

## **18<sup>TH</sup> SESSION OF DDE EC**

**Venue: China University of Geosciences (Beijing)**

**Format: In-person (+ Zoom Remote Access)**

**5 April 2026**

**0900-1200 & 1400-1700 hrs**

### **SUMMARY**

The DDE Executive Committee was pleased to have its first in-person meeting since the current Members assumed their roles in 2025. The EC Chair provided a brief overview of the Strategic Planning meeting during 3 and 4 April in Beijing which addressed some of the items included in the EC Meeting agenda and in which all EC Members except one attended in person. The EC members urged the early release of the DDE International Science Initiative (ISI) document to the public and discussed the evaluation procedure of project proposals to be invited under DDE-ISI. The EC emphasized the role of the DDE Science Committee (SC) in all stages of the evaluation of proposals received for DDE funding under the DDE-ISI. The EC Members tentatively agreed to convene the DDE Forum during October 22-24 in Beijing, immediately after the ISC conference open sessions in Beijing, from 19 to 21 October. The EC supported focusing the EGU Town Hall meeting on 5<sup>th</sup> May in Vienna, Austria, on publicizing the DDE-ISI and informing the attendees of the plans for the call for project proposals under DDE-ISI soon. EC addressed several international partnership initiatives, including that with CCOP, a DDE GC member representing 16 East and Southeast Asian nations. The EC requested the Secretariat to act on some of the items on its agenda, for example, WTG Review and Support, which were discussed in more detail during the Strategic Planning meeting during 3-4 April and implement actions foreseen. The EC urged the EC Chair to respond to the letter from the Secretary General of IUGS of 20 February 2026, in particular addressing IUGS Members' concerns on IUGS-DDE relations to European data security concerns. EC expressed its wish to learn the outcome of the DDE-CCOP Business Meeting on 8 April in Brunei and took note of the ways and means that the Secretariat wishes to try to raise funds from sources outside of China. EC welcomed the suggestion that the DDE Secretariat prepare proposals for strengthening the Secretariat based on actual needs of the Secretariat for effectively implementing the DDE Strategic Framework 2025-2028.

### **FOLLOW-UP ACTIONS**

- Chao: Contact Zhejiang University to clarify who is responsible for the 3D outcrop component of the DDE platform, determine if there are contracts or legal arrangements regarding content and modifications, and report findings to EC.
- Secretariat: Circulate the IP and data sharing policy documents to all EC members for review and comment.
- Secretariat: Communicate with all GC member organizations to verify and update on www.ddeworld.org, contact information and identity, credentials and contact emails of their representatives to the GC.
- Hans (Chair of Science Committee): Develop a proposal for the retention of existing and evaluation of proposals for nominations of new members to the SC in accordance with the provisions of the DDE Statutes, giving due consideration to geographical, gender and disciplinary balance.
- Secretariat: Send message to all GC and EC members announcing the upcoming revision of Science Committee Membership, inviting nominations and requesting short descriptions of expertise and CVs of nominated individuals.
- Mike: Prepare and send a tentative budget for participation in the Earth Sciences Olympiad in Turin to the Secretariat.
- Secretariat (in coordination with Suzhou Center): Estimate funds available from 2025 budget and aim to finance all unplanned events for 2026 considered by the EC under agenda item 5, such the IESO meeting in Turin, Italy, in August 2026, the IAGOD quadrennial meeting in Portugal in August-September 2026 and DDE participation in the IDSSD Conference organized by UNESCO in mid-July 2026. Use 2026 funds for the Suzhou Center to meet any shortfalls. Prepare detail budget proposals for confirmed events in 2027, for example CAG 31 in Ghana in September 2027 before the June 2026 deadline when the Suzhou Centre will submit budget proposals for 2027.
- Secretariat (in coordination with relevant centers): Identify needs for Secretariat strengthening, consult with EC/SC/GC as needed, and prepare a proposal (including positions, levels, and budget) for EC review.
- Secretariat: Add/update visible links and descriptions for the DDE platform (www.deep-time.org) on www.ddeworld.org homepage to improve user navigation and access.
- Secretariat: Circulate the official, finalized proposal for the DDE Frontier Science Center (with CUGB university stamp/signature) to EC for final approval and include that official proposal as an annex to these minutes.

