GLOBAL OBSERVATION SYSTEM FOR MERCURY

iGOS4M - Global Observation System for Mercury Isotopes:

https://sites.google.com/view/igos4m/home

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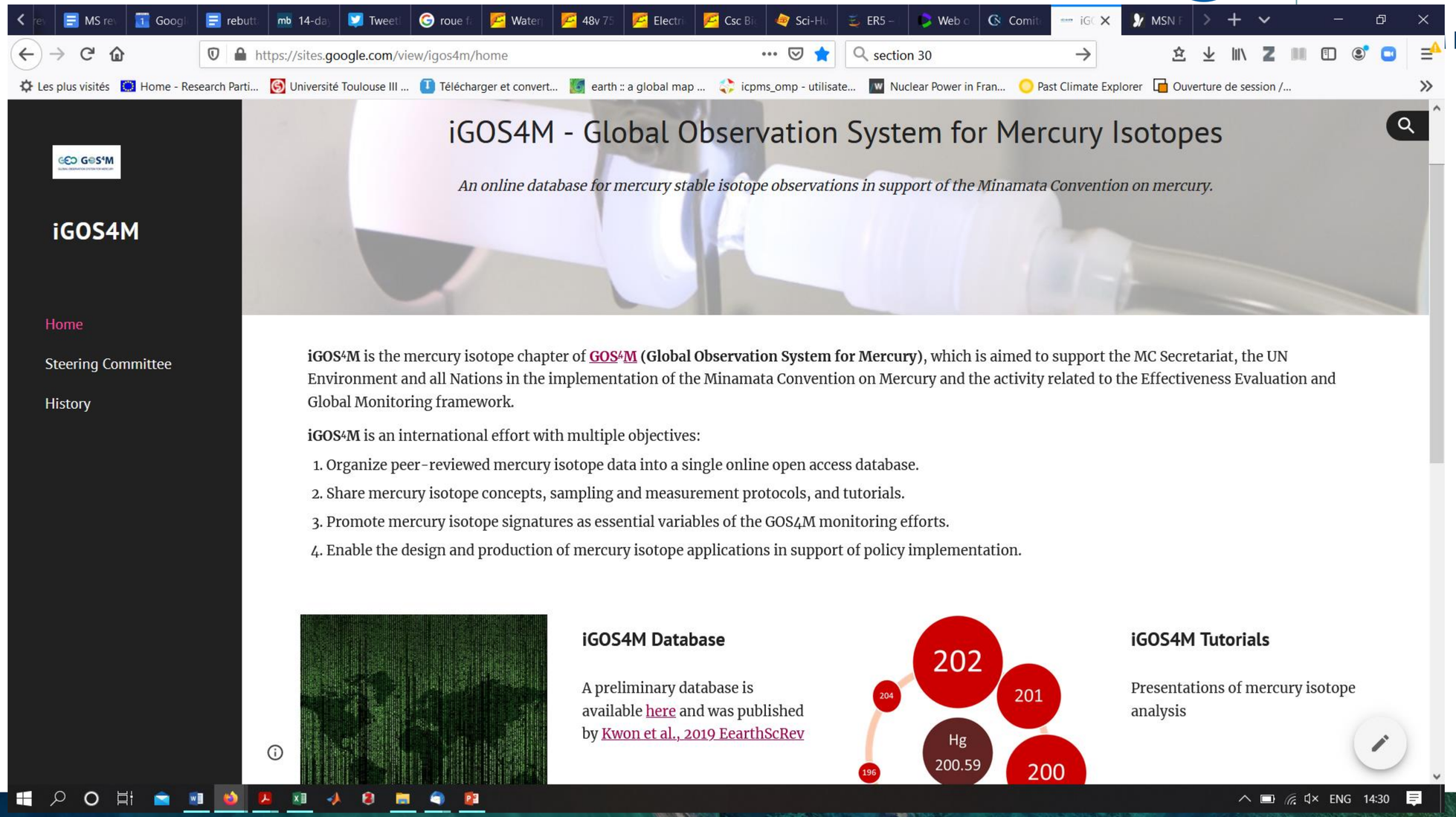

