

# Global Operations Report

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## 1 Consortium Development

### 1.1 MOU

The revised iBOL Memorandum of Understanding was delivered to all iBOL partner nations following approval by the Executive Committee (August 22, 2011). Table 1 summarizes the progress towards completion of the MOUs. At the time of writing, eleven countries have either signed, or are close to signing the MOU, while a further nine are progressing towards full engagement in iBOL, albeit at a slower pace. Some of this second group have had difficulty in establishing a steering committee that can truly represent the spectrum of government agencies and funders, as well as scientists, that will collectively advance their node's interests and priorities within iBOL, while others have simply failed to provide up-to-date node profile information which tracks the strategic priorities, participating institutions and funding status of the node. A further nine countries have not been able to make significant progress towards participation as nodes in iBOL.

### 1.2 Contributions to the Barcode Library

It is noteworthy that the countries which are most advanced in their organization as nodes are not necessarily the most active contributors to the barcode library (Table 1). Individual scientists, some of whom may not even be aware of iBOL's structure in their country, continue to contribute material and data through the Guelph core facility, availing of its "free sequencing" services according to their own priorities. As barcoding capacity at Guelph becomes a limiting factor, it will be important to align individual priorities with those of the nodes and working group that they represent.

Table 1: Status and performance of iBOL's twenty-nine Nodes.

Group	Country	iBOL Board Member	iBOL SSC Rep	iBOL SSC Alternate	Node Coordinator	Node Steering Committee	Node Profile 2010-11	Node Profile 2011-12	MOU ready	# People	Barcodes produced
A	Australia		Andrew Mitchell	Andrew Lowe		✓	✓	✓	✓	11	16,951
	Brazil		Eduardo Eizirik	Fabricio Santos	Claudio Oliveira	✓	✓	✓	✓	7	2,434
	Finland		Marko Mutanen	Helena Korpelainen	Marko Mutanen	✓	✓	✓	✓	2	11,063
	Germany		Wolfgang Waegele	Axel Hausmann		✓	✓	✓	✓	22	49,561
	South Africa	Rocky Skeef	Michelle Hamer	Paul Skelton	Michelle Hamer	✓	✓	✓	✓	11	11,111
	Argentina	Faustino Sineriz	Pablo Tubaro	Juan Diaz de Astarloa		✓	✓	✓	0	5	2,704
	Russia		Yuri Kartavtsev	Natalia Abramson		✓	✓	✓	0	12	2,659
	Costa Rica		Dan Janzen	Jesus Ugalde		0	✓	✓	✓	-	-
	Netherlands		Pedro Crous	Freek Bakker	Lorenzo Lombard	✓	0	✓	✓	3	1,654
	Norway	Ivar Myklebust	Jan Lifjeld	Torbjorn Ekrem		✓	✓	0	✓	7	1,613
Kenya		Daniel Masiga	Helida Oyieke		0	✓	✓	✓	1	456	
B	Canada	Karl Tibelius	Vacant	Vacant	Bob Hanner	✓	✓	0	0	95	250,642
	China	Xian-EnZhang	Ya-PingZhang	Da-Wei Huang	Wen-Zhi Wang	✓	0	✓	0	2	1,424
	Colombia		Mauricio Linares	Silvia Restrepo	Maily Gonzalez	✓	✓	0	0	-	-
	France		Jean-Yves Rasplus	Line Le Gall		✓	0	✓	0	16	15,919
	Madagascar		Brian Fisher	Rajemison Balsama		0	0	✓	✓	-	-
	Mexico	Vacant	Manuel Elias-Gutierrez	Patricia Escalante		✓	✓	0	0	15	13,907
	New Zealand		Ian Hogg	Peter Smith		✓	✓	0	0	3	931
	United Kingdom		Pete Hollingsworth	Alfried Vogler		✓	✓	0	0	8	2,200
	Portugal		Filipe Costa	Cristiane Bastos-Silveira		0	✓	0	✓	2	145
C	Korea		Won Kim	Chang-Bae Kim		0	0	✓	0	-	-
	European Union <sup>1</sup>		Pedro Crous		Lorenzo Lombard	✓	0	0	0	60	83,566
	India		Wazir Lakra	Gulab Khedkar		0	0	0	0	-	-
	Panama		Eldredge Bermingham	Oris Sanjur		0	0	0	0	-	-
	Papua New Guinea		Amanda Mararuai	Scott Miller	Amanda Mararuai	0	0	0	0	-	-
	Peru		Thomas Valqui	Gisella Orjeda		0	0	0	0	1	551
	Saudi Arabia		Yousef Al-Hafedh			0	0	0	0	-	-
	Spain		Arnedo	Carranza		0	0	0	0	7	3,024
United States	Jesse Ausubel	George Amato	Keith Crandall		0	0	0	0	55	78,173	

<sup>1</sup> Calculated as the total of contributions from Finland, Germany, Netherlands, France, United Kingdom, Portugal, and Spain

### 1.3 Performance against targets

With the exception of Canada, Germany and USA (where specimen contributions are high due to the stellar contribution of three individuals), iBOL's Nodes are falling well short of the targets set for National, Regional, and Central Nodes (Figure 1). Most global barcoding efforts emphasize the orders Lepidoptera, Hymenoptera and Diptera.

