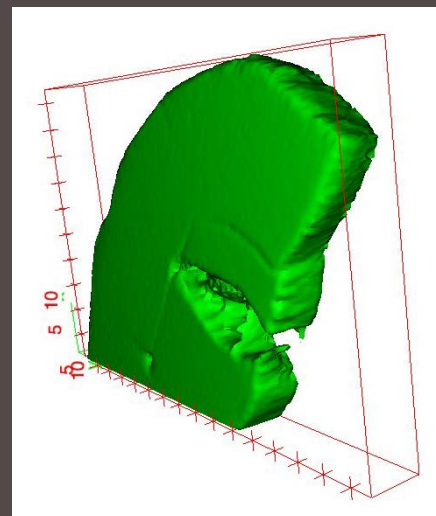
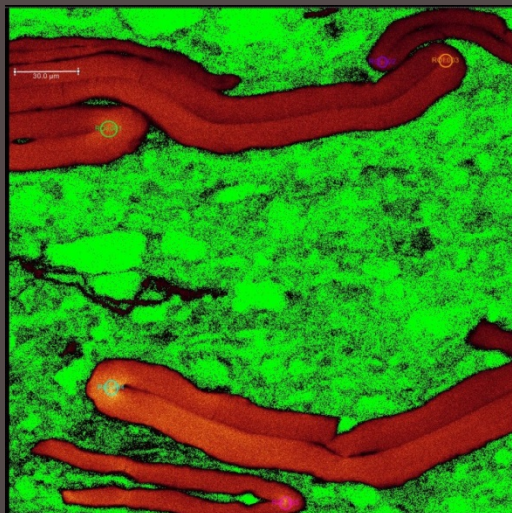


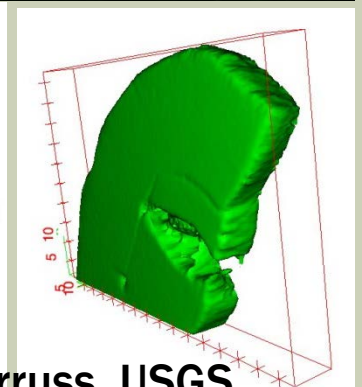
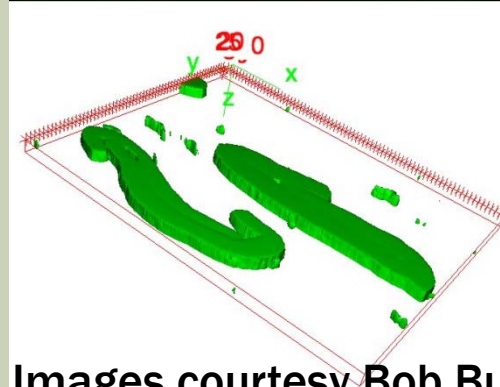
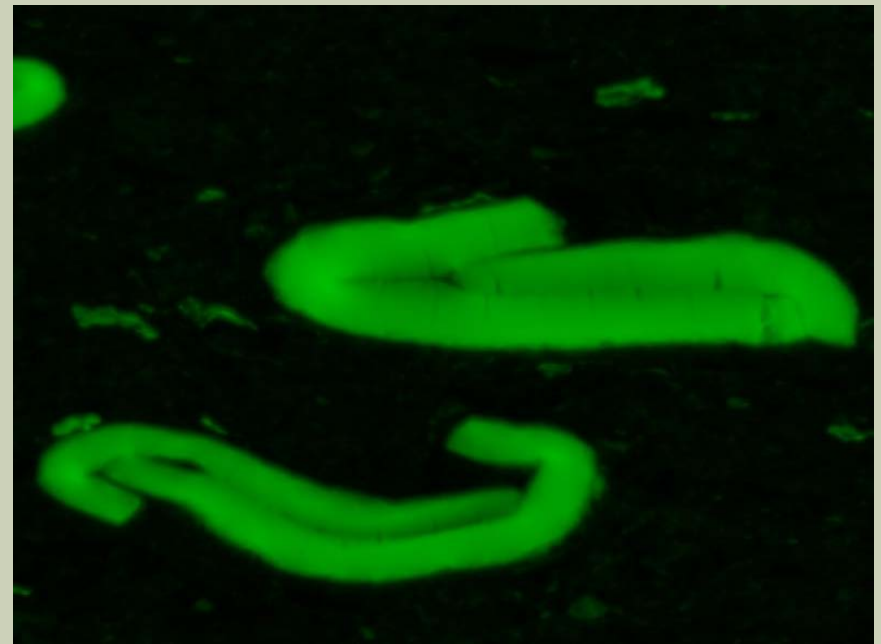
# CONFOCAL LASER SCANNING MICROSCOPY (CLSM) WORKING GROUP 2016

