

SUBCOMMISSION ON CRETACEOUS STRATIGRAPHY

ANNUAL REPORT 2009

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

International Subcommittee on Cretaceous Stratigraphy (SCS)

SUBMITTED BY

Prof. Isabella Premoli Silva, Chair

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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 Subcommittee of the International Commission on Stratigraphy.

Membership: Chair: Prof. Isabella Premoli Silva, Italy
Vice Chair: Dr. Irek Walaszczyk, Poland
Secretary: Dr. Silvia Gardin, France

In addition, there are 12 Voting Members of the Subcommittee, from all the continents (to be implemented). 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 Subcommittee. Effectively, anyone with interest and expertise that can contribute to our objectives is welcome to do so. *The great bulk of the Subcommittee's work is carried out by these Working Groups.*

3a. Officers for 2008-2012:

Chair:	Prof. Isabella Premoli Silva (Milan, Italy)
Vice-Chair:	Dr. Irek Walaszczyk (Warsaw, Poland)
Secretary:	Dr. Silvia Gardin (Paris, France)

The WEB site for the Subcommission is in preparation; its address will be <www.iscs.upmc.fr>

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 now taken over the responsibility for selection of future venues, though the successful applicants will organize individual congresses. At the *8th International Symposium on Cretaceous System* in September 2009, it was decided that the *9th International Symposium on Cretaceous System* will be convened in 2013 at Ankara, Turkey.

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

When appropriate, the Subcommission liaises also with IGCP projects. In particular, a strong liaison was established by our colleagues from IGCP 507 – “Cretaceous paleoclimatology”, and IGCP Project 506 - Marine and Non-marine Jurassic: Global correlation and major geological events (Project Co-Leader W. Wimbledon).

ICS has always been directly or indirectly linked to big international Projects as IODP, IGCP, and CHRONOS (Mesozoic Planktonic Foraminifera Working Group, MPFWG).

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2009

General Activities

The Subcommission on Cretaceous Stratigraphy was deeply involved at the *8th International Symposium on Cretaceous System* in Plymouth (6-12 September 2009) with two sessions dedicated to the “Cretaceous Stratigraphy and Stage Boundaries” and with a third session that concerned specifically “The Jurassic/Cretaceous Boundary”.

Out of the eleven presentations two emphasized the need for an integrated multidisciplinary approach to overcome the problems of “worldwide” applicability of the criteria chosen for identifying any GSSP. As an example of the validity of this approach it can be mentioned specifically the presentation on “A new integrated stratigraphy for the Albian Stage” by Gale and co-authors.

In fact, since 2005 (Neuchatel Cretaceous Symposium) none of the missing Cretaceous GSSPs have been ratified, even though the Santonian and Albian GSSP proposals have been circulated for approval.

From the numerous recent contributions, although most of them not specifically dedicated to Cretaceous GSSP sections, it clearly emerges that for global correlations there is a strong need for stratigraphic tools other than fossils, that frequently suffer a spacially limited distribution and too

many times are affected by remarkable bioprovincialism. Based on these works a solid integrated multiple stratigraphic framework is now available: carbon isotope stratigraphy from continuous pelagic successions provided by deep-sea drilling in all oceans and/or magnetostratigraphy turned out to be the best tools for long distance correlations.

A very well attended, **business meeting** of the Subcommittee was held at the end of the *8th International Symposium on Cretaceous System* (Plymouth) in the afternoon of September 12. The two hours meeting included (1) a brief presentation on the base Coniacian by Chris Wood for the GSSP of which it was proposed tentatively a composite section merging the data from the Salzgitter-Salder section (northern Germany) with the Slupia Nadbrze~na (central Poland). However, some attendants, including ICS Secretary P. Bown, disagreed with this proposition being against the ICS rules, and (2) a brief presentation on the base Santonian by C. Paul who illustrated advantages/disadvantages of the two candidate GSSP sections, Olazagutia (Spain) and Ten Miles Creek (Texas). No decision was made.

The Kilian Group (Lower Cretaceous Ammonite Working Group).

The Report on the 3^o International Meeting of the “Kilian Group”, held in Vienna the 15th April 2008, was published in 2009 by S. Reboulet & J. Klein (reporters) and 10 Others (Cretaceous Research, v. 30: 496–502). During the 2008 Vienna meeting of the Kilian Group, the chair S. Reboulet underlined that it would be necessary to preserve the stability in the stratigraphic nomenclature, particularly for the first zone of sub/stages (for example zones recommended by the 1^o and 2^o International Symposia on Cretaceous Stage Boundaries or chosen in the 2004 Geological Time Scale), to make easier the comparison of zonal schemes between different works and to improve communications. Changes (more or less important) could be a potential source of trouble and/or confusion (see different proposals on the Aptian/Albian boundary).

