute, but very distinctive smooth-surfaced species of *Microhedbergella miniglobularis* and *Mi. renilaevis*, (3) the appearance of *Mi. renilaevis* in the middle part of the Niveau Kilian represents a major step in the evolution and diversification of the Albian planktonic fauna. The same sequence of events was reported from several deep-sea sites in the Atlantic and Indian Oceans (Huber & Leckie, 2011). Therefore, documentation of the planktonic foraminiferal turnover, combined with the carbon-isotope stratigraphy in the Col de Pré-Guittard section, provide new criteria, replacing the FO of the unsuitable *L. tardefurcata*, for defining the GSSP for base Albian in a stratigraphically complete succession. The formal proposal dealing with the new criteria for identifying the base Albian is in preparation and is expected to be circulated during 2013.

Huber B.T., Leckie R. M., 2011. Planktic foraminiferal species turnover across deep-sea Aptian/Albian boundary sections. Journal of Foraminiferal Research 41, 53–95

Petrizzo M.R., Huber B.T., Gale A.S., Barchetta A., Jenkyns H.C, 2012. Abrupt planktic foraminiferal turnover across the Niveau Kilian at Col de Pré-Guittard (Vocontian Basin, southeast France): new criteria for defining the Aptian/Albian boundary. Newsletter on Stratigraphy, v. 45/1, pp. 55-74.

C. Peybernes, F. Giraud, E. Jaillard, E. Robert, M. Masrour, M. Aoutem, N. Içame, 2012. Stratigraphic framework and calcareous nannofossil productivity of the Essaouira-Agadir Basin (Morocco) during the Aptian-Early Albian: Comparison with the north-Tethyan margin. Cretaceous Research, 21 p., on-line.

Base Coniacian GSSP.

The main paper describing the criteria for identifying the base Coniacian and the proposal of a candidate composite GSSP section was published in Acta Geologica Polonica at the end of 2010. Besides multiple up-dated biostratigraphies, the paper also includes the isotope curves for both the Salzgitter-Salder (northern Germany) and Slupia Nadbrze~na (central Poland) sections. It is confirmed that the inoceramid-based lower Coniacian boundary (= first appearance of *C. deformis erectus*), slightly post-dates the traditional ammonite (FAD of *Forresteria petrocoriensis*) position of the boundary.

In September 2011 the chair of the WG, Irek Walaszczyk, circulated the published proposal to the Working Group members asking for comments and eventual approval. For the time being all replies, received so far, support the proposal of having a composite section as a base Coniacian GSSP. Although it is not an ideal choice, there is not a single perfect section which satisfies the GSSP for the base of the Coniacian. The formal proposal to be submitted to the Voting Members of the Subcommission is in advanced preparation by the WG chair.

I. Walaszczyk, C. J. Wood, J. A. Lees, D. Peryt, S. Voigt & F. Wiese, 2010. Salzgitter-Salder Quarry (Lower Saxony, Germany) – Slupia Nadbrzena river cliff section (central Poland): a proposed candidate composite Global Boundary Stratotype Section and Point for the Coniacian Stage (Upper Cretaceous). Acta Geologica Polonica, v. 60/3, 445-477.

Base Santonian GSSP.

The final proposal for the base Santonian at Olazagutia (Spain), prepared by the chair Marcos Lamolda, was distributed for approval and/or comments to the Voting Members of the Subcommission three times since 2008, and finally reached the quorum of positive votes in 2010. On

October 1, 2010 the proposal was returned to the WG chair for an up-date and few corrections. The final GSSP proposal was submitted to the ICS on 20 December 2010. On 29 May 2011 the Santonian GSSP proposal was circulated to the Commission Voting Members for comments. The proposal along with the comments was sent back to M. Lamolda on 8 July 2011 for corrections and editing. The final version was returned to ICS on 3 October 2011. The proposal for the base Santonian at Olazagutia (Spain) was approved by the ICS on 9th April 2012. Meanwhile, the quarry, in which the GSSP is located, has changed the ownership and the new owner in April 2012 denied the access even to the inactive part of the quarry, a fact that prevented to forward the proposal to IUGS for ratification. After several actions by ICS Chair, S. Finney, and the proponent, M. Lamolda, the owner changed his/her mind allowing the access at the inactive part of the quarry to scientists who have to fill and sign an application form for the visit. After having clarified the problem of access, the proposal can now be submitted to IUGS Ex for ratification.

Base Campanian GSSP.