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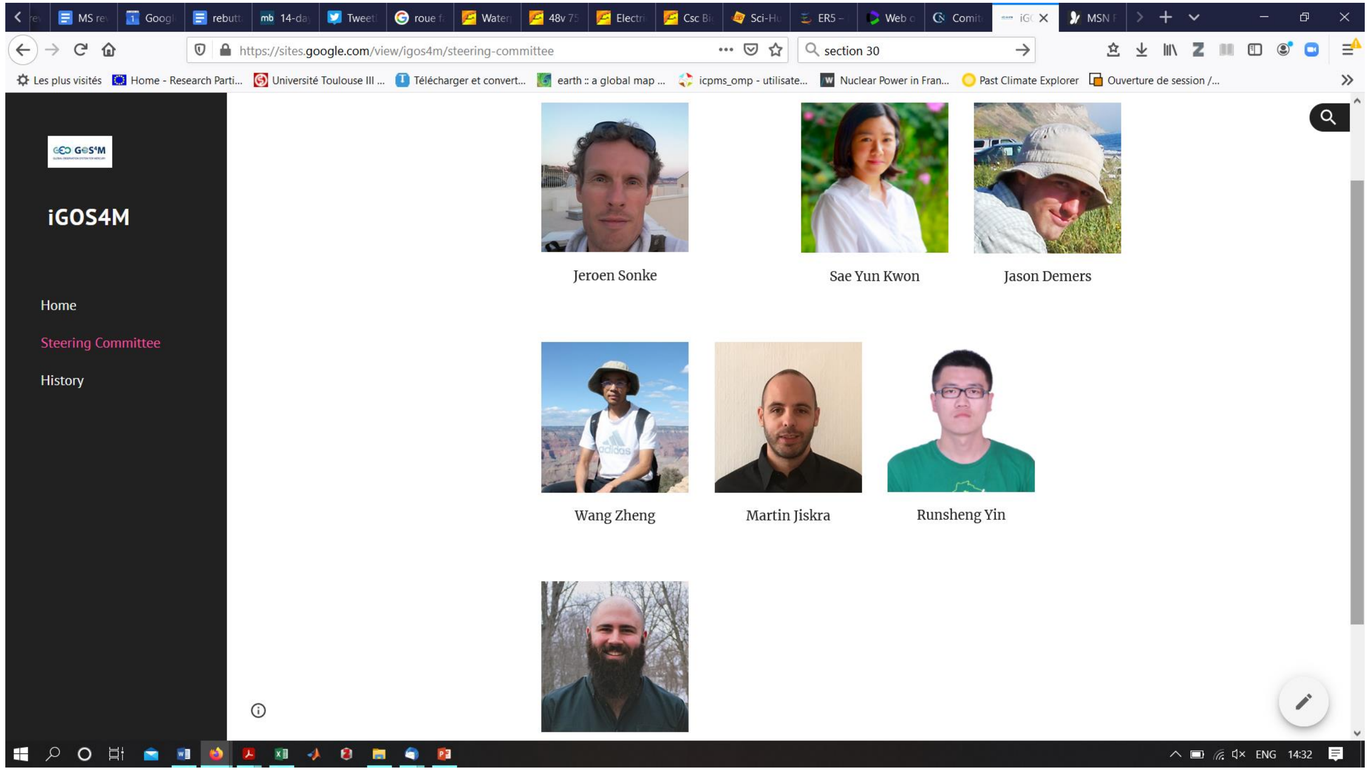
iGOS^{4}M international steering committee (bi-monthly VideoConf):

Jeroen Sonke, CNRS, France
Sae Yun Kwon, POSTECH UST, Korea
Jason Demers, Univ. Michigan, USA
Ryan Lepak, NSF, USA
Wang Zheng, Univ. Tianjin, China
Runsheng Yin, CAS, China
Martin Jiskra, Univ. Basel, Switzerland



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iGOS^{4}M Open Access database

- By the community, for the community
- >200 papers; ~3,874 peer-reviewed Hg isotope measurements (2001-2018) → 7,000 by 2021 and 20,000 by 2030.
- Developed in Gsheets → 2021 transfer to professional CNRS website?
- QA/QC currently based on peer-review
  - Database includes QA/QC results on reference materials
  - iGOS4M will produce review papers on consensus CRM δΔ values
  - iGOS4M QA/QC proposes a library of sampling, preparation and analysis protocols.
- Data policy: free access, cite original studies

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iGOS^{4}M Objectives:

- Organize peer-reviewed Hg mercury isotope data into an online open access database.
- Share mercury isotope concepts, sampling and measurement protocols, and tutorials.
- Promote mercury isotope signatures as essential variables of the GOS4M monitoring efforts.
- Enable the design and production of mercury isotope applications in support of policy implementation.