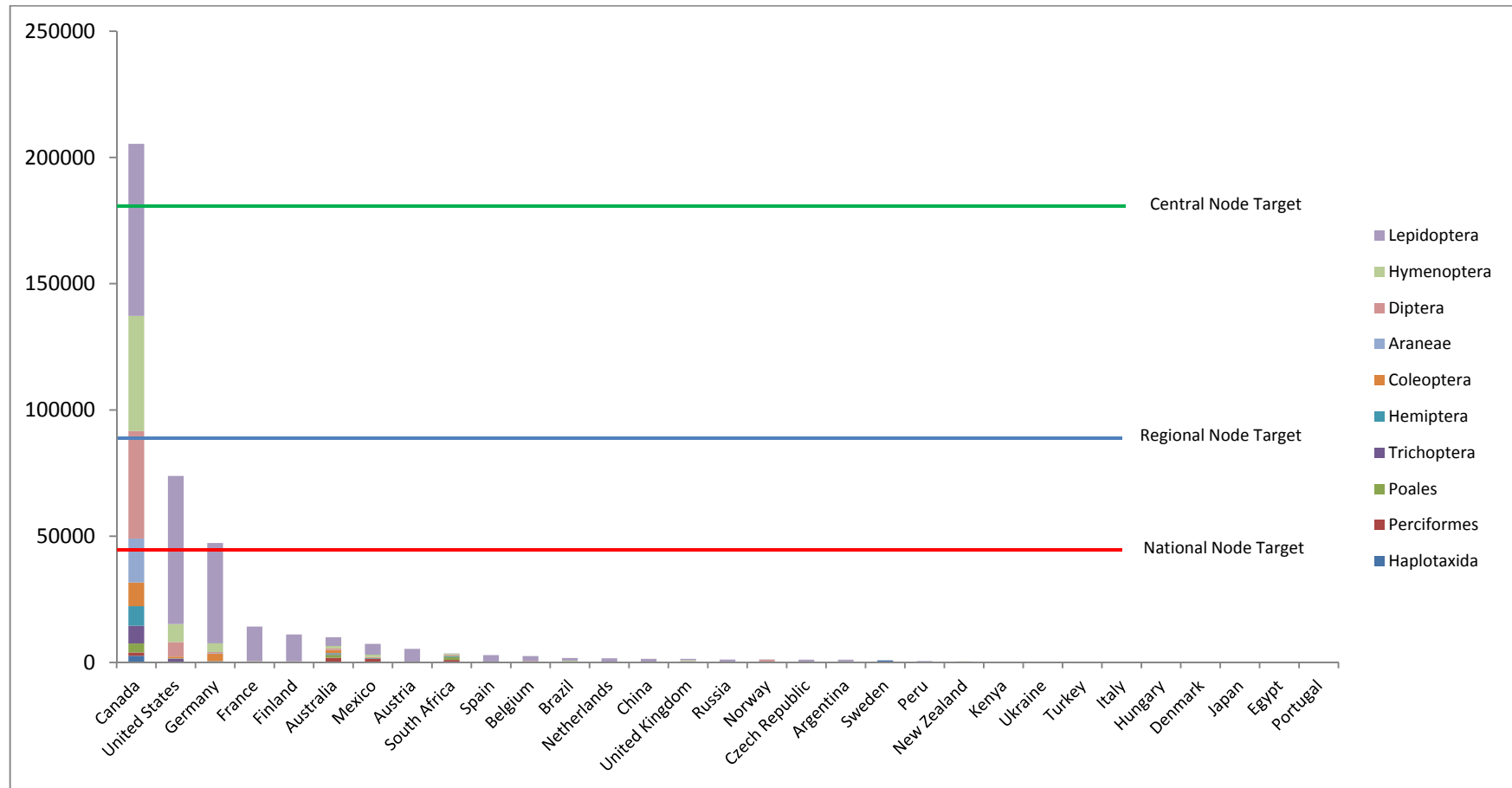


Figure 1: Barcode production by country for the first 2.25 years of iBOL, relative to the barcode targets for National, Regional, and Central Nodes. Note that three countries (Canada, United States, and Germany) are responsible for the majority of records.

