

# Treaty Law in Support of Climate Monitoring

Prof. Dr. Frans G. von der Dunk

University of Nebraska-Lincoln, College of Law

## 1. Introduction

The other papers presented at the present IISL-ECSL Symposium have all offered extended and detailed elaborations on various aspects of climate change monitoring and efforts to combat it, with a view *inter alia* to their legal aspects and parameters. The present paper, following upon the heels of those, presents an effort to tie some of the strands developed in the course of the two sessions of the symposium together.

Thus, it takes a bird's eye view of the contribution treaty law as the most specific source of international law available<sup>1</sup> can make to efforts to solve or mitigate this crucially important problem, in particular – with a view to the context offered by the symposium as part of the opening sessions of the Legal Subcommittee of UNCOPUOS –

---

<sup>1</sup>. Famously, the International Court of Justice (ICJ) is charged to solve disputes between states by basing itself on the sources of international law as enumerated by its Statute (Statute of the International Court of Justice, San Francisco, done 26 June 1945, entered into force 24 October 1945; 156 UNTS 77; USTS 993; 59 Stat. 1031; UKTS 1946 No. 67; ATS 1945 No. 1); Art. 38(1) pointing to “international conventions, whether general or particular, establishing rules expressly recognized by the contesting states” as the first of such sources. This clause in the ICJ's Statute, which is an integral part of the United Nations Charter (Charter of the United Nations, San Francisco, done 26 June 1945, entered into force 24 October 1945; USTS 993; 24 UST 2225; 59 Stat. 1031; 145 UKTS 805; UKTS 1946 No. 67; Cmd. 6666 & 6711; CTS 1945 No. 7; ATS 1945 No. 1), has since been commonly understood as stating, indeed, the sources of international law also outside of the specific setting of an ICJ case, even if later developments in international law may have led to additional sources being recognised.

focusing on the benefits that remote sensing<sup>2</sup> and other attendant uses of space technology<sup>3</sup> could bring to such an effort.

The task facing the international law-making community in this respect was aptly summarised by Dr. K. Kasturirangan, former Head of the Indian Space Research Organisation (ISRO): “Thus, the great challenge is to develop this space-web for (...) bringing more clarity to inputs on measurements and international treaties and conventions, thus bringing in transparency to global climate

---

<sup>2</sup>. It should be noted that in writings the terms “remote sensing” and “earth observation” are often used interchangeably, alternatively the latter term is used by others to refer to a somewhat narrower version of the former, focusing on ‘the earth’ and leaving out observation of the skies and perhaps even the oceans (separately headed “meteorology” in many cases). For those reasons, the term “remote sensing” is used in the current paper, as it may indeed be the comprehensive use of space remote sensing technology for monitoring any of those phenomena which may contribute to the monitoring and, thereby, mitigation of climate change. Cf. already M. Ferrazzani, *The Status of Satellite Remote Sensing in International Treaties*, in *Project 2001 – Legal Framework for the Commercial Use of Outer Space* (2002), 179; C.Q. Christol, *Remote Sensing in an Era of Global Warming*, *Proceedings of the Fiftieth Colloquium on the Law of Outer Space* (2008), 405-10.

<sup>3</sup>. Though the focus is, and should be, on remote sensing technology as referred to *supra*, n. 2, it should be noted that space technologies increasingly become mixed, e.g. for effective use of remote sensing data telecommunications, including satellite communications, is indispensable, and the value of such data is enormously enhanced by attendant usage of satellite positioning systems such as the US GPS.

convention management.”<sup>4</sup> Since treaties and conventions have the specific advantage over other sources of international law of being on the face of it clear, or at least less ambiguous and debatable than for example customary international law, their specific benefit here might well be to ensure that such “inputs” and “measurements” are more easily and formally accepted.