Paul C. Hackley  
Jolanta Kus



# WHY USE CLSM ON SEDIMENTARY ORGANIC MATTER?

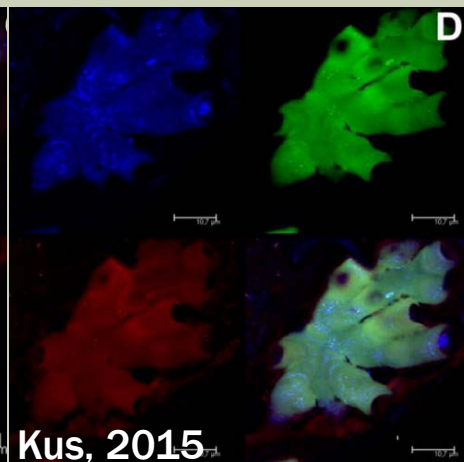
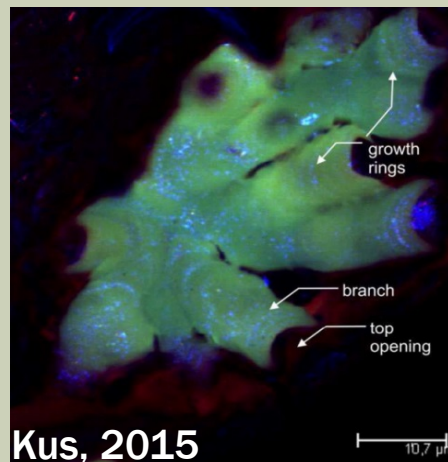
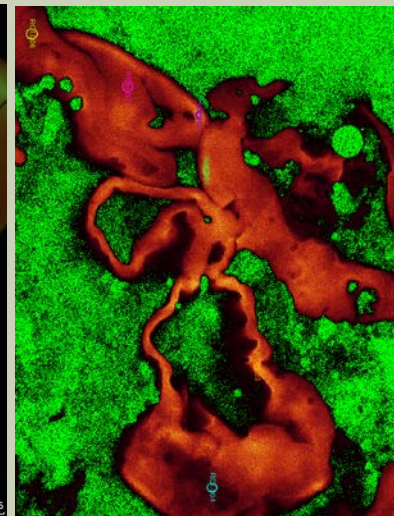
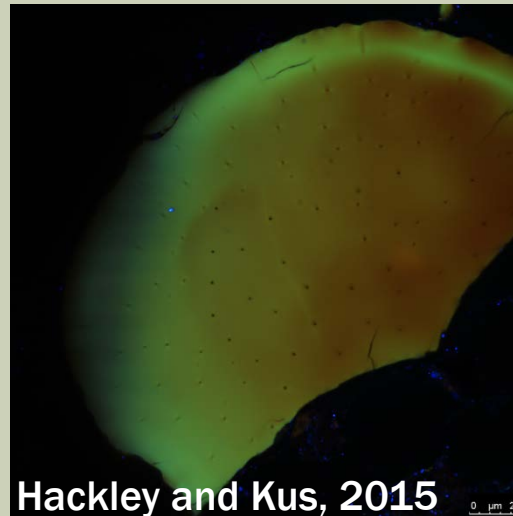
- ❑ Many applications
- ❑ Technique is broadly underutilized
- ❑ High resolution (~200 nm)
- ❑ 2-D and 3-D imaging
- ❑ 3-D reconstructions, video
- ❑ Non-destructive
- ❑ Fluorescence spectroscopy



Images courtesy Bob Burruss, USGS

# CLSM WG UPDATE 2016

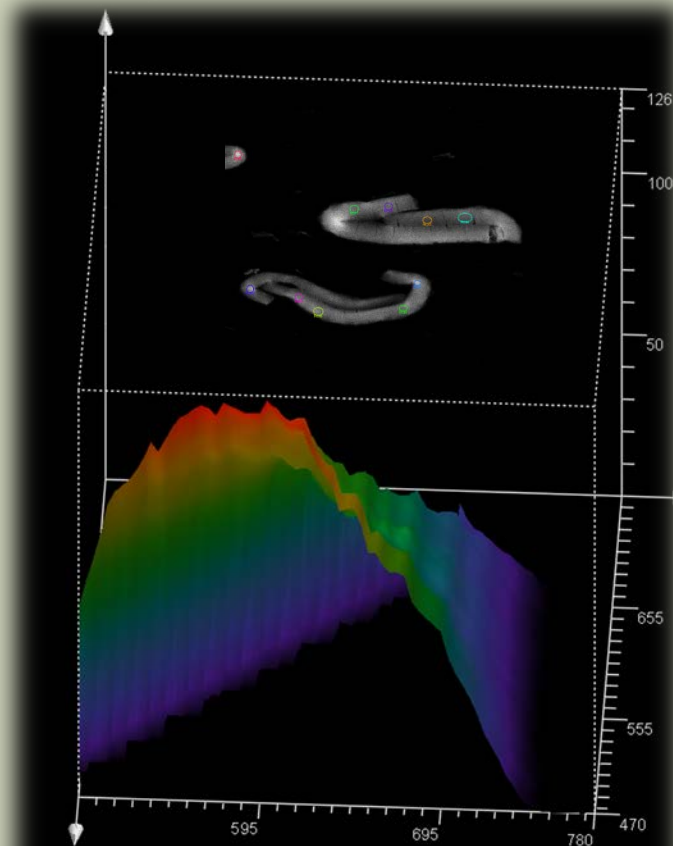
- Working Group approved in Potsdam 2015
- Note in ICCP News 63
- Presentation at GSA, Baltimore Nov 2015
- User survey sent Feb 2016