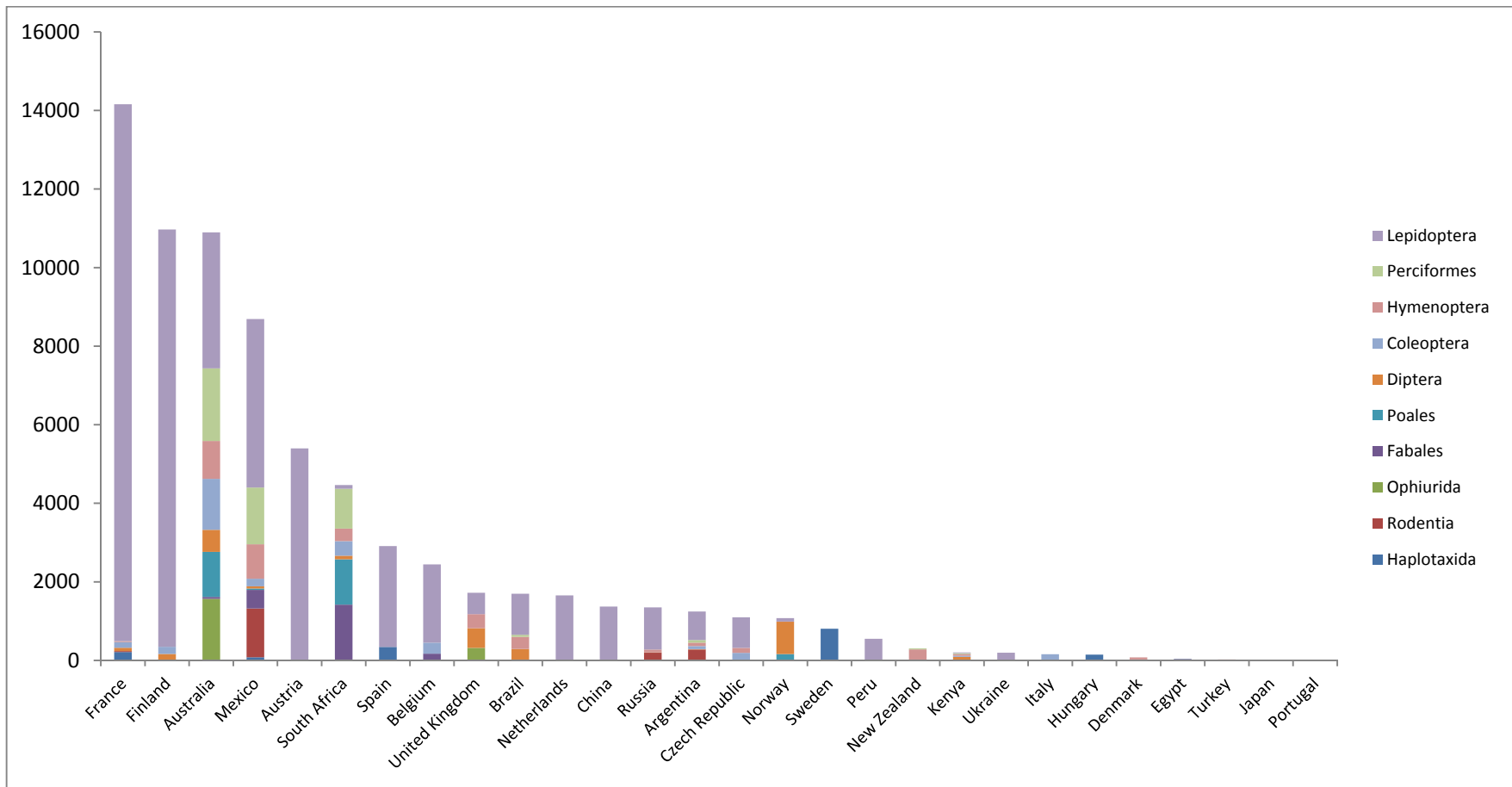


Figure 2: Excluding Canada, United States, and Germany (cf Figure 1) allows the details of the remaining Nodes to be seen.

## 2 Analytical Pipeline

### 2.1 Summary of iBOL Records as of end of Q9 (Sept 30, 2011)

Table 2 presents statistics on barcode production and data release, by working group, in the following categories:

- **iBOL records (~575,000):** iBOL records represent less than half of the total records on the BOLD workbench (~1.3 million)
- **Records with BINS (~531,000):** These records are publicly available in the BOLD workbench (Q9 data) and the GenBank archive (up to Q8)
- **Records with at least tentative species ID:** ~48,000 records are publicly accessible on both BOLD and GenBank
- **Records with taxonomically validated species ID (~35,000):** All of these records are in the public domain.