- [Secretariat: Follow-up on plans to redesign and update www.ddeworld.org, by calling for 2 or more proposals through an open bidding process for circulation to EC Members and report on the outcome of proposal evaluation and recommendations to the EC at its next session. Secretariat: For future project contributions to the DDE Platform, establish clear rules/procedures regarding responsibilities, benefits, and legal/ownership issues, and circulate for comment.](#)
- [Secretariat \(in coordination with relevant parties\): Investigate, in discussion with MOST, Suzhou Center and other stakeholders the inclusion of a contingency/unforeseen expenses line in all future, annual budget proposals which could be used to support unplanned events and activities that DDE EC considers important for implementation of the DDE Strategic Framework.](#)
- [Secretariat: Revise DDE Statutes and provide the first draft for review by EC Members, GC President, SC Chair and others as appropriate.](#)

## MEETING MINUTES

### Updates on implementation of 17<sup>th</sup> EC follow-up actions

Following the opening remarks of the EC Chair and adoption of the agenda (see annex 1), the Secretariat provided an update on follow-up actions that were implemented fully, would be considered under different agenda items of the current 18<sup>th</sup> session and those that will be acted upon after the 18<sup>th</sup> session. The EC was informed that Prof. Yamirka Rojas-Agramonte, nominated as the 7<sup>th</sup>, DDE EC Member will be able to take up her functions only after August 2026, if her nomination is confirmed. The EC recalled that the nomination and inclusion of a 7<sup>th</sup> EC Member, as decided at its 17<sup>th</sup> session, require the revision of the DDE Statutes and its adoption by the GC. The EC further suggested that important outcomes of the Strategic Planning meeting held during 3-4 April be integrated into the Secretariat follow-up to the 18<sup>th</sup> session as appropriate. The EC urged its Chair to respond to the letter of IUGS Secretary General of 20 February 2026 soon after the conclusion of the 18<sup>th</sup> session.

In discussions related to responding to IUGS's request that DDE address 'European Security Concerns', many of the opinions of EC Members and Secretariat staff expressed at the 17<sup>th</sup> session of the EC convened online on 25 February were recalled. A Member of the EC (Anna) and another from the Secretariat (Mike) continued to call for direct dialogue with those few persons who express doubts on the usefulness of IUGS and DDE relations based on such security and other concerns. The EC suggested that Mike explores ways of assuaging such doubts and concerns by explaining some of the steps that have been and are being taken by DDE.

## **DDE ISI and Funding International Projects under the DDE Strategic Framework 2025-2028**

The EC encouraged the Suzhou Center and the Secretariat to finalize and publish the DDE-ISI (DDE International Science Initiative) as quickly as possible after the end of its 18<sup>th</sup> session, and preferably before the DDE Town Hall meeting scheduled for May 5 at EGU 2026, in Vienna, Austria. The templates for the Geological Mapping and Geological Timeline programs should also be finalized and calls for proposals invited and opened; other programs, in particular those concerned with Plate Tectonics and Sustainable Earth Resources could immediately follow using the templates for the earlier two programs referred to above that are nearing acceptance by the Finance Department of MOST which is answerable to Ministry of Finance of the Chinese Government responsible for the use of all public funds. The Earth System modelling program, which is likely to have links to the “OneEarth” digital and AI aided hub to be established under program 1 to be developed by the Zhejiang Alliance may require more consultations and collaboration.