From such a bird’s eye perspective then, four closely interlinked aspects seem to be key: (1) treaties should somehow include, at least from the theoretical vantage point, a dedicated and specialised dispute settlement system in one form from another; (2) treaties should include references to satellite data as tools for monitoring; (3) as following from the foregoing an effort should be made through relevant treaties to somehow guarantee the authenticity of satellite data for the intended purposes; and (4) in order *inter alia* to support the previous points treaties should include, as clearly as possible, quantifiable and measurable parameters upon which to base decisions as regarding the violation of treaty obligations and the appropriate measures to take. I will address each of those four aspects in somewhat more detail.

## **2. Include appropriate dispute settlement clauses in climate change conventions**

The main problem in the application or establishment of any system of settlement of disputes over interpretation, application and/or perceived violation of obligations under treaties with respect to climate change concerns the technical complexities involved in climate change – both legally and otherwise.

<sup>4</sup>. K. Kasturirangan, Space technology for humanity: A profile for the coming 50 years, 23 *Space Policy* (2007), 162-3.

Effectively therefore, the dispute settlement system needs to be tailor-made for the cause. This makes reference to existing courts and tribunals, which are either of a general nature or focused on a different area of international law and activities, less obvious, and possibly even counter-productive.

Climate change issues are not unique in this sense, however, and there have been other areas where the subject matter was considered to be specialised enough to warrant the establishment of separate, specialised judicial structures. Consequently, it would be worthwhile for further studies on climate change treaty development to review and analyse some of those precedents.

A first example thereof that comes to mind is the International Tribunal for the Law of the Sea<sup>5</sup>, as this “Tribunal shall be composed of a body of 21 independent members, elected from among persons enjoying the highest reputation for fairness and integrity and of *recognized competence in the field of the law of the sea.*”<sup>6</sup>

Similarly, the Statute of the International Court of Justice allows for the possibility for parties to a dispute to have that dispute settled by a special chamber, formally subject to the authority of the Court. Thus, chambers of a more permanent character may be formed “for dealing with particular categories of cases”, specific examples referred to being “labour cases and cases relating to transit and communications”.<sup>7</sup> The

<sup>5</sup>. See Artt. 186-191, 285, also Annex VI, United Nations Convention on the Law of the Sea, Montego Bay, done 10 December 1982, entered into force 16 November 1994; 1833 UNTS 3 & 1835 UNTS 261; UKTS 1999 No. 81; Cmnd. 8941; ATS 1994 No. 31; 21 ILM 1261 (1982).

<sup>6</sup>. Art. 2(1), Annex VI, United Nations Convention on the Law of the Sea (emphasis added).

<sup>7</sup>. Art. 26(1), Statute of the International Court of Justice.

idea behind this was to have those judges on the Court with specific knowledge of the non-legal aspects of a specialised subject matter adjudicate relevant cases. In addition, the possibility of using the instrument of *ad hoc* chambers is also offered: “The Court may at any time form a chamber for dealing with a particular case”, an option which again can be used amongst others to allow substantive specialists on the Court to adjudicate a relevant case.<sup>8</sup>

The area closest to climate change in terms of subject matter, if not actually and effectively (at least under some definitions) encompassing climate change itself, obviously is that of environmental protection broadly speaking. Here, as a matter of fact, many interesting precedents may be found, worthy of further scrutiny.<sup>9</sup>

One interesting example on a national level for instance is offered by the case of India, where the Supreme Court of India has established a Central Empowered Committee in order to deal with the technical intricacies of the 1980 Forest Conservation Act in terms of the admissibility as evidence of certain satellite data in court.<sup>10</sup> Other examples refer to the United States and Australia (Queensland in particular).<sup>11</sup>

<sup>8</sup>. Art. 26(2), Statute of the International Court of Justice.

<sup>9</sup>. Cf. N. Peter, The Use of Remote Sensing to Support the Application of Environmental Treaties, *Proceedings of the Forty-Sixth Colloquium on the Law of Outer Space* (2004), 74 ff.; M. Onoda, Monitoring Greenhouse Gases from Space and the Kyoto Protocol, *Proceedings of the Forty-Ninth Colloquium on the Law of Outer Space* (2007), 204 ff.

<sup>10</sup>. See R. Purdy, Satellites: A New Era for Environmental Compliance?, 3 *Journal for European Environmental Planning Law* (2006), 409, 412.