Most activities of the Kilian Group are now focused on ammonite zonal scheme at substage levels (i.e. Lower/Upper Valaginian, etc.).

The next meeting of the Kilian Group will be held during the next congress of the "Cephalopods, past and present" in September 2010 at Dijon (France).

The Berriasian GSSP and the J/K boundary.

In 2009 the Berriasian Working Group, convened by the chair W. Wimbledon, had two meetings, the first one at the University of Milan (Italy), 4-6 March, and the second one in Plymouth the 5th September, just prior to the Cretaceous Symposium.

The progresses made by the WG are summarized in the abstract presented at Plymouth by the chair W. Wimbledon, who acknowledged the contributions of 34 scientists (from Canada, China, Czech Republic, France, Italy, Slovakia, Spain, Sweden, Russia, The Netherlands, Tunisia, Ukraina, United Kingdom, and USA).

Wimbledon wrote: “The issue of a Jurassic/Cretaceous boundary was seriously considered time ago only in two colloquia (Lyon and Lyon/Neuchatel) during which formal votes adopted the ammonite assemblages of the *Pseudosubplanites grandis* and *Berriasella jacobi* subzones as indicators for the base of the Berriasian. The overwhelming majority of authors have continued to use the *jacobi* subzone (base of *grandis* zone) or *grandis* subzone in defining a stage base, or a vaguer *grandis* or

jacobi/grandis zone. It has become clearer that these subzones are not really separable, but, that fact notwithstanding, even in the large part of the World outside Tethys, work on fixing a boundary has continued to concentrate on correlating with.

In the first three meetings of the new Berriasian Working Group consideration has focussed on a boundary interval in the lower and middle *jacobi/grandis* zone, and specifically on the best markers already identified in Tethys and some of the better correlative tools for achieving correlation there and with both Boreal marine and non-marine (Purbeck) sequences - wider correlation being the primary aim. There has been a clear acceptance that ammonites alone are unlikely to effect consistent and widely applicable correlation, nor can they contribute in the widespread non-marine sequences.

As a first step, the WG has agreed that the interval offering the best opportunities for study, because it is the one with most, well-defined, markers, is that just below and above the base of chron M18r. The upward sequence from the middle of M19n through M19n.lr, M19.ln and into M18r, in particular, provides several well-established datums in close order, notably based on calpionellids and nannofossil ranges, the calpionellid biozonation and magnetostratigraphy. In particular, four reliable well-marked datums occur in an even shorter interval giving a core framework for comparison. These are the base of calpionellid zone B, the 'explosive' appearance of a monospecific association of small, globular *Calpionella alpina* (the *alpina* "acme", or the *alpina* "bloom" *auctorum*), the FAD for two subspecies of *Nannoconus* (*N. steinmannii minor* and *N. kamptneri minor*) and the base of M18r. In all cases, these are horizons which have been widely and consistently recognized by a number of researchers, and where biozone B is concerned, it has in recent years become a *de facto* working base for the Berriasian Stage amongst a wider group of users. Macrofossil datums will be linked to this framework, and, for instance, foraminiferid, radiolarian, geochemical and cyclostratigraphic signals must also be added.

Thus primary markers and secondary constraining datums can be listed as follows:

Primary markers

1. base calpionellid biozone B
2. 'explosion' of small globular *C. alpina*
3. FAD *Nannoconus steinmannii minor* & *N. kamptneri minor*
4. base M18r

Secondary supporting markers

5. base M19n.ln
6. base M19n.lr
7. FAD *Nannoconus wintereri* & *N. cuvillieri*
8. base *jacobi* subzone
9. FAD *Warrenia californica*, *Dichadogonyaulax bensonii* & *Ampulatisporis verbitskayae*
10. base *lamplughi* biozone
11. base *grandis* subzone
12. LAD *Dichadogonyaulax pannea*, *Egmontodinium polyplacophorum* etc. in the late Portland extinction.

(The labels "primary" and "secondary" are indicative, not absolute. They reflect the WG's current focus of attention on the four closely located datums.)

Having discussed the consistency of proposed datums overall, the WG now studies the precise stratigraphic relationships in this limited interval; that is, testing current assumptions on the sequence of the four datums, on their ranges, relationships to one another and to other datums. In addition, thought is being directed to secondary markers which could be tied directly to the primary datums, or interdigitated between them, allowing correlation to wider geographical areas. Thus the work of the WG in coming months is of precise calibration of stratigraphic markers in the chosen M18r/M19n interval.