Hg isotope review and position paper

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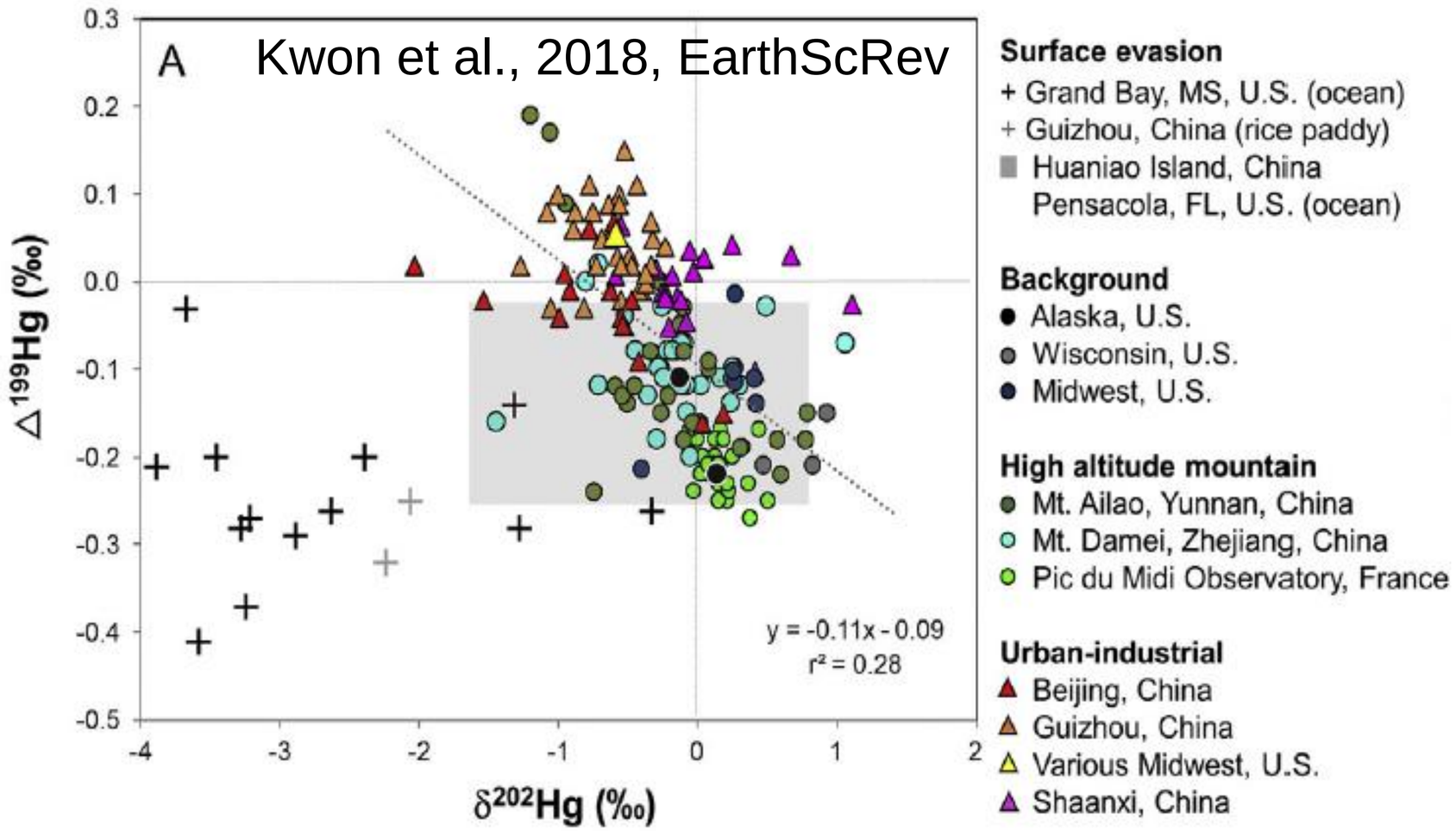
Invited review

Mercury stable isotopes for monitoring the effectiveness of the Minamata Convention on Mercury

Sae Yun Kwon[a,*], Joel D. Blum[b], Runsheng Yin[c], Martin Tsz-Ki Tsui[d], Yo Han Yang[a], Jong Woo Choi[e]

TGM isotope emission source tracing



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TGM Hg isotopes discern anthropogenic from background emissions.
1-year TGM isotope time-series soon available for 10 sites globally