<sup>11</sup>. Cf. Purdy, 409, 411; and on the United States specifically H. Ginzky, Satellite Images as Evidence in Legal Proceedings Relating to

Of course, such national developments from the perspective of global climate change raise the question of desirability of (potentially widely varying) national judgements. Although it will perhaps be inevitable that certain countries take the lead in this respect (and such leadership is even to be lauded), at the end of the day we need a global system also in this respect, or more to the point a global framework within which national regulations and national dispute settlement systems may still have an important role to play – just not a completely independent one. And this in turn, of course, calls for an international treaty providing precisely for such a dispute settlement framework.

Also, in Europe in this regard once more the potential of harmonisation of national laws of the – now twenty-seven – member states of the European Union by means of EC law may be noted.<sup>12</sup> Indeed, the Union has since a decade and a half decisively moved into general environmental protection

---

the Environment – A US Perspective, 51 *Droit et Ville* (2001), 41-68.

<sup>12</sup>. The European Union was essentially created by means of the Treaty on European Union, Maastricht, done 7 February 1992, entered into force 1 November 1993; 31 ILM 247 (1992); OJ C 191/1 (1992); which *inter alia* incorporated the former EEC Treaty, now rechristened EC Treaty, properly speaking; see Treaty Establishing the European Community (Consolidated Version); OJ C 325/33 (2002). In particular the Treaty of Amsterdam (Treaty of Amsterdam Amending the Treaty on European Union, the Treaties Establishing the European Communities and Certain Related Acts), Amsterdam, done 2 October 1997, entered into force 1 May 1999; OJ C 340/73 (1997)) and the Treaty of Nice (Treaty of Nice amending the Treaty on European Union, the Treaties establishing the European Communities and certain related acts), Nice, done 26 February 2001, entered into force 1 February 2003; OJ C 80/1 (2001)) further amended both treaties, including some rearrangement and renumbering of Articles.

legislation, to ensure that for example economic motives of individual member states would not be allowed to undercut a high, and progressively higher, level of environmental protection throughout the Union.<sup>13</sup> Satellites, moreover, are indeed gradually becoming involved in that process.<sup>14</sup>

Further to this, at least as far as EC law is concerned an extended judicial dispute settlement system exists, spearheaded by the European Court of Justice (ECJ) and further comprising the Court of First Instance as well as, essentially, the comprehensive judicial systems of the member states, to address any violations of relevant law.<sup>15</sup> As a consequence, at least some down-to-earth environmental disputes have been adjudicated by the ECJ.

At the same time, whilst EC law contains a wide range of environment-related regulations, as yet none of them specifically refer to global climate change, meaning that the aforementioned judicial system can not yet be used for legal action and/or dispute settlement in relevant cases.<sup>16</sup> Also, the European case is no different from others in that the need for sufficient specialised know-how on climate change issues might not be sufficiently taken care of by this general system of adjudication. Even more importantly, also a Europe-wide effort falls short of the global one required. Still, the European case may serve as an interesting precedent for sovereign states accepting some measure of supranational adjudication on environmental issues.

<sup>13</sup>. See further e.g. R.H. Folsom, *Principles of European Union Law* (2005), 190-6, esp. 191.

<sup>14</sup>. Cf. Purdy, 408-9.

<sup>15</sup>. See Artt. 225-240, EC Treaty; cf. further Folsom, 70-93.

<sup>16</sup>. Jurisdiction of the ECJ by definition is limited to issues somehow – even if sometimes somewhat implicitly or indirectly – falling within the scope of EC law.