The base of M18r has been chosen in preference to short magnetic intervals below because such short intervals are less easy to detect in shallow marine and non-marine settings. The list above is far from exhaustive and more data will be added, to reinforce the framework that is emerging. In relation to sequences that have been well documented, this interval can be identified (using at least some of the chosen markers) and equates to, for instance, sections at Bosso, Brodno, Torre de' Busi, Puerto Escano in Tethys, Durlstone non-marine western Boreal, and Nordvik in the far eastern

Boreal.

Clearly the approach is constrained by the fact that the fuller range of evidence of the kind discussed here comes from sequences in the Tethyan Realm and in Boreal regions, though a number of localities in England and N. France have, for instance, a magnetostratigraphic record, that can only be said of one other site (Nordvik, Siberia). Further, many more coherent sequences of the 'right' age have been identified and documented in Tethys. Much detailed study and refinement of the data lies ahead." A paper on the main results is in preparation.

The next meeting of the Berriasian Working Group is planned at the Smolenice Castle (50 km NE of Bratislava) for 6-9 April 2010, hosted by Dr Jozef Michalik and Slovak colleagues.

Base Valanginian GSSP.

The activities in 2007 concentrated on the section at Montbrun-les-Bains (S. France) that was logged again in more detail by Bulot and Reboulet in order to provide a reliable correlation to the Sr and $\delta^{13}\text{C}$ curves established by McArthur et al. (2007). For the same section detailed data on ammonites, calpionellids, and calcareous nannofossils (still unpublished) are also available and chemostratigraphy is in progress, but no magnetostratigraphy. For the alternate section near Caravaca (Spain) Aguado et al. (2000, Cret. Res., v. 21) provided a detailed synthesis of biostratigraphic and magnetic events and they note that the Spanish sections are the only ones in the world where a direct correlation has been made between magnetic chrons and ammonite zones at this level. In the Spanish section, although richer in ammonites, the calpionellid record is "weak" compared to Montbrun-les-Bains, mainly for preservation problems. The chair of the Valanginian WG, Luc Bulot, and S. Reboulet are working with a multidisciplinary approach for better characterizing the lower part of the Vergol section and so the Berriasian/Valanginian boundary. However, the GSSP proposal will be not submitted probably until 2010.

In addition, Reboulet and Bulot are working hard on substage subdivision and could write a proposal on the Lower/Upper Valanginian GSSP on the Vergol section for the end of 2010-beginning of 2011.

Base Hauterivian GSSP.

Luc Bulot has now received the various contributions from colleagues who have been analysing data from the intended GSSP at La Charce, France. He is collating the data to send to P. Rawson so that he can then put the whole draft report together, then send it to the chair of the group, Joerg Mutterlose, for him to check and send to members of the WG. The whole procedure is expected to be completed and the report sent to Voting Members hopefully within the next months. Based on the works by Bulot and Reboulet, the La Charce section could be a very good candidate also for the Lower/Upper Hauterivian boundary.

Base Barremian GSSP.

The Spanish colleagues (led by Miguel Company) have prepared data on the proposed section in Spain and as far as the chair, P. Rawson, knows it is more or less complete. Based on the work by the Kilian Group, the ammonite zonal scheme for the Barremian is now revised with the *Taveraidiscus hugii* auctorum (index-species must be revised) Zone as the first zone of the Barremian. Thus the Barremian Working Group is now able to prepare a formal proposal as currently recommended. As far as substage subdivision is concerned, most of members of the Kilian Group agree to use the solution of the Brussels meeting: *T. vandenheckii* Zone as first zone of the Upper Barremian.

Base Aptian GSSP.

A wealth of data have been added and published since 2007 by our French colleagues on the stratotype sections of Bedoulian and Gargasian substages including revised biostratigraphies, $\delta^{13}\text{C}$ curve and cyclostratigraphy. A memoir edited by Moullade et al., synthesizing all the gathered data can be found also in Notebooks on Geology (on-line). 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 ogranlensis* Zone. A formal proposal is expected soon by the chair of the WG.

Base Albian GSSP.

The formal proposal, prepared early in 2007 by J. Kennedy and distributed to the members of the WG has received only very few comments. In spite of that, the proposal was sent to the Voting Members, however, the ballot did not reach the quorum (6 YES, 5 NO, 1 abstain). 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.) makes the Tartonne section unsuitable as the basal Albian GSSP. In addition, the sampling across the Aptian/Albian boundary is loose and not at the high resolution as requested for such critical interval, and the applicability of the proposed event (FO of *L. tardefurcata*) to other sections, especially outside SE France, is not documented. To overcome the difficulties for worldwide correlations a specific Working Group was set up in Plymouth (Gale, Kennedy, Huber, Jenkyns, and Paul Bown as the coordinator) with the task to re-sampling and re-studying at really high resolution the Tartonne section or any other suitable one.