EC Members stressed that the DDE SC must be closely engaged in all steps of the process of evaluating project proposals received under DDE-ISI: from establishing list of experts who would do the first review of the proposals after the Secretariat has completed administrative screening of proposals to choosing the final list of ranked proposals for approval by the EC. One EC Member (William) stressed the need to make the engagement of SC in all the steps of the DDE-ISI project evaluation processes clear to avoid any misinterpretation of the credibility and rigor of the scientific evaluation of proposals. The Secretariat lead for the EGU Town Hall meeting on 6 May (Mike) urged that DDE-ISI and additional information on plans for calling of proposals under DDE-ISI be shared with attendees of the Town Hall meeting which may include potential funding partners like UKRI, NERC from the UK and NSF, USA. EC agreed that DDE should use this opportunity to announce the ISI initiative and potentially invite representatives from these and other potential organizations to discuss collaboration possibilities.

The DDE Strategic Framework 2025-2028 foresees IGC 38, in Calgary, Canada, in August 2028 as an important milestone to highlight DDE achievements of the implementation of the DDE Strategic Framework 2025-2028. The delays experienced in the finalization of the DDE-ISI and project proposal templates, initially targeted for end of 2025, should not distract the DDE GC, EC and SC and the Secretariat from ensuring deliverables to IGC 38 in Calgary, Canada. All agreements signed with the project PIs must require them to define deliverables at the Calgary event in August 2028 that are linked to initial or subsequent funding.

The EC, after considering various options, decided to tentatively schedule the DDE Forum for October 22-24 in Beijing, immediately following the ISC Conference Open Sessions in Beijing from 19 to 21 October. The EC Chair stressed the need for identifying China-based partners for

Forum organization who can provide logistical and, probably, financial support. The Secretariat confirmed that this event has been budgeted based on discussions with the Suzhou Center in the latter half of 2025; the budget proposals may have to be revisited once potential partners are identified, both Chinese (CGS, Zhejiang Center, CUGB etc.) and international (e.g., UNESCO, CODATA, Geological Society of Africa and interested DDE GC Members). The EC requested its Chair to undertake necessary consultations, firstly with Chinese partners to finalize the venue and the dates and then begin discussions with international partners to learn of the kinds of contributions they could offer.

### **Planning and Budgeting for DDE representation in international, regional and national events, including in-person DDE GC and EC meetings as appropriate**

Recalling discussions on Agenda item 5 during the Strategic Planning meeting discussions during 3-4 April, EC Members reiterated that DDE presence in some of the unplanned, hence unbudgeted events listed in Agenda item 5 (see annex 1) is critical for ensuring DDE's visibility and credibility. The IDSSD Conference in UNESCO, Paris, in mid-July, the IESO event in Turin, Italy in August and the IAGOD quadrennial conference in August-September are of particular importance. EC requested the Suzhou Center and the Secretariat to take all necessary steps to ensure that DDE sponsorship and participation in those events are financed from 2025 and/or 2026 budgets as appropriate. One EC Member (William) urged the Suzhou Center and the Secretariat to find ways to include a contingency and unforeseen budget line, currently not allowed by Government Finance Ministries at the Central and Provincial levels, in future annual budget planning processes.

There was also discussion on the need to review the selection of events for DDE participation. Questions such as whether we need to repeat past activities, for example hosting a DDE booth at all future events, were raised. It is important to assess the impacts of DDE participation in events so far and introduce steps into future events planning that would clearly describe expected outcomes and impact of DDE sponsorship and/or participation in international, regional and national events. The EC suggested the establishment of a small group to address this matter and recommend measures to the EC.

The Secretariat (Mike) -using statistics from recent reports of the IMF and others- emphasized the need to continue and strengthen DDE engagement with Africa and contributions to African geology and geologists. The Treasurer (Yukun) pointed out that the budget planning for 2027 is currently underway, and proposals have to be submitted in June 2026. An EC Member (Anna) urged the Secretariat to prepare a budget for CAG 31, scheduled to be convened in Ghana in September 2027. The EC requested that the Secretariat ensure that the budget for CAG 31 and

other important events for DDE participation in 2027 are included in the budget proposal to be submitted to MOST in June 2026.