Finally, the Global Monitoring for Environment and Security (GMES) project, recently renamed Kopernikus, should be mentioned here.<sup>17</sup> It represents a concerted European effort, led by the European Commission on behalf of the European Union and the European Space Agency (ESA)<sup>18</sup>, to realise “an operational and autonomous European capability for global monitoring for environment and security” by 2008, involving satellites.<sup>19</sup> This capability in substance was to take the form of databases to be filled with relevant data, partly self-generated by the key GMES players, notably ESA and (likely) EUMETSAT<sup>20</sup>, which was

<sup>17</sup>. See Council Resolution on the launch of the initial period of global monitoring for environment and security (GMES), of 13 November 2001; OJ C 350/4 (2001); Communication from the Commission to the European Parliament and the Council – Global Monitoring for Environment and Security (GMES): Establishing a GMES capacity by 2008, COM(2004) 65 final, of 3 February 2004; Communication from the Commission to the Council and the European Parliament – Global Monitoring for Environment and Security (GMES): From Concept to Reality, COM(2005) 565 final, of 10 November 2005.

<sup>18</sup>. For ESA, GMES/Kopernikus comprises a set of activities undertaken as “optional activities” in accordance with Art. V(1.b), Convention for the Establishment of a European Space Agency (ESA Convention), Paris, done 30 May 1975, entered into force 30 October 1980; 14 ILM 864 (1975); *Space Law – Basic Legal Documents*, C.I.I. As a consequence of such characterisation, individual member states are entitled to opt out of those activities, and/or determine their individual levels of financial commitment to them; cf. also Art. XIII(2), ESA Convention.

<sup>19</sup>. Para. (3), Council Resolution of 13 November 2001.

<sup>20</sup>. EUMETSAT is the European Organization for the Exploitation of Meteorological Satellites established by the Convention for the Establishment of a European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), Geneva, done 24 May 1983, entered into force 19 June 1986; as amended 14 July 1994, entered into force 27 July 1994;

considered another major stakeholder even though not (so far) an ‘official’ partner in the project, partly generated from ‘outside providers’.

There can be little doubt about the comprehensiveness of the approach taken under GMES/Kopernikus as to what constitutes data relevant for environment and security, and its consequent contribution to climate monitoring: “GMES will provide the EU with a tool for participating in the international efforts (...) to strengthen the global climate observing system”<sup>21</sup>. Even GMES/Kopernikus, in spite of its broad scope and comprehensive character, however, does not in any way provide for a dispute settlement system itself. Once more, this testifies to the necessity to generate a first level of global dispute settlement mechanisms at the global level.

### 3. Include explicit references to satellite data in climate change conventions

In the above, reference was already made to GMES/Kopernikus, as amongst others crucially bent upon using satellite data (in addition to any other data considered useful for the purpose) for the purpose of combating climate change. More generally, of course also a ‘system’ such as the GEOSS, as ‘combining’ the various existing national and multi-national remote sensing systems, could play a role here.<sup>22</sup> As indicated, this raises the issue of the extent to which satellite data can become formally engaged and

acknowledged as helpful, in certain cases even indispensable, tools in that context.

Also here other areas of international law show interesting examples where such references to satellite data are already incorporated in major legal regimes. One early example concerns the so-called MARPOL Convention<sup>23</sup>, where an obligation is included for states parties to the Convention to “co-operate in the detection of violations and the enforcement of the provisions of the present Convention, *using all appropriate and practicable measures of detection and environmental monitoring*, adequate procedures for reporting and accumulation of evidence.”<sup>24</sup> Subsequent practice has shown that indeed satellites and satellite data were seen to be included in that rather comprehensive formulation, and have been used occasionally to build a case for violation of relevant rules on marine environmental pollution, such as most notably in the *Song San* case.<sup>25</sup>

Furthermore, with reference to the previously discussed issue of dispute settlement, it may be noted that the MARPOL Convention calls for any dispute as regarding its interpretation, including issues concerning the interpretation and/or validity of

<sup>23</sup>. International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 (MARPOL Convention as Modified), London, done 17 February 1978, entered into force 2 October 1983; ATS 1988, No. 29.

<sup>24</sup>. Art. 6(1), MARPOL Convention as Modified (emphasis added). Under Art. 17(b) furthermore, states parties are even encouraged to support “the supply of necessary equipment and facilities for reception and monitoring”. See further Purdy, 409; *Applications of Earth Observation to the legal sector*, Final Report, BNSC Sector Studies Programme, August 2001, para. 7.2.1.