Base Coniacian GSSP.

There is a general consensus to use the first appearance of *Cremnoceramus deformis erectus* (Meek), a well recorded cladogenetic speciation event, for identifying the base of the Coniacian. This event is clearly recognizable in the whole Euramerican biogeographic region, and in the Tethyan Realm; and it appears to be easily correlatable outside these areas. This Euramerican biomarker is therefore either valid on its own for recognizing the base of the Coniacian Stage directly, or it enables indirect correlation with most of the coeval marine successions elsewhere in the world. The inoceramid-based lower Coniacian boundary slightly post-dates the traditional ammonite (FAD of *Forresteria petrocoriensis*) position of the boundary. Among the candidate sections, included in the Brussels 1995 report, the Wagon Mound section (US Western Interior) turned out to be entirely Turonian and the Pueblo section (US Western Interior) appears to be incomplete a small distance above the boundary, and the Salzgitter-Salder section (northern Germany), was shown to be condensed or to contain a short gap just at the accepted boundary level. The Slupia Nadbrze~na (central Poland), the most complete succession across the boundary known to date, is unfortunately poorly exposed. To overcome such multiple problems, the WG chair I. Walaszczyk and his collaborators will propose as the boundary stratotype the Salzgitter-Salder - Slupia Nadbrzezna composite section. The final report on the base of Coniacian will be submitted for publication in Acta Geologica Polonica and contemporaneously to the Subcommittee before the end of 2009. Besides multiple biostratigraphies, the report now includes also the isotope curves by Silke Voigt for both sections.

Base Santonian GSSP.

The final proposal for the base Santonian at Olazagutia (Spain), prepared by the chair M. Lamolda, was distributed for approval and/or comments to the Voting Members first at the end of July 2008, and again in Spring 2009 without reaching the quorum of positive votes. The proposal will be distributed again soon to the Voting Members.

Base Campanian GSSP.

The paper on the base of the Campanian at the Waxahachie dam spillway section (northcentral Texas) was published in 2008 by Gale et al. (Cretaceous Research, v. 29: 131-167). The problem concerning who owns the land where the Texas section is situated is still unsolved. Moreover, it is worth mentioning that the correlation of the Waxahachie dam spillway section and Seaford Head (Sussex, England) section, with the pelagic successions based on calcareous plankton is not straightforward. A new section is needed.

Base Maastrichtian GSSP.

To overcome the problem of correlation, stable isotopes were measured in high resolution at Tercis. Data will be published in the next few months and Tercis isotope curve will be compared with those from the Vistula River section (Poland) and the magnetostratigraphically calibrated Gubbio sections (Italy) by Silke Voigt and collaborators.

6. CHIEF PROBLEMS ENCOUNTERED IN 2009

The need nowadays for a high-resolution framework to be exportable worldwide 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.

7. SUMMARY OF EXPENDITURES IN 2009 (ANTICIPATED THROUGH MARCH 2010):

I. INCOME

ICS subvention for 2009 (2500 \$)	Euro	1826.31
ICS extra subvention for support to Russian scientists (1000\$)	Euro	676.37

Total income	Euro	2502.68

II. EXPENDITURE

J/K meeting,, Milan, 6-8 March (organization+lodging)	Euro 1034.00
Participation to Plymouth Symposium (Chair+other participants)	Euro 864.00
1 st Contribution to Russian scientists	Euro 500.00
2 st Contribution to Russian scientists	Euro 200.00
Office (chair & secretary) expenses	Euro 250.00
Bank Expenses (twice)	Euro 24.00

Total expenditure	Euro 2872.00

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2010):

Membership of Cretaceous Subcommittee.

The Voting Membership of the Cretaceous Subcommittee will be implemented during the next few months. In fact, the mandate for 5 Voting Members expired in 2008. Nominations have already been requested.

Meetings

- The 5^o meeting of the Berriasian and J/K boundary WG is planned for 2-4 April, 2010 at Smolenice Castle, Slovakia.
- The 4^o meeting of the Kilian Group will be held during the next congress of the "Cephalopods, past and present" in September 2010 at Dijon (France).
- ICS workshop, Prague, late May 2010
- The 6^o meeting of the Berriasian and J/K boundary WG, pending

Work Plan and anticipated Results

- To bring recommendations for 6 of the remaining GSSPs to ICS as soon as possible
- To advance considerably on definition of criteria for identifying the base of the Berriasian and the J/K boundary.