Members of the WG have been searching for a new section across the Santonian/Campanian boundary to be proposed as base Campanian GSSP. So far, the only section not affected by hiatus and/or major dissolution is the Bottaccione section (Gubbio, central Italy), in which the calcareous plankton bioevents are calibrated to magnetostratigraphy. The distribution of planktonic Foraminifera across the Santonian-Campanian interval at Bottaccione was recently revised and up-dated (Petrizzo et al. 2011). Moreover, as the available carbon isotope stratigraphy was considered at too low resolution for reliable supraregional correlations, a new sets of carbon isotope analyses across the critical interval were undertaken by Silke Voigt on the original samples (Premoli Silva & Sliter 1995), calibrated to paleomagnetic scale, and on new samples collected at higher resolution along the same road section and on the opposite side of the valley by Gale and Voigt. A paper with the obtained carbon isotope curves correlated to that from Laegerdorf (N Germany) is ready to be submitted for publication. The main bias of the Bottaccione section is that planktonic foraminifera across the critical interval could not be properly disaggregated from the hard limestones, using cold acetolyse method, and are poorly preserved.

M.R. Petrizzo, F. Falzoni & I. Premoli Silva, 2011. Identification of the base of the lower-to-middle Campanian *Globotruncana ventricosa* Zone: Comments on reliability and global correlations. Cretaceous Research, v. 32, 387-405.

S. Bey, J. Kussa, I. Premoli Silva, M.H. Negrab, S. Gardin, 2012. Fault-controlled stratigraphy of the Late Cretaceous Abiod Formation at Ain Medheker (Northeast Tunisia). Cretaceous Research 34, 10-25.

Base Maastrichtian GSSP.

To overcome the problem of correlation between the GSSP and coeval sections, stable isotopes were measured in high resolution from Tercis les Bains GSSP (Thibault et al., 2012). In this paper the Tercis d13C isotope curve was successfully correlated to the isotope curves from two Danish Basin cores (DK), that could represent the standard carbon isotope curve for the Boreal realm being calibrated to the nannofossil and dynocyst biostratigraphies. Moreover, Gardin et al. (2012) revised the biostratigraphy of the Bottaccione section, already calibrated to magnetostratigraphy, and gathered new calcareous plankton biostratigraphic and magnetostratigraphic data of the upper Campanian-Maastrichtian interval form the nearby Contessa section (Gubbio, central Italy). In addition, both the Contessa and Bottaccione sections have been analysed for stable isotopes by Voigt (2012) who reconstructed carbon isotope curves for both sections and correlated them to her new isotope curve from the Tercis GSSP.

S. Gardin, B. Galbrun, N. Thibault, R. Coccioni, I. Premoli Silva, 2012. Bio-magnetochronology for the upper Campanian – Maastrichtian from the Gubbio area, Italy: new results from the Contessa Highway and Bottaccione

sections. Newsletters on Stratigraphy 45/1, 75–103.
M. Machalski, 2012. Stratigraphically important ammonites from the Campanian–Maastrichtian boundary interval of the Middle Vistula River section, central Poland. Acta Geologica Polonica 62/1, 91–116.
N. Thibault, R. Harlou, N. Schovsbo, P. Schiøler, F. Minoletti, B. Galbrun, B.W. Lauridsen, E. Sheldon, L. Stemmerik, F. Surlyk, 2012. Upper Campanian-Maastrichtian nannofossil biostratigraphy and high-resolution carbon-isotope stratigraphy of the Danish Basin: Towards a standard d13C curve for the Boreal Realm. Cretaceous Research 33, 72-90.
N. Thibault, D. Husson, R. Harlou, S. Gardin, B. Galbrun, E. Huret, F. Minoletti, 2012. Astronomical calibration of upper Campanian–Maastrichtian carbon isotope events and calcareous plankton biostratigraphy in the Indian Ocean (ODP Hole 762C): Implication for the age of the Campanian–Maastrichtian boundary. Palaeogeography, Palaeoclimatology, Palaeoecology 337–338, 52–71
S. Voigt, Gale A., Jung C., Jenkyns H., 2012. Global correlation of Upper Campanian - Maastrichtian successions using carbon isotope startigraphy: development of a new Maastrichtian timescale. Newsletters on Stratigraphy 45/1, 25–53.
P.D. Ward, J.W. Haggart, R. Mitchell, J.L. Kirschvink, T. Tobin, 2012. Integration of macrofossil biostratigraphy and magnetostratigraphy for the Pacific Coast Upper Cretaceous (Campanian–Maastrichtian) of North America and implications for correlation with the Western Interior and Tethys. GSA Bulletin 124 (5/6), 957–974.