<sup>25</sup>. Cf. e.g. N.J. Brehon, *L’Utilisation des Satellites d’Observation pour la Détection des Déballastages en Mer*, 51 *Droit et Ville* (2001), 102-3; Ferrazzani, 192.

Cmnd. 9483; Space Law – Basic Legal Documents, C.III.1; 44 ZLW 68 (1995).

<sup>21</sup>. Communication of 10 November 2005, 5.

<sup>22</sup>. The Global Earth Observation System of Systems (GEOSS) is a loosely formed group of major remote sensing players with the aim of enhancing the coherent contributions to global benefits to be derived from their respective satellite systems to global issues such as related to the environment – including global warming and climate change issues.

satellite data in any given case, “if settlement by negotiation between the Parties involved has not been possible, and if these Parties do not otherwise agree, be submitted upon request of any of them to arbitration as set out in Protocol II to the present Convention.”<sup>26</sup>

Another area where the potential to use satellites for verification purposes has already been addressed is that of disarmament and arms control. Most notably the (now defunct) ABM Treaty<sup>27</sup> of 1972 included a reference to non-interference with so-called ‘national technical means’ for verification of compliance of the parties to the treaty obligations, a clause widely agreed to include (national) satellites.<sup>28</sup>

From another angle, the International Court of Justice itself has already made use of satellite data in trying to solve boundary disputes – albeit with mixed success to the extent that the parties’ varying interpretations and conclusions could not be verified or falsified by the use of the data as such.<sup>29</sup>

Thus, whilst on the one hand the use of satellite data is slowly becoming more acceptable, on the other hand there does not seem to be a clear-cut and/or

widespread understanding on the side of the (rather dispersed) entities charged with monitoring – mostly, in any case, still the states parties to the treaty at issue themselves – of how, what and where satellites might or even should come into the picture with a view to their special advantages as compared to other monitoring means. There would seem to be sufficient reason to try and develop a more explicit and detailed system at the international level, for the time being perhaps developed as per individual treaty, for involving satellites in the task of monitoring treaty obligations of the parties.

By way of possible example, in the context of the European Union certain instruments of EC law authorise the use of satellite data for monitoring potential fraud in the case of farm subsidies, as well as fish catches with a view to quota limitations established under EC law.<sup>30</sup> This evolves from such legal instruments as Regulation 2371/2002<sup>31</sup>, Regulation 2244/2003<sup>32</sup>, and Regulation 796/2004<sup>33</sup>.

<sup>26</sup>. Art. 10, MARPOL Convention as Modified.

<sup>27</sup>. Agreement Between the United States of America and the Union of Socialist Soviet Republics on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty), Moscow, done 26 May 1972, entered into force 3 October 1972, no longer in effect 13 June 2002; TIAS 7503; 23 UST 3435.

<sup>28</sup>. See Art. XII(2), ABM Treaty. Further e.g. B. Cheng, Legal and commercial aspects of data gathering by remote sensing, *The Highways of Air and Outer Space Over Asia* (1992), 60-1; Ferrazzani, 188-9; S. Ushioda, Recent Developments in Multilateral Satellite Monitoring Systems, in *Issues in International Air and Space Law, and in Commercial Law* (1994), 387.

<sup>29</sup>. See e.g. Ferrazzani, 193-4; Purdy, 409-10, incl. n. 28; *Applications of Earth Observation to the legal sector*, paras. 8.3, 8.5.

<sup>30</sup>. Cf. e.g. Purdy, 408-9.

<sup>31</sup>. Council Regulation on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy, No. 2371/2002/EC, of 20 December 2002; OJ L 358/59 (2002); see Art. 23(3).

<sup>32</sup>. Commission Regulation laying down detailed provisions regarding satellite-based Vessel Monitoring Systems, No. 2244/2003/EC, of 18 December 2003; OJ L 333/17 (2003); see in particular Art. 4, providing for the requirement of “an operational satellite-tracking device installed on board” of Community ships subject to the regime.