Regarding DDE's Africa initiatives, EC Members' attention was drawn to the DDE-CADF joint initiative for Africa co-signed during the DDE technical session in Indaba, Cape Town, on 10 February 2026. Possibilities for using that initiative to support DDE interests in Africa, for example travel support to African participants to DDE Forum, CAG 31 (CADF has its West African Office in Accra, Ghana) and to African graduate students and early-career scientists interested in pursuing graduate studies and collaborative research with Suzhou and Zhejiang RCEs, as well as DDE MR in CUGB and other DDE linked institutes in China must be explored.

### **DDE Digital Infrastructure and Websites Planning**

A member of the DDE Secretariat (Chao Li) presented information on the two DDE websites: [ddeworld.org](http://ddeworld.org) for public communication and [www.deep-time.org](http://www.deep-time.org) as the digital platform for hosting and sharing databases and for users to benefit from data, computation power, models and other resources for their research, education and communication endeavors.

A comprehensive redesign and updating of [ddeworld.org](http://ddeworld.org) is foreseen and is due to be completed within the next 6 months, at a preliminarily estimated cost of \$30,000. Currently the cost of operating and maintaining [ddeworld.org](http://ddeworld.org) is \$10,000/year. The company that will be assigned the task of redesigning and redeveloping [ddeworld.org](http://ddeworld.org) must be chosen through a competitive bidding process.

The DDE Platform, i.e., [www.deep-time.org](http://www.deep-time.org), was supported by the distributed DDE Cloud infrastructure in Hong Kong and Frankfurt when it was launched at the DDE Open Science Forum in November 2022 in UNESCO, Paris. Currently it is financed entirely by Zhejiang University, and its annual operational budget is not known. The Platform claims about 5,000 users. DDE has no formal agreement with Zhejiang University for Platform operations and management. Recalling presentations made by DDE Platform representatives during the Strategic Planning meeting during 3 & 4 April, the EC was informed that the Platform hosts databases that are voluntarily provided by the owners of the databases and who define the conditions of use of their databases on the Platform. The EC Chair however, noted the process for establishing agreements with data providers to the Platform was not transparent and gave examples of work conducted by his and other research groups in China whose contributions are not acknowledged. Discussions considered the closing down of the Platform temporarily to sort data ownership and sharing rules and regulations. Secretariat (Mike) emphasized the importance of the Platform for many users in Africa, adding that he himself is a regular user and had published several papers using the resources of the Platform. He cautioned against any closure of

the Platform without informing the users and how quickly it will be re-opened to avoid the users migrating to other Platforms providing similar services.

One case of the lack of clarity on ownership of data on the DDE Platform is that of the 3D outcrops. All the data currently on the Platform was contributed by Prof. Zhong Hanting of the Chengdu University of Technology (CDUT). However, communications between that CDUT research group and Secretariat is no longer functional. The interest of a DDE financed project approved in 2024, implemented by the AGI (American Geosciences Institute) and the Asia Pacific University in Malaysia, to improve the database to make it useful for geosciences education in high schools is experiencing difficulties and the CDUT team has not responded to Secretariat queries. The EC requested the Secretariat (Chao Li) to discuss with the Platform this matter related to 3D outcrops, and broader data ownership, funding and operational and maintenance budgets discussed during the EC session and report back to the next session of EC.

The DDE relationship with GeoGPT, owned by the Zhejiang Lab, is better defined in the MoU signed between the two organizations in March 2025. The GeoGPT, made public at EGU 2025 in April-May 2025, has now more than 50,000 users. The Zhejiang International Research Center, a DDE RCE, has recently been integrated with the Zhejiang Lab and this may improve collaboration possibilities between DDE and the Zhejiang Center, which is expected to be the lead for the information science program of the DDE Strategic Framework 2025-2028. Zhejiang Center's intention to launch a "OneEarth" hub as part of its contributions to implementing DDE-ESI needs further discussions to avoid duplication of services already provided by the DDE Platform. The EC also stressed the need to have more information on how the operations of the DDE Platform are being funded and maintained.