9. BUDGET AND ICS COMPONENT FOR 2010

Office expenses (Fax, phone, postage, etc)	Euro 250
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Organization expense for the J/K Smolenice Castle, (Slovakia) Meeting	Euro 500
Support to participants to the J/K Smolenice Castle Meeting	Euro 1000
Contributions to help costs of participants to the ICS Workshop, Prague	Euro 2000

Total estimated expenditure	Euro 3750

10. SUMMARY OF CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2005-2009)

See Accomplishments in ICS Annual Reports 2005 to 2009 (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 and 2008 Oslo meetings.
- Presentation of the latest results to 7th *International Cretaceous Symposium*, Neuchâtel, Switzerland. September 4-9, 2005.
- Workshop on the Aptian ammonite zonation, held in Lyon (Nov. 2005) focused the discussion mainly on the ammonite faunal turnovers and the Lower/Middle Aptian (Bedoulian/Gargasian) boundary in relation to the position of the Furcata Zone.
- Set up of the renewed Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon (Dec. 2006-Spring 2007).
- 2nd Workshop of the Kilian Group on the Hauterivian-Barremian zonation, held in Digne-les-Bains (May 2007), from the **Radiatus** (base of the Hauterivian) to the **Sarasini** (top of the Barremian) zones.
- 3rd Workshop of the Kilian Group on the Hauterivian and Barremian zonation, held in Vienna (April 2008)
- 1st official meeting of the renewed Working Group on the Berriasian GSSP and the J/K boundary, chaired by W.A.W. Wimbledon in Bristol (July 2007).
- 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).
- 33rd Geological Congress, August 2008, Oslo: 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).

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

SCS meeting during the 7th *International Cretaceous Symposium*, Neuchâtel, Switzerland, September 2005

- 1° meeting of the *Berriasian and J/K boundary Working Group*, Bristol (UK), July 2007
- 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

11. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2009-2013)

Meetings

- September 2009 - the 4th Workshop of the Berriasian and J/K boundary WG at the 7th International Symposium on Cretaceous System, Plymouth (UK)
- September 2009 - Subcommission Official Meeting at the 7th International Symposium on Cretaceous System, Plymouth (UK)
- April 2010 – the 5th Workshop of the Berriasian and J/K boundary WG is planned in (near Bratislava, Slovakia)
- September 2010 – 4th Workshop of the Kilian Group at the 8th International Symposium “Cephalopods present an past”, Dijon (France), focused on problems of the Aptian and Albian stages
- September 2013 – 9th International Symposium on Cretaceous System, Middle East Technical University, Ankara, Turkey. Convenor: Ismail Omer Yilmaz.

Details of other meetings are not yet available.

Objectives

- To submit the proposal of Santonian GSSP to ICS, and to submit it to Episodes for publication
- To re-submit the proposal of Albian GSSP to the Cretaceous Subcommission voting members, then to submit it to ICS, and possibly to Episodes for publication
- To bring recommendations for 6 of the remaining GSSPs to ICS as soon as possible
- To advance considerably on 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

2009 (end) - Complete voting on the proposal for the base of the Santonian
 2010 – Finalize the proposal for the base of the Albian
 2010 - Finalize proposals for the base of Valanginian, Hauterivian, Barremian, Aptian, Coniacian, and Campanian

2010 - Finalize the proposal for the base of Berriasian (Jurassic/Cretaceous boundary)
2010 to 2013 – Definition of substages.

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

Subcommission officers (with addresses)

Chair: Prof. I. Premoli Silva

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Vice Chair: Dr. I. Walaszczyk

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Secretary: Dr. Silvia Gardin

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List of Voting Members

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Prof. Jim Channel (USA)	jetc@nersp.nerdc.ufl.edu
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Prof. Helmut Weissert (Switzerland)	helmut.weissert@erdw.ethz.ch
Dr. William A.P. Wimbledon (UK)	newaberdon@tiscali.co.uk

List of Task Groups and their officers

Maastrichtian WG: GSSP ratified. Giles Odin, France. gilodin@moka.ccr.jussieu.fr
Campanian WG: jim.kennedy@oum.ox.ac.uk, Andy Gale (UK) asg@nhm.ac.uk
Santonian WG: Marcos Lamolda, Spain. mlamolda@ugr.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
Barremian WG: Peter Rawson, UK. peter.rawson1@btinternet.com
Hauterivian WG: Jörg Mutterlose, Germany. Joerg.Mutterlose@rz.ruhr-uni-bochum.de
Valanginian WG: Luc Bulot, France. lucbulot@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

Vise-chairmen: Peter Rawson, UK. peter.rawson1@btinternet.com,

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