Table 2: Summary of iBOL data release statistics

Working Group	All BOLD records	Public on BOLD			
		iBOL-produced records	Records assigned to a BIN	Records with a tentative species ID	Records with a taxonomically validated species ID
No Working group	N/A	150	15		
WG1.1 – Vertebrates	N/A	31,206	30,475	-	5,108
WG1.2 - Land plants	N/A	31,120	-	-	1,060
WG1.3 - Fungi	N/A			-	
WG1.4 - Human Pathogens	N/A	6,898	6,610	-	52
WG1.5 - Pests & Parasitoids	N/A	50,891	49,600	3,526	2,069
WG1.6 - Pollinators	N/A	43,419	42,337	-	328
WG1.7 - Freshwater Life	N/A	26,421	24,646	-	1,512
WG1.8 - Marine Life	N/A	27,455	26,941	-	1,707
WG1.9 - Terrestrial Life	N/A	305,080	300,759	44,355	20,514
WG1.10 - Polar Life	N/A	50,110	49,594	-	2,940
<b>Total</b>	<b>1,271,105</b>	<b>572,750</b>	<b>530,977</b>	<b>47,881</b>	<b>35,290</b>

## 2.2 Contribution of BINS by iBOL Nodes and Working Groups

Table 3 shows the Q9 and cumulative contribution of BINS (published on BOLD's Data Release page) by each Node and each Working Group in Theme 1 (Barcode Library). Overall, the project has reached 23% of its 500,000 BINS target. Central Nodes are shown in green, Regional Nodes in blue, and National Nodes in red. Several non-iBOL countries (shown in black) have also contributed to the effort.

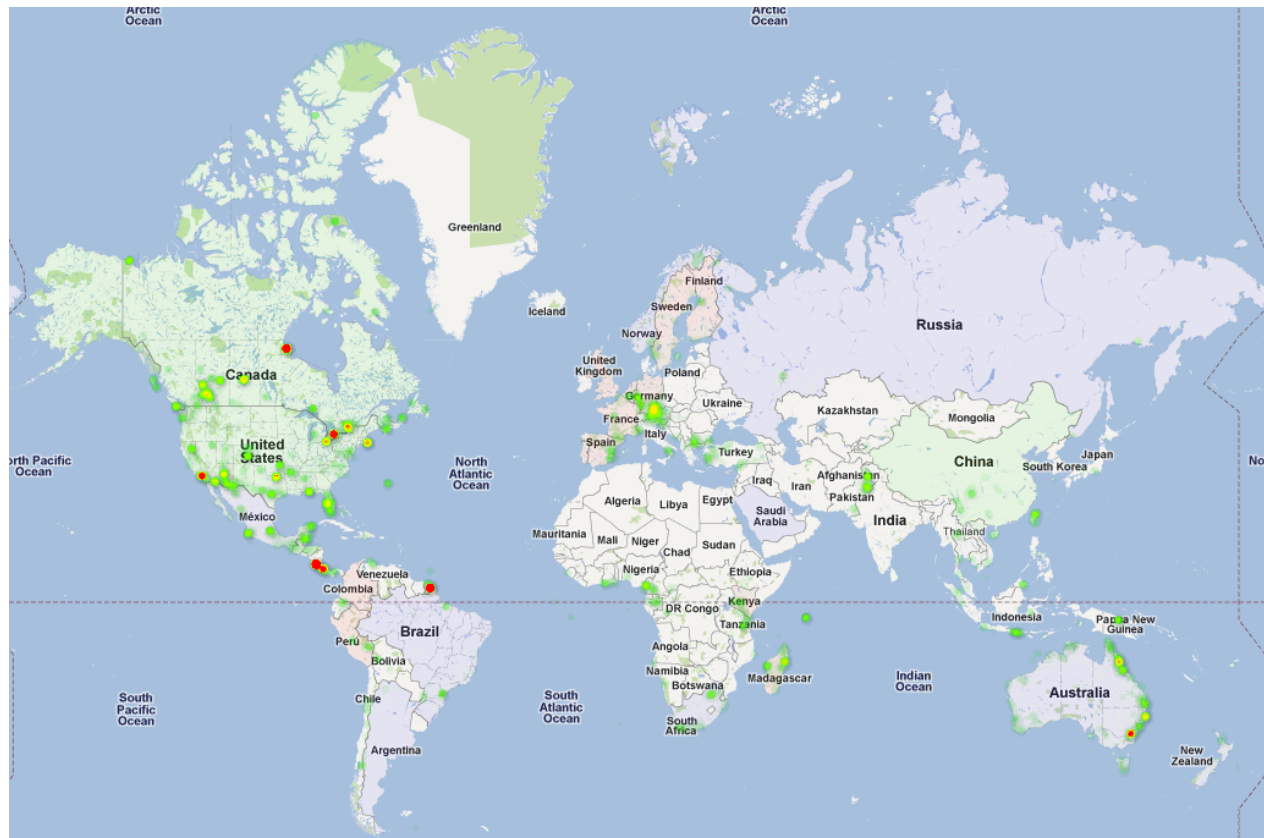
Table 3: Contribution of iBOL's Nodes to each of the Theme 1 Working Groups in Q9.