The importance of early finalization (currently expected by end of June 2026) of DDE's legal status as an independent "international big science program" is critical and could enable resolving several data ownership and data sharing issues and some of the budget planning problems by allowing DDE to maintain and manage its own bank account.

### **DDE Partners**

EC Members recalled presentations and discussions on DDE relationship with UNESCO, CODATA, Zhejiang Lab and CCOP during the Strategic Planning meeting on 3 & 4 April and urged the Secretariat to take necessary measures to strengthen them. EC noted that the EC Chair (Qiuming), the Secretary General (Ishwaran) and a member of the Secretariat (Juxin Shen) will attend the 81<sup>st</sup> session of the CCOP Steering Committee in Brunei during 6-8 April. In the afternoon of 8 April, a business meeting between DDE and CCOP Steering Committee has been scheduled to explore collaboration focusing on mutually beneficial priorities deriving from DDE Strategic Framework 2025-2028 and the CCOP Strategic Plan for 2026-2030. It is also expected

that the CCOP Steering Committee will consider, and hopefully approve, DDE as a CCOP Cooperating Organization.

The application of the DDE Frontier Science Center of CUGB, China, had been favorably reviewed by all EC Members and the SC Chair after the last (17<sup>th</sup>) session of EC convened on 25 February 2026. However, one EC Member (William) pointed out that the revised application submitted lacked official status because it did not have the signature of the CUGB President and the covering letter lacked any institutional logo and identity. Hence, the EC requested that CUGB DDE Frontier Science Center submit an official application satisfying the above-mentioned conditions which could then be approved by EC Members via email and is included as an annex 2 to these minutes of the 18<sup>th</sup> session of EC.

### **GC, EC and SC Membership, WTGs, Strengthening DDE Secretariat and Fund raising from sources outside of China.**

EC Chair informed EC Members that attendance at GC sessions normally meets the quorum but the Members attending regularly are mostly the same ones; several Members have not attended any GC sessions from 2025 till now. The SC Chair (Hans Thybo) raised questions about the validity of contact emails and affiliations of several Members. The EC requested the Secretariat to write to the Heads of all GC Member Organizations and request them up-to-date information on the names, titles, contact emails and other information of their respective GC Members.

Membership of the DDE Science Committee also requires updating; some Members have withdrawn and 2 new Members nominated but their applications not formally received, reviewed and submitted for approval by EC and GC. The EC requested the SC Chair to write to all SC Members and take necessary steps to renew and update SC Membership in accordance with the provisions of the DDE Statutes. The Secretariat should assist the SC Chair's efforts to renew SC Membership.

The agenda item 12, on WTG status and support was not addressed by the EC because it was presented and discussed during the Strategic Planning meeting on 3&4 April where all EC Members were present; hence, the Secretariat may implement the steps it proposed in its presentation at that meeting and report to the next session of the EC.

The EC noted some of the suggestions proposed by the Secretariat for raising funds from sources outside of China. The EC agreed that funds generated outside of China need not be (i) transferred to China or be pooled with China based funds; (ii) the donor country/organization providing funds could establish a management board to foresee the use of the funds for DDE prioritized scientific program areas; (iii) project proposal evaluation should include EC recommended domain/discipline experts, and (iv) the title of the Fund should include reference to DDE; for example, XXXX-DDE Partnership Fund or similar titles.

EC encouraged that the Secretariat explore raising funds outside of China under its emerging partnership with CCOP, the only intergovernmental organization that is a GC Member representing 16 East and Southeast Asian Nations, building on the DDE-CADF initiative and exploring with UNESCO and UNDP for establishing multilateral trust funds.

The EC postponed discussions on audits of annual DDE budgets and the need for establishing a DDE Finance Committee to its next session.