6. CHIEF PROBLEMS ENCOUNTERED IN 2012

The need nowadays for a high-resolution framework to be exportable worlwide resulted in the necessity of re-visiting several candidate sections, already studied paleontologically, by implementing multiple biostratigraphies and stratigraphic tools other than fossils - those are profoundly affected by bioprovincialism in several intervals - like magnetostratigraphy, stable isotope stratigraphy, etc. In several cases, especially in the Late Cretaceous, the integration of multiple bio-, physical stratigraphies revealed that the candidate sections were unsuitable as GSSP. Consequently, new sections had to be searched and studied from the beginning. This resulted in a delay in submitting the GSSP proposals, taking also into account that scientists from different subdisciplines do not necessarily work at the same speed.

Another problem is the lack of fundings in most countries for carrying out studies strictly stratigraphic, apparently poorly fashionable, for attending workshops and/or conferences.

7. SUMMARY OF EXPENDITURES IN 2012 (ANTICIPATED THROUGH MARCH 2013):

I. INCOME

ICS subvention for 2012 (3000 $)	Euro	2370.74
Participation to 34th IGC, Brisbane (Chair) (2500$)	Euro	1975.26
Total income	Euro	**4346.00**

II. EXPENDITURE

34th IGC participation (Chair) Total cost (Registration-Air Ticket-Abstract)	Euro	3070.65
Contribution to J/K meeting in Bizerte (Tunisia)	Euro	1000.00
Contribution to J/K meeting in Prague+field work	Euro	900.00
Office (chair & secretary) expenses	Euro	50.00
Bank Expenses	Euro	24.67
Total expenditure	Euro	**5045.32**

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2013):

Membership of Cretaceous Subcommission.
Several Voting Members of the Cretaceous Subcommission had terminated their mandate with the 34th Geological Congress, August 2012. Call for nominations was completed in September 2012 and the new membership was completed by the end of October 2012.

Meetings

The 10° meeting of the Berriasian and J/K boundary WG is planned in Perugia (Italy), May 2013
Official Meeting of the Cretaceous Subcommission at the 9° International Symposium on Cretaceous System, Ankara, Turkey, September 2013.
5^{5h} Workshp of the Kilian Group at the 9th International Symposium on Cretaceous System, Ankara, September 2013
The 11° meeting of the Berriasian and J/K boundary WG in Warsaw, October 2013

Work Plan and anticipated Results

- To bring recommendations for the remaining GSSPs to ICS as soon as possible.
- Approval of the Santonian GSSP by IUGS Executive
- Votes on the Coniacian GSSP and submission to ICS after Subcommission approval
- Votes on the Hauterivian GSSP and submission to ICS after Subcommission approval
- Preparation of the first draft on Aptian GSSP
- To complete the study of the Col de Pré-Guittard section for the Albian GSSP, preparation of the formal proposal and submission to ICS after Subcommission approval
- Definition of criteria for identifying the base of the Berriasian and the J/K boundary
- Choose the appropriate section for the Campanian GSSP

9. BUDGET AND ICS COMPONENT FOR 2013

Office expenses (Fax, phone, postage, etc)	Euro	50
Contribution to the J/K Perugia Meeting (organization+ participants' support)		Euro 1500
Contribution to the J/K Warsaw Meeting (organization+ participants' support)	Euro	1500
Support to J/K field trips (i.e Ukraina, S France, others)	Euro	1500
Participation to 9th Cretaceous Symposium, Ankara (chair and others)	Euro	2000
Total estimated expenditure	**Euro**	**6550**

10. SUMMARY OF CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2008-2012)

See Accomplishments in ICS Annual Reports 2007 to 2011 (above) for additional details.

- Renewed research by WG members (resulting in a great number of publications, still ongoing), based on research needs pinpointed by the 1995 Brussels, 2005 Neuchâtel, 2008 Oslo, and 2009 Plymouth meetings.
- 3rd Workshop of the Kilian Group on the Hauterivian and Barremian zonation, held in Vienna (April 2008)
- 2nd official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Marseille (July 2008).
- 33° Geological Congress, August 2008, Olso: SCS Symposium on "Stratigraphic subdivisions of the Cretaceous System: State of the Art". (Conveners: I. Premoli Silva, F. Surlyk & I. Walaszczyk).
- 3rd official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Milan (March 2009).
- 4th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Plymouth (September 2009).
- 5th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Smolenice (Slovakia) (April 2010).
- 4th Workshop of the Kilian Group on the Aptian and Albian zonation, held in Dijon (August 2010).
- 6th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Paris (November 2010).
- 7th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Sofia (October 2011).
- 8th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Bizerte, Tunisia (May 2012).
- 9th official meeting of the Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Prague (October 2012).