Node	WG1.1	WG1.2	WG1.3	WG1.4	WG1.5	WG1.6	WG1.7	WG1.8	WG1.9	WG1.10	Q9 Total	Cumulative
Argentina	115	0	0	4	82	19	0	0	184	0	404	757
Australia	151	0	0	9	118	92	111	46	354	8	889	4110
Austria	0	0	0	0	0	0	0	0	306	0	306	1618
Belgium	0	0	0	0	26	0	5	0	5	0	36	628
Brazil	0	0	0	0	0	13	54	0	70	0	137	743
Canada	101	1	0	70	2481	3101	453	784	4800	552	12343	53509
China	0	0	0	0	8	0	0	0	23	0	31	348
Colombia	0	0	0	0	0	0	0	0	0	0	0	0
Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	0	0	0	0	17	1	0	0	13	0	31	342
Denmark	0	0	0	7	20	12	2	0	0	0	41	41
Finland	0	0	0	0	37	3	0	0	142	2	184	1639
France	0	0	0	0	0	1	2	0	587	0	590	5648
French Guiana	0	0	0	0	0	0	0	0	0	0	0	6
Germany	98	0	0	2	225	278	46	137	1626	4	2416	17935
Hungary	0	0	0	0	0	0	0	12	0	0	12	69
Italy	0	0	0	0	0	0	0	0	0	0	0	94
Japan	0	0	0	0	15	0	0	0	0	0	15	20
Kenya	7	0	0	1	44	15	0	0	2	0	69	103
Korea	0	0	0	0	0	0	0	0	0	0	0	0
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	23
Madagascar	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	337	0	0	29	134	11	33	41	82	0	667	2683
Netherlands	0	0	0	0	0	0	0	0	91	0	91	1021
New Zealand	33	0	0	0	40	11	0	13	2	0	99	513
Norway	0	0	0	0	0	0	23	16	0	10	49	434
Pakistan	0	0	0	20	161	128	40	0	100	0	449	1352
Peru	0	0	0	0	0	0	0	0	0	0	0	48
Portugal	0	0	0	0	0	0	0	66	0	0	66	77
Russia	65	0	0	0	0	0	0	58	229	0	352	766
Saudi Arabia	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	235	0	0	0	25	46	2	58	151	0	517	1211
Spain	0	0	0	0	0	0	2	8	39	0	49	415
Sweden	0	0	0	0	0	0	0	2	1	0	3	162
Turkey	0	0	0	0	0	0	0	0	0	0	0	14
Ukraine	0	0	0	0	0	0	0	0	0	0	0	37
United Kingdom	4	0	0	28	7	0	0	17	1	0	57	549
United States	99	0	0	48	421	157	27	62	1809	1	2624	16540
(Unknown)	28	0	0	0	6	73	0	0	62	0	169	750
Q9 Total	1273	1	0	218	3867	3961	800	1320	10679	577	22696	114205
Cumulative	5955	1	0	600	15258	13265	5478	3167	65252	5229	114205	
Target (2015)	50000	100000	10000	10000	30000	35000	25000	70000	150000	20000	500000	
% Target (2015)	11.9%	0.0%	0.0%	6.0%	50.9%	37.9%	21.9%	4.5%	43.5%	26.1%	22.8%	

## 2.3 Source of specimens

For the statistics presented above, we have allocated barcodes to the country that is the source of the *effort* (i.e., funding) rather than the source of *collection*. For example, if a researcher from New Zealand obtains a grant to collect blackflies in Indonesia, these samples are counted as a New Zealand contribution, not as an Indonesian contribution. Nevertheless, it is important to recognize the contribution of *biodiversity* to iBOL by many nations around the world. An interactive map is available online at <http://ibol.org/heatmap/>.

Figure 3: Heatmap of collecting hotspots that have contributed to iBOL. The spectrum runs from green (light collecting activities) to red (heavy collecting activities). Countries have also been shaded according to their Node status (green=Central Node, blue=Regional Node, and red=National Node).



### 3 Dashboards

The second iteration of the quarterly Project Dashboards has been published. We have attempted to take into account the feedback we have received from iBOL participants, and will continue to refine these presentations in future quarters. There are three Dashboards giving different views of the Project.

#### 3.1 Project Dashboard – Working Group View (<http://ibol.org/project-dashboard-wg-view>)

Here, it is possible to see Working Group barcoding progress against milestones, and see which countries/people are contributing to the effort (Figure 4).