# CLSM SURVEY

Three Questions sent by email:

- 1. Access: Yes or No
- 2. If yes, describe the instrument
- 3. What applications are you interested in?

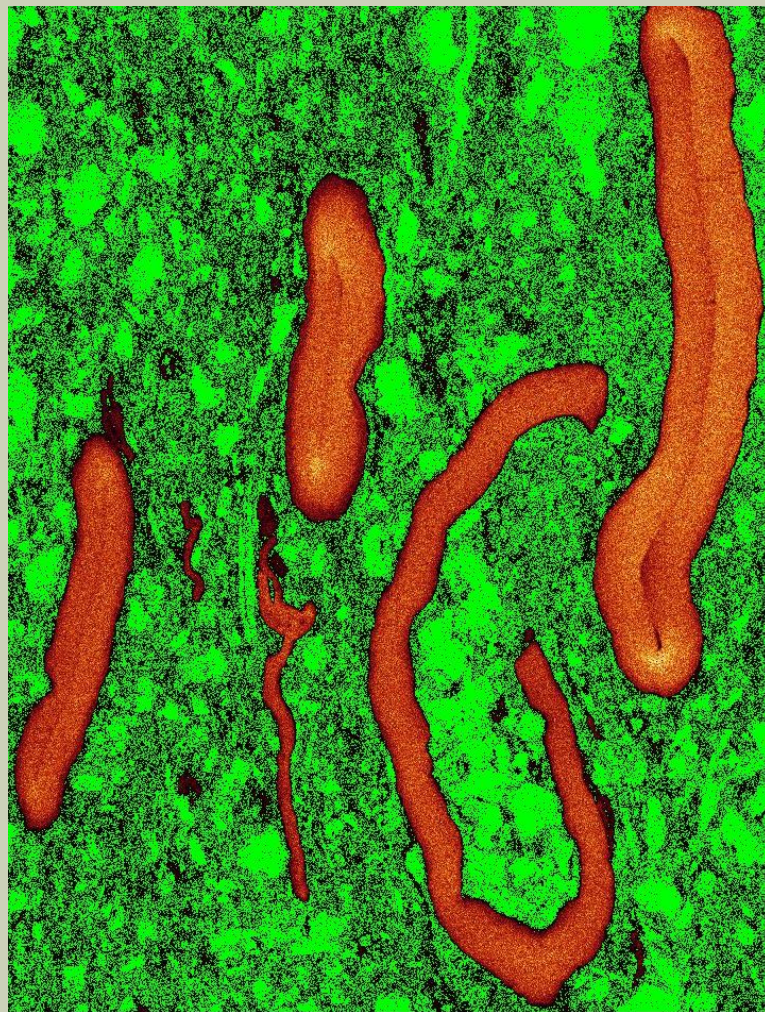




# CLSM SURVEY RESULTS

## Instrument Access:

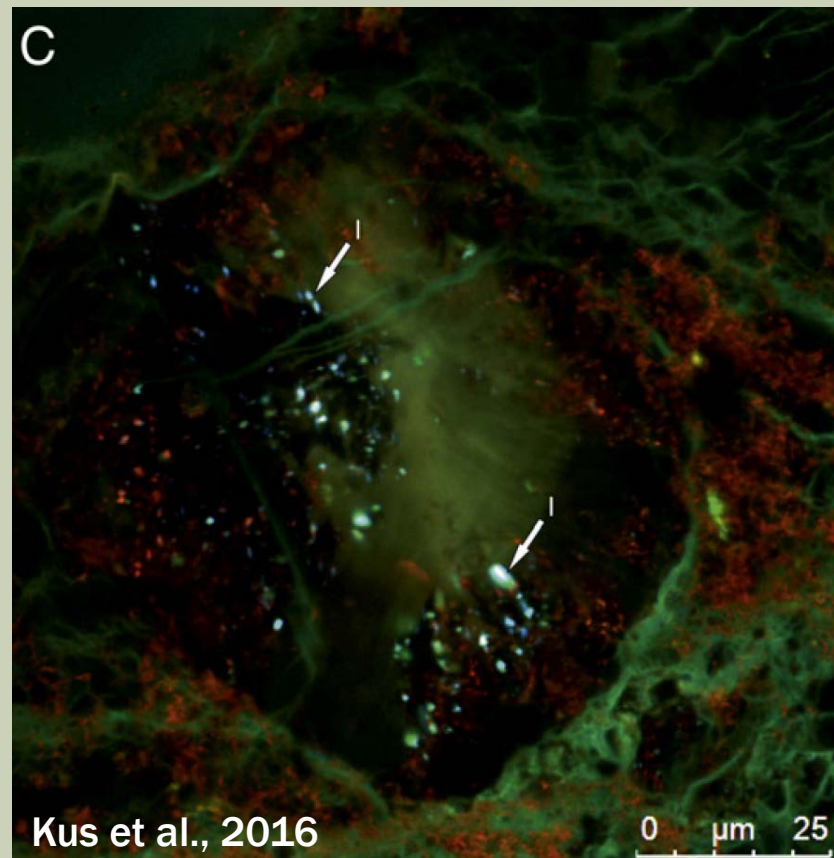
- No (4)
- Yes (7): Dragana Zivotic (Univ. Belgrade), Jolanta Kus (BGR), Marc Curtis (Univ. OK), Bill Schopf (UCLA), Paul Hackley (USGS), Joao Graciano (UFRJ), Angeles Borrego (INCAR)
- Maybe: Katrin Ruckwied (Shell)



# CLSM SURVEY RESULTS

## Instruments:

- Keyence VK-X200 series (Curtis)
- Leica DMI 6000 CS Bino (Kus)
- Leica SP2 inverted (Zivotic)
- OLYMPUS FluoView FV300 (Schopf)
- Leica SP5 X Confocal (Hackley)