The Chair and/or Vice Chair represented the SCS at:

2° meeting of the *Berriasian and J/K boundary Working Group*, Marseille, July 2008
SCS Symposium HPS-10 on "Stratigraphic subdivisions of the Cretaceous System: State of the Art". (Co-conveners: I. Premoli Silva, F. Surlik & I. Walaszczyk), at 33° Geological Congress, August 2008, Olso:
3° meeting of the *Berriasian and J/K boundary Working Group*, Milan, March 2009
4° meeting of the *Berriasian and J/K boundary Working Group*, Plymouth, September 2009
5° meeting of the *Berriasian and J/K boundary Working Group*, Smolenice, April 2010
ICS Meeting, Prague, May 2010
ICS official meeting, at 34° Geological Congress, August 2012, Brisbane

11. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2012-2016)

Meetings

- May 2012 – the 10th Workshop of the Berriasian and J/K boundary WG in Perugia, Italy
- September 2013 - Subcommission Official Meeting at the 9th International Symposium on Cretaceous System, Ankara
- September 1-5, 2013 – 9th International Symposium on Cretaceous System, Middle East Technical University, Ankara, Turkey. Convenor: Ismail Omer Yilmaz

- September 2013 – 5^{5h} Workshp of the Kilian Group at the 8th International Symposium on Cretaceous System, Ankara.
- October 2013 – the 11th Workshop of the Berriasian and J/K boundary WG in Warsaw, Poland

Details of other meetings are not yet available.

Objectives

- To submit the proposal of Santonian GSSP to Episodes for publication
- To submit the proposal of Coniacian GSSP to the Cretaceous Subcommission Voting Members, then submit it to ICS, and possibly to Episodes for publication
- To submit a new proposal of Albian GSSP to the Cretaceous Subcommission Voting Members, then to submit it to ICS, and possibly to Episodes for publication
- To submit the proposal of Barremian GSSP to the Cretaceous Subcommission Voting Members, then to submit it to ICS, and possibly to Episodes for publication
- To bring recommendations for the remaining GSSPs to ICS as soon as possibile
- To propose the definition of criteria for identifying the base of the Berriasian and the J/K boundary
- To communicate the results as widely as possible
- To develop new directions for the Subcommission as GSSP proposals are completed

Specifically, future objectives will concern the subdivision of stages, with definition of substages and related GSSPs.

Work Plan

2013 – Finalize the proposal for the base of the Albian
2013 - Finalize proposals for the base of Valanginian, Hauterivian, Barremian, Aptian, Coniacian, and possibly Campanian
2013-2014 - Finalize the proposal for the base of Berriasian (Jurassic/Cretaceous boundary)
2014 to 2006 – Definition of substages.

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APPENDIX ***[Names and Full Addresses of Current Officers and Voting Members]***

Subcommission officers (with addresses)

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Smithsonian Institution,
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Secretary: ??????

List of Voting Members

Prof. Evgenij Baraboshkin (Russia)	barabosh@geol.msu.ru
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Prof. David Watkins (USA)	dwatkins@unlserve.unl.edu
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List of Task Groups and their officers

Maastrichtian WG: *GSSP ratified.* Giles Odin, France. gilodin@moka.ccr.jussieu.fr
Campanian WG: Andy Gale (UK). Andy.Gale@port.ac.uk
Santonian WG: *GSSP under ratification*. Marcos Lamolda <gpplapam@lg.ehu.es>
Coniacian WG: Irek Walaszczyk, Poland. i.walaszczyk@uw.edu.pl
Turonian WG: *GSSP ratified*. No chairman at present.
Cenomanian WG: *GSSP ratified.* No chairman at present.
Albian WG: Malcolm Hart, UK. mhart@plymouth.ac.uk
Aptian WG: Elisabetta Erba, Italy. elisabetta.erba@unimi.it
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Valanginian WG: Luc Bulot, France. lucgbulot@aol.com
Berriasian (J/K boundary) WG: William A.P. Wimbledon, UK. newaberdon@tiscali.co.uk

Kilian Group *[formerly Lower Cretaceous ammonite WG]:*
Chairman: Stéphane Reboulet, France. stephane.reboulet@univ-lyon1.fr
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