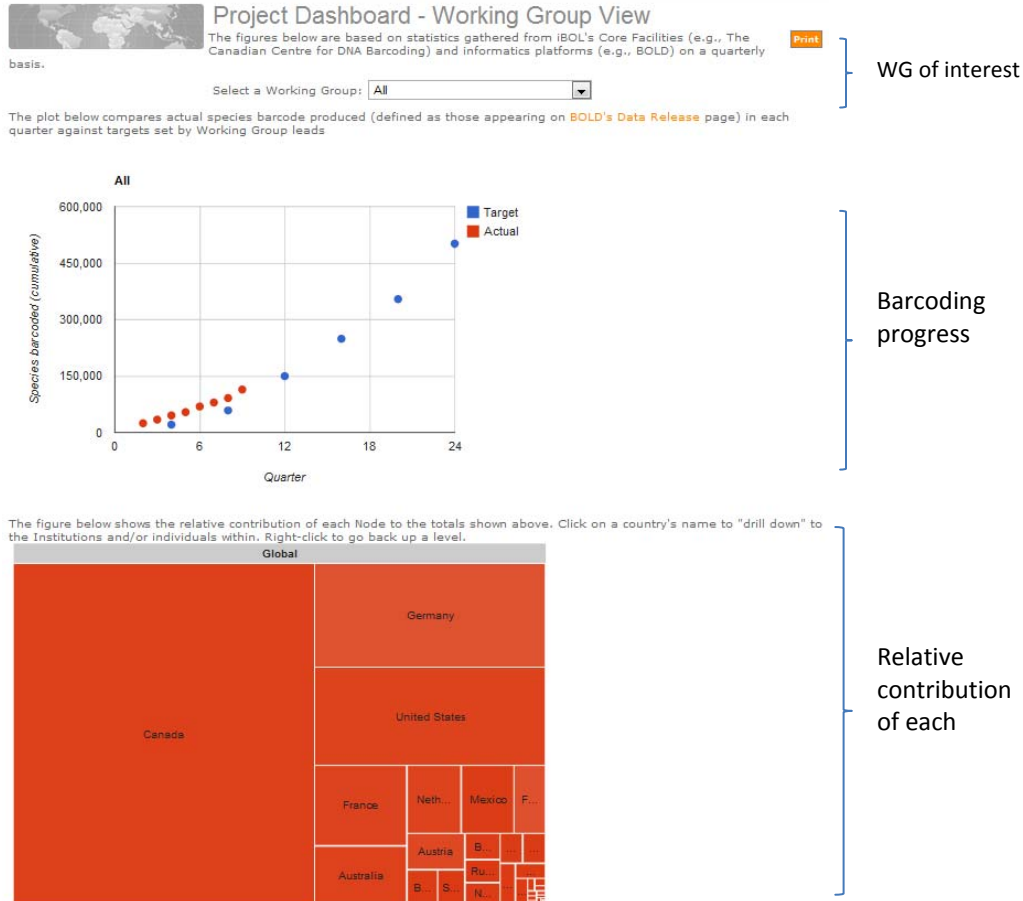


Figure 4: Project Dashboard – Working Group View, showing progress against targets and the relative contributions of each country

### 3.2 Project Dashboard – Node View (<http://ibol.org/project-dashboard-node-view>).

Here, one can see Node barcoding progress against milestones, and the taxonomic breakdown of the barcodes that have been produced (Figure 5).