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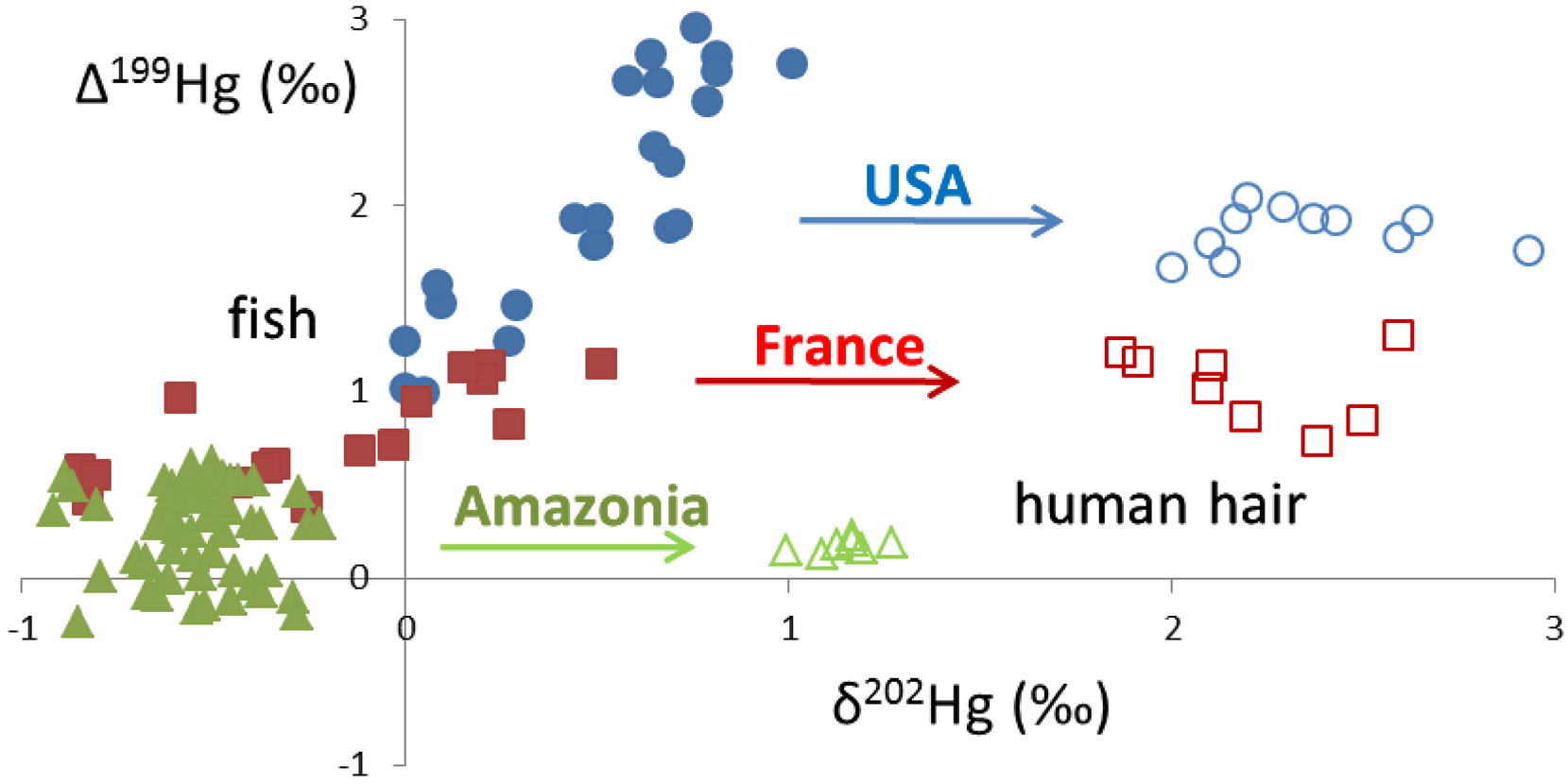

Human hair Hg isotopes identify MeHg exposure sources

Fish: Laffont et al., ES&T, 2009, 2011; Senn et al., ES&T, 2009; Blum et al., Ngeo 2013
Human hair: Laffont et al., ES&T, 2009, 2011; Sherman et al., ES&T, 2013

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Recommended Global Mercury isotope Monitoring for MC Effectiveness Evaluation:

1. Atmospheric Hg(0), rainfall, THg isotopes
2. Biomonitoring:
- Tuna THg isotopes
- Bivalve THg isotopes
- Human hair THg isotopes
3. River dissolved and particulate Hg isotopes (integrated watershed Hg release)
4. Hg Hotspots, e.g. river sediment, atmospheric PBM monitoring

Kwon et al., 2018, EarthScRev