# CLSM SURVEY RESULTS

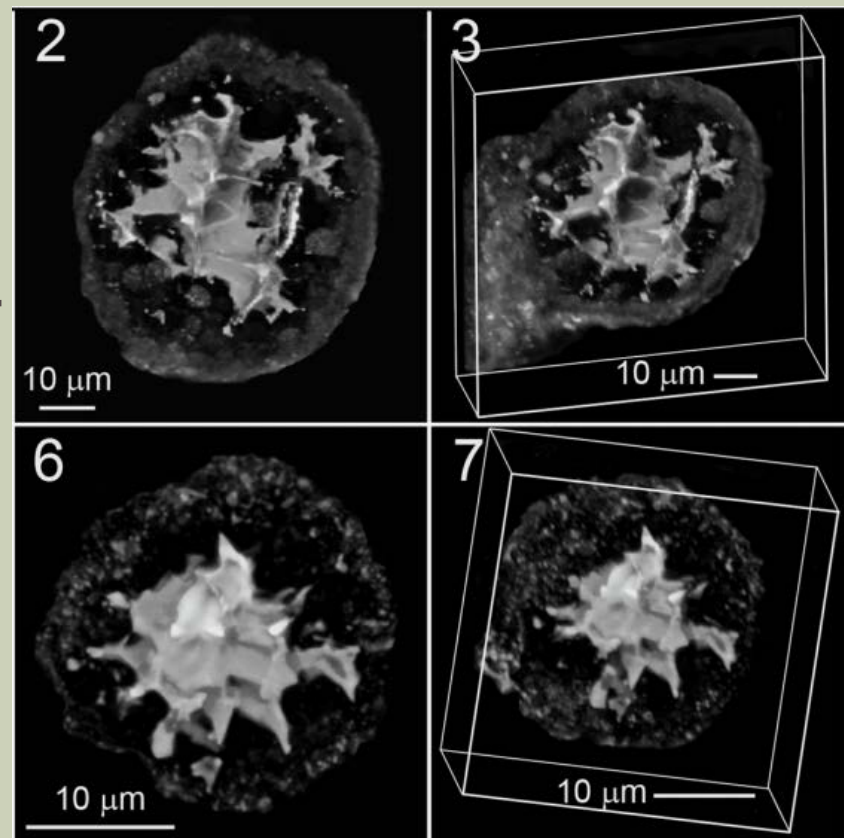
## Applications:

### ■ Imaging:

- Artificial fracture networks
- Proppant embedment
- 3-D sedimentary organic matter
- Sub-microscopic identification
- 3-D distribution oil inclusions
- Cellular morphology

### ■ Spectroscopy

- Characterization of macerals
- Thermal maturity probe
- Relation to composition and structure



Schopf et al., 2015



# CLSM WG 2016 SUMMARY

## Summary:

- We know the instruments available
- We know who the people are
- We know the applications in sedimentary organic matter
- We have established a Working Group

## Next Step(s):

- Summary for ICCP News
- Decide on study objectives

Schopf et al., 2010