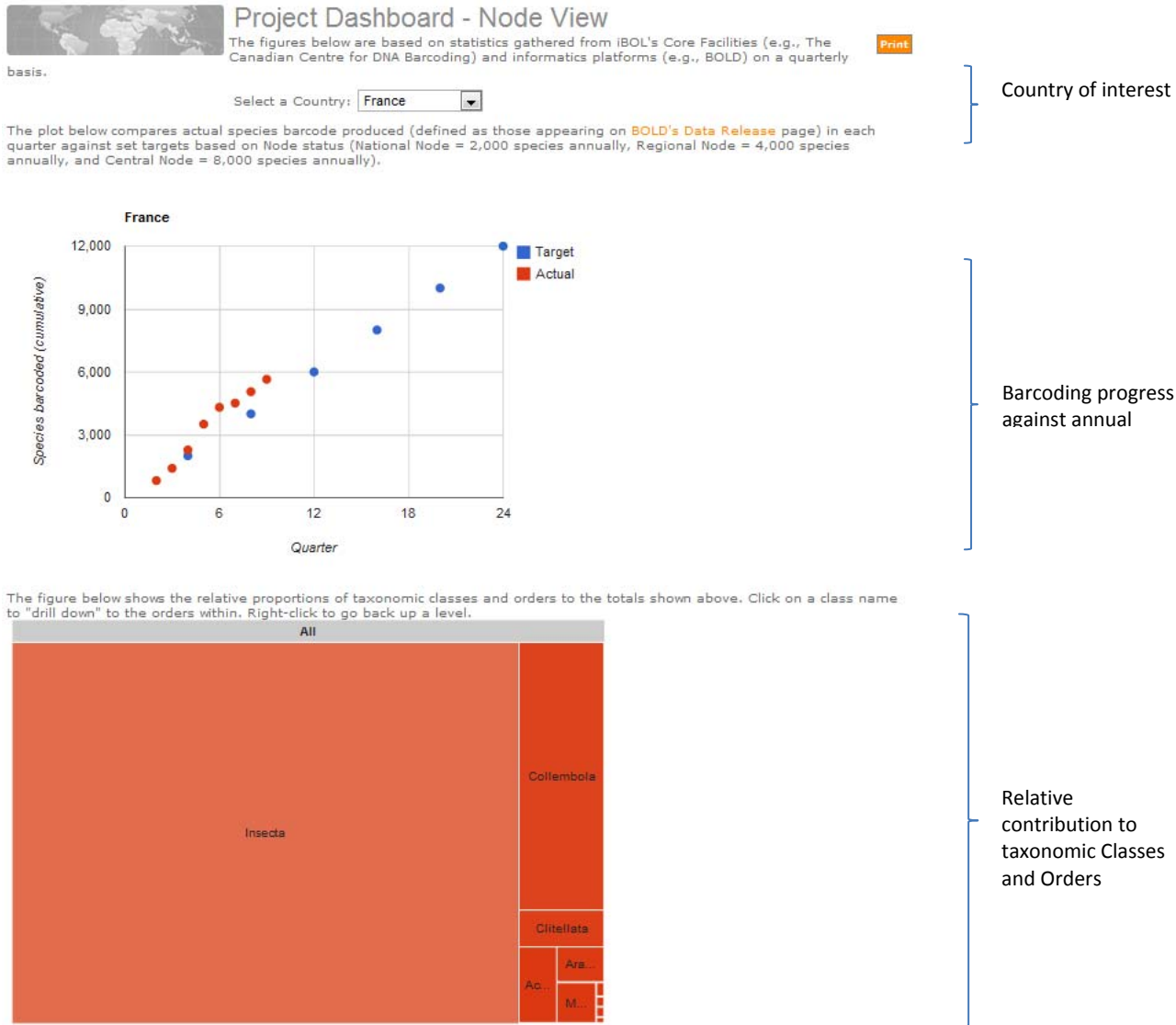


Figure 5: Project Dashboard – Node View, showing Node progress against targets and the relative contribution to each taxonomic class

### 3.3 Node and Working Group Dashboard ([http://ibol.org/node\\_wg\\_dashboard/](http://ibol.org/node_wg_dashboard/))

This dashboard is designed to give full information to node and working group leaders and participants (see Figure 6). Node leaders can see who (from their node) has contributed material (by taxonomy) and generated barcode records (BINS) in various working groups. Working group leaders can likewise see, and begin to proactively manage, the efforts of their participants in achieving project goals. Finally, users can see who has expressed interest in their nodes and working groups, in order to recruit further participants.

**Node & Working Group Dashboard**  
 This page is divided into three sections:  
 1. **Input (plate submissions)**  
 2. **Output (BINS in GenBank)**  
 3. **Potential Contributors**

Filter the results by choosing a Node and/or Working Group from the menus below:  
 Choose a Node: **Australia** Choose a Working Group: **WG1.9 - Terrestrial Biosurveillance**

**Input: plate submissions**  
 In the chart below, we show the individuals that have submitted bars of specimens to one of iBOL's Core Facilities (e.g., The Canadian Centre for DNA Barcoding). Hover the mouse pointer over the bars to see taxonomic information.

Person	Institution	Country	New BINS
Andrew Mitchell		Australia	624
Bob Ward		Australia	256
Chris Burridge		Australia	183
Graeme Cocks		Australia	129
Mark Stevens	South Australian Museum	Australia	82
Michelle Glover	CSIRO	Australia	8
You Ning Su		Australia	

**Output: BINS published on BOLD**  
 In the table below, we show the output (defined as public records on BOLD) created from the plates submitted above. Click on any of the column headers to re-sort the table. Countries are coloured according to whether they are Central Nodes (green), Regional Nodes (blue), National Nodes (red), or have no formal status (black).