<sup>33</sup>. Commission Regulation laying down detailed rules for the implementation of cross-compliance, modulation and the integrated administration and control system provided for in of Council Regulation (EC) No 1782/2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers, No. 796/2004/EC, of 21 April 2004;

#### 4. Certify the authenticity of satellite data in climate change conventions

The next step in any evolution of legal instruments and frameworks for maximising the benefits satellite remote sensing could bring to climate change monitoring activities, which has already been alluded to, inexorably moves into the realm of the future. It would lie in a very fundamental discussion on how such data would qualify as evidence in judiciary proceedings.<sup>34</sup> Such a discussion might arise in any adversarial context, but the scope and extent of it could considerably be limited in case, somehow, the credibility and reliability of satellite data could be established in an *a priori*, objective and legally underwritten fashion.

As the (limited extent of) research undertaken on this matter has shown, so far in fact such evaluation and valorisation of satellite data has indeed largely been a matter of adversary testing.<sup>35</sup> Apart from the fact that the few instances where satellite data have so far been actually used in court have mainly seen those data being used in conjunction with other – *in situ* – data to verify and validate preliminary conclusions drawn from satellite data, this means that both sides in a dispute are likely to contest such value by means of their own technical experts and ‘expert witnesses’.

---

OJ L 141/18 (2004); see in particular Art. 32(5.a).

<sup>34</sup>. See e.g. Ferrazzani, 191-4; and for the United States specifically, R.J. Rychlak, J.I. Gabrynowicz & R. Crowsey, Legal Certification of Digital Data: The Earth Resources Observation and Science Data Center Project, 23 *Journal of Space Law* (2007), 195-219.

<sup>35</sup>. Cf. e.g. R. Macrory & R. Purdy, The Use of Satellite Images as Evidence in Environmental Actions in Great Britain, 51 *Droit et Ville* (2001), 73-88; also Purdy, 410-1; Rychlak, Gabrynowicz & Crowsey, 198-202.

This may not altogether be a negative development, as over time it will certainly build a certain familiarity with, and understanding of, the value of satellite data, of what they can prove and what not, as well as of where they might be tempered with, on the part of the courts and arbitral tribunals, but this will be a long process – given the relative scarcity of cases involving satellite data, when compared example for instance to such recent ‘new’ types of evidence as faxes and e-mails.

Thus, there would seem to be a special interest in establishing an ‘audit trail’ system to certify authenticity,<sup>36</sup> in view of the highly-technical character of satellite data and their generation, the multiple processing going on from binary data to useful information<sup>37</sup> and the international character of most satellite operations – in many cases, satellite data necessary to help decide a

---

<sup>36</sup>. See already Macrory & Purdy, 81-4; Purdy, 411-2; *Applications of Earth Observation to the legal sector*, para. 4.5.1.

<sup>37</sup>. An interesting reference here would be to Principle I of the Principles Relating to Remote Sensing of the Earth from Outer Space, UNGA Res. 41/65, of 3 December 1986; UN Doc. A/AC.105/572/Rev.1, at 43; 25 ILM 1334 (1986); generally considered to contain customary law; see e.g. Ferrazzani, 182. Principle I namely makes a threefold distinction between data generated by remote sensing satellites: “(b) The term “primary data” means those raw data that are acquired by remote sensors borne by a space object and that are transmitted or delivered to the ground from space by telemetry in the form of electromagnetic signals, by photographic film, magnetic tape or any other means; (c) The term “processed data” means the products resulting from the processing of the primary data, needed to make such data usable; (d) The term “analysed information” means the information resulting from the interpretation of processed data, inputs of data and knowledge from other sources”. This clearly indicates that already back in 1986 fundamental activities with regard to raw data such as ‘processing’ and ‘interpretation’ were necessary, were remote sensing satellites to deliver on their promises.

(legal) dispute may have to come from a jurisdiction quite different from the one where the dispute is being played out.