The EC endorsed the need for strengthening the DDE Secretariat as implementing the DDE-ISI programs and projects will significantly increase the Secretariat's workload. The EC invited the Secretariat to have an internal discussion on its needs and areas of work for which it would require additional staff and the budget needed to recruit and finance them and submit proposals to the next session of the EC

### **Closure of the session**

There were no additional discussions under agenda items 16 (Q&A) and 17 (AOB). The EC Chair thanked all EC Members and the SC Chair, for taking time to come to China for their first in-person meeting and attend the Strategic Planning on 3 & 4 April. He then declared the 18<sup>th</sup> session of the EC closed.

Annex 1

**18<sup>TH</sup> SESSION OF DDE EC**

**Venue: China University of Geosciences (Beijing)**

**Format: In-person + Zoom Remote Access**

**5 April 2026**

**0900-1200 & 1400-1700 hrs**

**Attendees in person**

Qiuming Cheng, Chair, DDE EC

William Cavazza, EC Member

Anna Nguno, EC Member

Yukun Shi, EC Member (to be confirmed by DDE GC by 30 March 2026)

Natarajan Ishwaran (Ish), EC Member

Hans Thybo, DDE SC Chair

DDE Secretariat (Juxin Shen, (Chris), Chao Li and Li Lingyu in person and Mike Stephenson on-line)

**Agenda**

1. Opening and welcome by the EC Chair
2. Adoption of agenda
3. Adoption of minutes of 17<sup>th</sup> EC meeting and briefing on follow-up actions
4. Report on the main outcomes of the Beijing Meetings on 3 and 4 April and follow-up actions
  - DDE-ISI and project calls and implementation – next steps for effective operations 2026-2028

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- Output, expectations and deliverables for Calgary 2028
  - DDE Forum – finalization of Plans about venue, dates, program and other details
  - Any other activities, issues for effective implementation of DDE – ISI during 2026-2028
5. DDE participation in international, regional and national events in 2026
    - CCOP Steering Committee – 6-8 April
    - EGU 2026 – 3-5 May 2026
    - DDE attending UNESCO IDSSD meeting, 15 – 17 July, Paris
    - IGEO/IESO in Turin, Italy, August 2026
    - IAGOD Quadrennial Symposium, Porto, Portugal, August-September 2026
    - ISC Conference in Beijing in October 2026
    - CCOP Annual Executive Committee Meeting in Tsukuba, Japan, November 2026
    - GSA & AGU – October – December 2026
    - 4<sup>th</sup> National Conference on Data-Driven Earth Science
    - 3IAGS Data-Driven Geochemistry: resources and environment (Sept in Beijing)
    - Any others
  6. Infrastructures and websites, DDE Platform and ddeworld.org website
  7. DDE IP and Data Sharing Policy – discussion of draft document towards finalization
  8. DDE Legal Status – registration as an International Big Science Program in China
  9. DDE relations with partners (Ishwaran)
    - Zhejiang Lab
    - CCOP
    - CUGB RCE
    - CODATA
    - UNESCO
  10. DDE GC Members and Membership – activating current Members and attracting New Members
  11. DDE SC members and nomination of SC members
  12. WTG review and support
  13. DDE Budget & Financial Oversight
    - Strategies for mobilizing financial resources outside of China
    - Audit of 2025 budget and financial transactions – do we need to establish a DDE Finance Committee, principles/guidelines for utilization of MOST funds
  14. DDE IUGS Relations and Revised DDE Statutes
  15. Strengthening DDE Secretariat in Kunshan City, Suzhou, China
  16. Discussion and Q&A
  17. AOB
  18. Closing of the meeting by EC Chair.
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**Application for Deep-time Digital Earth Frontier Science Center at CUGB as a DDE Research Center of Excellence (RCE)**

Dear DDE EC

On behalf of China University of Geosciences (Beijing) (CUGB), we formally submit this application for the official designation of the **Deep-time Digital Earth Frontier Science Center at CUGB as a DDE Research Center of Excellence (RCE)**. We propose that this center joins the esteemed ranks of the existing RCEs in Suzhou and Hangzhou, forming a powerful, tripartite core for the DDE Big Science Program within China.