**Summary: 6 people from 4 institutions from 1 countries produced 1282 BINS.**

Person	Institution	Country	New BINS
Graeme Cocks		Australia	624
Andrew Mitchell		Australia	256
Mark Stevens	South Australian Museum	Australia	183
Bob Ward	CSIRO	Australia	129
You Ning Su	Australian National Insect Collection	Australia	82
Michelle Glover	CSIRO	Australia	8

**Potential contributors**  
 This list comes from registration information on [Connect.BarcodeOfLife.net](http://Connect.BarcodeOfLife.net). These represent people who have indicated an interest in a particular Working Group, but may not have contributed to the Project yet. Click on any of the column headers to re-sort the table using that column.

Person	Institution	Country	WG
Andrew Mitchell	Australian Museum	Australia	WG1.9
Wolf Wanjura	CSIRO - Atlas of Living Australia	Australia	WG1.9
Nick Murphy	La Trobe University	Australia	WG1.9
Michael Bunce	Murdoch University	Australia	WG1.9
Mark Stevens	South Australian Museum	Australia	WG1.9
Stuart Donnellan	South Australian Museum	Australia	WG1.9

Figure 6: Node & Working Group Dashboard, showing who is contributing to (or interested in) each Working Group

## 4 Summary of iBOL funding

Table 5 shows cumulative funding (July 1<sup>st</sup>, 2009 through September 30<sup>th</sup>, 2011) from each of the Nodes in each of iBOL's Themes, as self-reported through the Node Profiles. A total of \$75 million has been spent since the project was started. Another \$75 million in confirmed funding remains to be spent through the end of the project, along with an additional \$27 million in anticipated funding.

**Table 4: Funding across iBOL's five themes in each of the Nodes.**

Node	Infrastructure	Theme 1 (DNA Barcode Library)	Theme 2 (Methods & Technologies)	Theme 3 (Informatics)	Theme 4 (GE3LS and Applications)	Theme 5 (Administration)	A: Confirmed funding (2009-2011)	B: Confirmed funding (2011-2015)	C: Anticipated funding (2011-2015)	Total (A+B+C)
Argentina	\$395,519	\$1,528,304			\$54,330		\$1,978,153	\$376,236	\$5,159,588	\$7,513,976
Australia		\$3,707,026	\$208,097				\$3,915,122	\$9,386,761		\$13,301,883
Brazil		\$846,166	\$43,882				\$890,048	\$2,218,146		\$3,108,194
Canada	\$10,181,633	\$14,982,922	\$168,000	\$1,186,192	\$166,728	\$500,183	\$27,185,657	\$22,523,238	\$16,400,000	\$66,108,895
China	\$23,276,839	\$3,537,871	\$164,574				\$26,979,284	\$14,250,456		\$41,229,740
Costa Rica		\$1,247,460					\$1,247,460	\$1,701,172		\$2,948,631
Finland									\$1,123,891	\$1,123,891
France		\$402,341					\$402,341	\$1,104,701		\$1,507,042
Germany	\$184,606	\$2,010,587				\$147,482	\$2,342,674	\$10,044,650		\$12,387,324
Kenya		\$102,945					\$102,945	\$47,055		\$150,000
Madagascar		\$124,412					\$124,412	\$147,507		\$271,919
Mexico		\$915,851		\$296,639			\$1,212,490	\$132,274		\$1,344,764
Netherlands	\$1,081,536	\$2,406,611					\$3,488,147	\$4,330,195		\$7,818,342
Norway		\$1,315,929					\$1,315,929	\$7,513,373	\$3,914,879	\$12,744,181
Pakistan		\$19,286					\$19,286		\$300,000	\$319,286
Russia		\$31,329					\$31,329	\$10,596		\$41,925
South Africa		\$204,865					\$204,865	\$360,629		\$565,494
United Kingdom		\$218,151	\$140,039				\$358,189	\$552,075		\$910,264
United States			\$1,704,901			\$1,698,753	\$3,403,655			\$3,403,655
<b>A: Confirmed funding (2009-2011)</b>	<b>\$35,120,132</b>	<b>\$33,602,055</b>	<b>\$2,429,493</b>	<b>\$1,482,831</b>	<b>\$221,057</b>	<b>\$2,346,418</b>	<b>\$75,201,986</b>			
<b>B: Confirmed funding (2011-2015)</b>	<b>\$20,531,581</b>	<b>\$46,550,013</b>	<b>\$932,710</b>	<b>\$5,871,616</b>	<b>\$138,271</b>	<b>\$674,870</b>		<b>\$74,699,062</b>		
<b>C: Anticipated funding (2011-2015)</b>	<b>\$889,917</b>	<b>\$18,171,741</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,324,062</b>	<b>\$6,512,638</b>			<b>\$26,898,359</b>	
<b>Total (A+B+C)</b>	<b>\$56,541,630</b>	<b>\$98,323,809</b>	<b>\$3,362,203</b>	<b>\$7,354,447</b>	<b>\$1,683,390</b>	<b>\$9,533,927</b>				<b>\$176,799,406</b>