Taking into account the many differences that the special character of satellite operations and data bring with them, there are nevertheless interesting precedents that may serve as useful indicators of how to approach such an audit trail approach. Reference has been made already by a number of authors to such other new developments in the electronic area as automatic speed cameras – which may be especially valuable perhaps as illustrations, since remote sensing is basically also about cameras taking pictures, often in an automated mode.<sup>38</sup> Ultimately, scientific and technical experts may be called upon to help the lawyers in drafting the correct and feasible audit trails, but the call for development thereof should clearly emanate from the latter.

### 5. Insert quantifiable parameters into climate change conventions

That last remark also pertains to the final issue to be briefly addressed in this introductory paper on remote sensing satellites contributing to the monitoring and mitigation of climate change under appropriate treaty law. Quantifiable parameters should be included, wherever feasible, into any international treaties dealing with climate change issues, so as to allow a reasonably objective determination in specific cases as to whether a particular party has complied with the relevant obligations or not. Such quantification, obviously, cannot be achieved without substantial input from scientific and technical experts. Next, such parameters – from a procedural perspective – would best be

<sup>38</sup>. See e.g. R. Purdy & R. Macrory, *Satellite photographs: 21<sup>st</sup> Century evidence?*, *New Law Journal*, 7 March 2003, 338.

included in an annex or protocol to the primary treaty, yet forming an inseparable part thereof – much like in the field of frequency allocation the Radio Regulations, being constantly reshaped, form an inseparable and equally binding part of the international regime developed within the context of the International Telecommunication Union (ITU).<sup>39</sup> That way, regular updates of such parameters, as technology or other developments may require, may be provided for – by a body generally recognised to have the competence to do so within the treaty's framework. In the context of the ITU for example, that body is the Radio Regulations Board, consisting of individual experts

<sup>40</sup>.  
As mentioned, there is a major role to play in developing such a system for scientific experts, which makes one expect that the Scientific and Technical Sub-Committee of COPUOS would have to play a key role to play in this respect, perhaps assisted by the GEOSS platform and/or the GMES/Kopernikus programme.

### 6. Concluding remarks

It will be clear that a considerable amount of research would have to be

<sup>39</sup>. The ITU, since 1992, most fundamentally bases its competencies and activities upon two intergovernmental agreements, the Constitution of the International Telecommunication Union (ITU Constitution), Geneva, done 22 December 1992, entered into force 1 July 1994; 1825 UNTS 1; UKTS 1996 No. 24; Cm. 2539; ATS 1994 No. 28; Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992 (1993), at 1) and the Convention of the International Telecommunication Union (ITU Convention), Geneva, done 22 December 1992, entered into force 1 July 1994; 1825 UNTS 1; UKTS 1996 No. 24; Cm. 2539; ATS 1994 No. 28; Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992 (1993), at 71). See esp. Art. 4(3), ITU Constitution.

<sup>40</sup>. See Art. 14, ITU Constitution; Art. 10, ITU Convention.



undertaken in supporting, and where necessary further refining, the above set of four conclusions on what needs to be done to make satellite activities contribute (even) more to combating climate change through legal instruments, notably international treaties. Part of that research should be directed at a few precedents that, though not dealing with climate change strictly speaking, nevertheless may provide interesting clues to such further refinements.

In this context, mention should also be made of the research project of Columbia University that culminated in a workshop dealing with remote sensing in support of ecosystem management treaties and transboundary conservation.<sup>41</sup> Similarly, there is the major research project undertaken under the auspices of the University College of London that deals with satellite monitoring as a legal compliance tool in the environmental sector.<sup>42</sup> Somewhat more removed from the core topic, some interesting examples available for comparative analysis have already been mentioned, such as in the arms control and human rights areas, and the jurisprudence of such courts as the ICJ and the Supreme Court of India – but likely there would be more that are worthy of attention.

What should hopefully be clear is that treaties could be even more helpful as tools for combating climate change if they somehow (re)enforce the use of satellite earth observation data in such contexts, from monitoring to, in the end, enforcing compliance of relevant obligations and agreements.

---

<sup>41</sup>. See *Applications of Earth Observation to the legal sector*, para. 7.1.

<sup>42</sup>. See <http://www.ucl.ac.uk/laws/environment/satellites/index.shtml?aims>.