The establishment of the DDE Frontier Science Center at CUGB in 2023, under the direct sponsorship and financial backing of the Chinese Ministry of Education, was a strategic national investment in the DDE program's future. This was not a unilateral university initiative, but a clear endorsement of DDE's vision, designed to provide the program with a permanent, world-class hub for fundamental research and resource development.

**I. DDE Frontier Science Center at CUGB Fulfills and Enhances the DDE RCE Mandate**

**(1) A Mandated Mission of Foundational Support:** Unlike a typical research unit, this Center was created with the explicit, state-sponsored objective to provide "foundational resources and drive applied research for the DDE Big Science Program." Its institutional mission is intrinsically aligned with supporting DDE's core scientific pillars.

**(2) Outstanding Concentration of Scientific Leadership:** The Center is a hub of academic excellence, hosting the prestigious UNESCO Chair on Deep-time Digital Earth and Mineral Resources. This international endorsement underscores our commitment to global knowledge exchange and capacity building. Furthermore, the Center's faculty includes **five distinguished Academicians of Chinese Academy of Sciences**, providing world-class leadership in the critical, interconnected fields of isotope geochemistry, igneous petrology, sedimentation, mineral deposits, and mathematical geosciences and geoinformatics. This concentration of expertise is uniquely positioned to tackle the interdisciplinary challenges at the heart of DDE's mission and provide a platform for international cooperation.

**(3) Integrated Global Governance:** The Center's Scientific Advisory Committee is composed of leading international experts, including several members of the DDE General Expert Group (GEG) and the chair of the DDE SC. This ensures its research agenda is not only locally relevant but is directly guided by and synchronized with DDE's global strategic priorities.

**(4) Strategic Complementation in a Synergistic Workflow:** The unique strengths of the three proposed Chinese RCEs create a complete and seamless operational pipeline for DDE. We envision a synergistic workflow where:

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## 2. DDE Frontier Science Center at CUGB Complements Other DDE RCES in China

The Suzhou RCE focuses on hosting the Secretariat office and supporting the international operations and project management of DDE. For the long run, it also aims to develop an international research center.

The Hangzhou RCE focuses on digital infrastructure development and operation promoting transdisciplinary integrated research of AI + Earth Science.

The proposed CUGB RCE will focus on generating frontier scientific questions, curating and interpreting data through deep domain expertise, validating models with ground-truth science, and training the next generation of DDE scientists. Our leadership in geoinformatics directly bridges the gap between data science and geological theory.

This clear division of labor ensures that administrative, digital infrastructure, and fundamental scientific excellence are each supported by a dedicated center, creating a robust "Governance-Infrastructure-Discovery" triad that will dramatically accelerate DDE's progress.

By formally designating the DDE Frontier Science Center at CUGB as an RCE, DDE will cement a strategic partnership with a nationally funded powerhouse of fundamental geoscience research. This move will solidify the RCE network, creating a robust triangle of excellence that covers international operations, computing, and core science, thereby accelerating DDE's progress towards its grand-challenge goals.

## 3. Mutual Benefits: CUGB Frontier Science Center as A DDE RCE

For the CUGB Frontier Science Center, becoming a DDE Research Center of Excellence raises its international profile, granting it formal recognition as a global leader in data-driven geoscience. This status is further elevated by its existing role as the host of the prestigious UNESCO Chair on Deep-time Digital Earth and Mineral Resources, which underscores its established commitment to global knowledge exchange. The Center gains direct access to DDE's integrated data platforms and advanced digital tools, amplifying the work of its world-class faculty—including five Academicians of the Chinese Academy of Sciences and 88 full-time faculties and many graduate students. This concentration of leading expertise in isotope geochemistry, igneous petrology, sedimentary geology, mineral deposits, and mathematical geosciences provides an outstanding scientific foundation. Students and early-career researchers benefit from training at this intersection of deep disciplinary knowledge and cutting-edge digital methods within an international network, while the partnership underscores China's endorsed support for DDE as a priority international science program.

In return, DDE gains a powerful scientific partner in CUGB. The Center's faculty of Academicians and its UNESCO Chair provide authoritative leadership and deep expertise to help deliver on DDE's core interdisciplinary



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research goals, such as Earth modeling with billion-year tectonic reconstructions and HI and AI integrated procedure for mineral resources assessment and prediction. The Center serves as a premier testing and development hub for DDE's digital tools and platforms, ensuring they are refined by top-tier researchers tackling complex, real-world geoscience problems. Through CUGB's extensive academic networks and its UNESCO-affiliated platform, DDE can significantly expand its reach, engagement, and capacity-building efforts globally. Furthermore, CUGB acts as a flagship education and training anchor, building the next generation of geoscientists, while its preeminent reputation lends long-term credibility, stability, and scholarly weight to the entire DDE initiative.

In summary, CUGB gains amplified global visibility, powerful resources, and a platform to leverage its existing UNESCO Chair and academic excellence, while DDE gains a preeminent, high-performing partner with the interdisciplinary depth and international standing to profoundly advance its scientific mission and global involvement.

Zhidan Zhao President

(Signature)

April 13, 2026

China University of Geosciences (Beijing)

(Seal)



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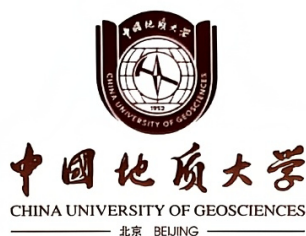
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## Appendix

### **Introduction to the Frontier Science Center for Deep-time Digital Earth, Ministry of Education**

Approved by the China Ministry of Education in 2022, the Frontier Science Center for Deep-time Digital Earth at China University of Geosciences (Beijing) (CUGB) constitutes a vital component of the scientific innovation framework within the "Deep-time Digital Earth (DDE)" Big Science Program. Anchored in Earth's multi-billion-year evolutionary history, the Center focuses on the core scientific theme of "the formation and evolution of a habitable Earth." It is dedicated to deciphering co-evolutionary mechanisms among life, environment, and materials throughout deep time, alongside investigating triggers of extreme geological events, thereby addressing major international strategic needs while advancing fundamental and applied research.

The Center's scientific agenda integrates three interconnected themes: Earth's deep-time evolution, complex Earth systems, and self-organizing interactions among Earth's spheres. By leveraging cutting-edge technologies, including geoscientific analysis, modeling and observation, geoscience big data, supercomputing, and artificial intelligence—it systematically investigates evolutionary processes of habitable Earth and distribution patterns of major geological events. Through developing high-precision prediction and evaluation systems, the Center continuously enhances understanding and forecasting capabilities for critical geological and environmental phenomena, including resource and energy distribution, extreme climate variability, and mass extinction events. Its mission is to establish a world-leading research hub in deep-time Earth science, providing scientific support for international socioeconomic development and ecological civilization initiatives.

The Center currently maintains 88 full-time researchers, including 5 academicians, 20 national-level distinguished scholars, and 16 national-level young talents. Guided by the development philosophy of "breaking bottlenecks, accelerating progress, and achieving leadership," it fosters deep interdisciplinary integration across Earth sciences, computer science, and mathematics. The Center also hosts the UNESCO Chair Program on DDE & Mineral Resources. The center operates under a dual governance structure comprising a Governing Council chaired by CUGB's President and a 12-member Scientific Committee comprising renowned domestic and international experts.

Since its establishment, the Center's research teams have published over 200 high-impact papers, including more than 10 in top-tier journals such as Science, Nature, and PNAS and their subsidiary journals. These publications represent groundbreaking theoretical contributions to frontier areas including deep-time life-environment-material co-evolution and extreme geological events. The Center additionally initiated the "Data-Driven Geoscience Development Committee" under the Chinese Geological Society in 2023. Since then it has successfully organized three annual national symposia that engaged thousands of participants—particularly young researchers, generating substantial academic impact both domestically and internationally.

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